ITEM 4

Paper No. WRWA 21-03

WESTERN RIVERSIDE WASTE AUTHORITY

MEETING	26th January 2020
REPORT AUTHOR/DATE	General Manager *(Contact Mark Broxup - Tel. 020 8871 2788)* 18th January 2020
SUBJECT	A Report outlining progress with operations and other matters since the previous meeting of the Authority.
CONTENTS	Page 1 Executive Summary Pages 1 to 10 Items reported on Page 10 Recommendation Pages 11- 21 Appendix A – Performance Monitoring Pages 22- 87 Appendix B – Interim Carbon Metric Report
STATUS	Open
BACKGROUND PAPERS	None

This page is left blank intentionally

EXECUTIVE SUMMARY

1. This paper brings Members up to date on operational and other matters, which, in themselves, do not warrant the production of a separate paper. The majority of these matters are for Members' information, but where approval is sought this is referred to in the report and summarised at the end. The specific matters covered in this report are:-

    a) Operations
    b) Waste Disposal Route For Lateral Flow Covid 19 Tests
    c) Booking System Update
    d) Performance Monitoring
    e) Education Programme
    f) Brexit Transition
    g) Carbon Metric project
    h) Cory's Community Fund
    i) Constituent Council New Recycling Initiatives
    j) Items costing between £5,000 and £30,000

OPERATIONS

2. There has been no major disruption in service to the main Transfer Stations operations since the last Authority meeting.

3. On 10th November 2020, at 20:35, a fire was detected in a container located under a tipping bay at the Transfer Station in Smugglers Way. The site was evacuated safely and the London Fire Brigade (LFB) attended and dealt with the fire by moving the container to the quayside for isolation. The LFB left when they were satisfied the fire was contained. Operations were resumed by 22:00 and an investigation took place which concluded that the most plausible cause of the fire was due to a battery which had been compressed within the compactor.

WASTE DISPOSAL ROUTE FOR LATERAL FLOW COVID 19 TESTS

4. In early January 2021, Hammersmith & Fulham requested that the Authority make arrangements to deal with waste generated from their three lateral flow testing sites. Kensington and Chelsea also made initial enquires about the options for disposal with this waste.

5. The swabs and cartridges generated from the testing process is waste categorised under a different Waste Code from the clinical waste normally delivered by the

constituent councils as they contain chemicals. At the time of writing, Smugglers Way is not permitted to accept this category of waste.

6. A temporary solution has been established, enabling the Boroughs to direct deliver to a specialist clinical waste company based in Sidcup.

7. Cory has submitted a permit amendment to the Environment Agency which, if granted, will mean that the swabs and cartridges can be delivered to Smugglers Way, placed into a wheeled bin (separate from the other clinical waste) and then transferred into a container and taken to the Belvedere Energy from Waste plant for disposal. A verbal update will be given at the meeting on the outcome of the permit amendment request.

BOOKING SYSTEM TRIAL AT THE HOUSEHOLD WASTE AND RECYCLING CENTRE

8. At the Authority meeting on 29th September 2020, it was agreed to introduce a booking system trial at the Household Waste and Recycling Centre (**"HWRC"**) for six-months, from 1st February 2021. A procurement process has been completed and, following an evaluation process, Bookinglab were appointed to provide a booking system and install a compatible ANPR system. Initially, Bookinglab will be appointed to facilitate the six-month trial after which, and if successful, a five year contract will be awarded to Bookinglab to provide the booking system and support in the longer term.

9. Bookinglab are a Birmingham based company and operate several HWRC booking systems, including for Kent County Council and Hampshire County Council. Bookinglab will work with Alert Systems Ltd., who will lead on the ANPR installation and ANPR support. This will be the first project for which Bookinglab will operate a synchronised booking system with an ANPR system at a HWRC that will allow complete automation of the system and negate the need for any manual checking of vehicle registration numbers. However, the synchronisation of booking systems and ANPR operations are commonplace in car parks.

10. A decision, following consultation with the Chairman, has been made to delay the trial start date to 1st March 2021 to allow ample lead-in time to communicate the change to residents and test the booking system before the launch of the trial. Members will also have the opportunity to test the system during this testing period. Residents will be able to start making bookings from 1st March 2021, ahead of the introduction of the "pre-booking only" system being introduced on Monday, 8th March 2021, although initially with a less strict educational period. The project planning is underway and officers held the initial start-up meeting

with Bookinglab on 6th January 2021. Weekly project meetings began from week commencing 11th January 2021.

Communications

11. The design for the artwork to communicate the change is being carried out by the Wandsworth design team and will consist of a well-defined and straightforward message highlighting that the change will take place from 8th March 2021. The communications will begin on 1st February 2021 and the following will be used to get the message out to residents:

    - Leaflets to be handed out at the HWRC
    - Electronic signage at the HWRC
    - Social Media – Nextdoor and Twitter
    - Paid for advertising on Facebook
    - The Authority's website and Borough websites

12. Full page adverts have been placed in local publications:

    - Brightside – March edition (distribution from 11th March 2021).
    - Lambeth Talk – Spring edition (distribution set for 22nd March 2021)
    - KCW Today –9th March edition

PERFORMANCE MONITORING

Introduction

13. Detailed tonnage tables are attached as Appendix A to this report. The tables shown set out:

    a) the tonnages of each waste type (including co-mingled recycling contamination) delivered by each constituent council in the current financial year up to 30th November 2020, together with projected outturn tonnages, compared against those budgeted for and the previous financial year's outturn;

    b) the projected annual cost for each commodity, compared to what these would be if the Authority's budgeted tonnage of each commodity was received;

c) forecast tonnages for future years, adjusted simply by the number of working days in each year; the major waste type and co-mingled contamination tonnages are also shown on a monthly as well as an annual basis;

d) comparisons of the tonnage of each major waste type handled by each constituent council on an annual basis;

e) comparisons by borough of the tonnages of Local Authority Collected Waste (LACW), household and non-household waste, household waste arisings per dwelling and per person; and

f) weight-based recycling performance on a household and LACW basis.

Points to Highlight

14. Whilst General Waste (the residual waste that cannot be reused or recycled and is sent for energy recovery) accounts for around 76% of the delivered waste stream, it accounts for 94% of the Authority's waste disposal costs after allowing for the treatment of the contamination within the co-mingled recycling. By comparison co-mingled recycling represents 19% of the delivered tonnage, but only accounts for 4% of the Authority's costs.

15. From tonnage data to date officers are predicting a 0.19% reduction in total waste handled by the Authority in 2020/21 from that budgeted for and a 1.93% decrease from that received in 2019/20. The tonnage of General Waste delivered by the constituent councils (ignoring contamination within the Co-Mingled recycling stream) and received at the HWRC is forecast to be 1.2% below that budgeted for and 1.93% below that received in 2019/20. All the predictions are based on the actual tonnage received up until 30th November 2020 but the usual flow of tonnage has been affected by the impact on Covid-19, particularly during the first quarter of 2020/21.

16. The predictions for General Waste vary significantly across the constituent councils; decreases compared to 2019/20 are predicted for Hammersmith & Fulham at 0.73% and Kensington and Chelsea at 20.08% whilst Lambeth and Wandsworth have predicted increases of 2.53% and 5.85% respectively. The loss of commercial waste in Kensington and Chelsea, due to reduced business activity, has significantly reduced the Royal Borough's General Waste tonnage, whilst more residents being at home has caused an increase in Wandsworth's tonnage. Hammersmith & Fulham and Lambeth General Waste tonnages appear to have

broadly balanced out, with reductions in commercial waste being offset by increased household waste due to more residents being at home.

17. The predicted tonnages of Co-Mingled recycling also vary considerably across the four boroughs, with increases for Hammersmith & Fulham at 6.54%, Lambeth at 13.26% and Wandsworth at 15.15%; again, officers believe this is as a result of residents spending more time at home. However, Kensington and Chelsea is currently forecast to have a decrease in Co-Mingled Recycling tonnage of 21.91%, again reflecting the lower amount of commercial waste it is currently managing.

18. The forecast for the Household Waste and Recycling Centre is also distorted because of the closure of the facility in April and May 2020, during the first lockdown, and currently predicts a reduction in total waste of 3.33% and a reduction in General Waste of 0.39% compared to that received in 2019/20. However, since re-opening the monthly tonnages have been consistently higher than the corresponding months in 2019/20, with General Waste up by 25% since re-opening. Some of this increase can be accounted for by material being stored by residents when the HWRC was closed, but as time goes on it probably reflects the fact that residents are spending more time at home and this ought to ease as lockdown restrictions hopefully ease in 2021.

EDUCATION PROGRAMME

Schools Programme

19. Since the last Authority meeting the Education Team has continued to carry out online workshops for schools via several online platforms. They have also introduced virtual tours of the Smugglers Way facility.

20. The response has been fair to date, but it is hoped that the take up will improve as the schools are now closed and are carrying out online lessons themselves which may further encourage them to use the Authority's online resources.

21. The table below details the online workshops that have either been carried out since the last Authority meeting, or are booked in to take place before the Spring Half Term break.

	Name of school/ed. establishment	Date	Total No. of workshops	Assembly
Autumn Term			**10**	**3**
Lambeth	St. John the Divine	16th Nov. 2020	1	
Lambeth	Woodmansterne	20th Nov and 1st, 7th, 9th, 10th, 11th Dec. 2020	8	
Wandsworth	Merlin	24th Nov. 2020	1	
Wandsworth	Smallwood	25th Nov. 2020		3
Spring Term			**30**	**3**
Wandsworth	Thomas's Clapham	13th Jan. 2021	4	
Lambeth	Larkhall Centre for Autism	18th Jan. 2021	1	
Lambeth	Whitehouse School	25th, 26th Jan. 2021	9	
Lambeth	Allen Edwards – provisional booking	1st, 2nd, 3rd Feb 2021	10	
RBKC	St. Joseph's – provisional booking	8th, 9th, 10th Feb. 2021	6	3
			Total Number of Adult Tours	
Wandsworth	Roehampton University	17th Nov. 2020	7	
Wandsworth	Roehampton University	22nd Jan. 2021	tbc	
Wandsworth	Roehampton University	29th Jan. 2021	tbc	

Resident Tours

22. The adult online tours of the Material Recycling Facility (**"MRF"**) and Smugglers Way Transfer Station are continuing with the Education Team using Social media to promote them, with 329 residents engaged with in November and December 2020. They have been well received to date.

23. The Team will also be introducing Family tours in the coming weeks. They will start at 4pm so that both parents and children can be involved.

24. The table below details the number of Adults online tours that have been carried out since the last Authority meeting or are planned to take place over the coming weeks. More details of the tours can be found on the WRWA website - https://wrwa.gov.uk/schools-adult-groups/online/

Autumn Term	**Type of Tour**	**Date**	**No. of Residents Approx.**
K&C and H&F	Resident Tour	13/11/2020	16
Wandsworth	Resident Tour	16/11/2020	15
Wandsworth	Resident Tour	20/11/2020	15
All Boroughs	Resident Tour	26/11/2020	19
All Boroughs	Resident Tour	01/12/2020	10
All Boroughs	Resident Tour	02/12/2020	2
Lambeth	Resident Tour	03/12/2020	8
All Boroughs	Resident Tour	04/12/2020	23
All Boroughs	Resident Tour	08/12/2020	22
Lambeth	Resident Tour	09/12/2020	16
All Boroughs	Resident Tour	17/12/2020	15
Wandsworth	Climate change Summit (panel)	18/11/2020	139
Total number of Residents (Approx.			**300**

Spring Term	**Type of Tour**	**Date**	**No. of Residents Approx.**
All Boroughs	Resident Tour	11/01/2021	22
All Boroughs	Resident Tour	13/01/2021	16
All Boroughs	Family Tour	19/01/2021	20
All Boroughs	Family Tour	20/01/2021	20
Wandsworth	Plastic Free Furzedown	18/01/2021	10

Wandsworth	Wandsworth Society	25/01/2021	10
Total number of Residents (Approx.)			**98**

COVID-19 PORT RESTRICTIONS AND BREXIT TRANSITION

25. On 21st December 2020, France blocked arrivals of UK passengers for 48 hours over concerns about the new coronavirus variant. Freight lorries were unable to cross by sea or through the Eurotunnel and the Port of Dover closed to outbound traffic. The Authority's waste management services contractor, Cory Riverside Energy (**"CRE"**), managed to maintain the outward flow of sorted material during this period by utilising some storage in the UK for Mixed Paper and a contingency outlet in the UK for cardboard.

26. At the last Authority meeting it was reported that there was a risk that, in early 2021, recycling markets, the value of recyclables and the ability to transport goods generally, including recyclable materials, across the channel could be disrupted if a Brexit Trade deal was not reached before the end of the transition period on 31st December 2020.

27. On 24th December 2020, the UK reached a deal on the United Kingdom's future trading and security relationship with the European Union. At the time of writing CRE have not had any difficulties transporting recycling commodities to EU Countries and, with the exception of one European haulier who failed to get the required paperwork in place in time for the deadline, all the other carriers have managed to obtain the necessary paperwork.

CARBON METRIC PROJECT – INTERIM REPORT

28. Following Authority approval at the Authority meeting in November 2019 (Paper No. WRWA 892), Wood PLC were appointed in May 2020 to carry out Carbon measurement work, provide some baseline carbon footprint data for the Authority's operations over the last ten years and formulate some SMART carbons targets for the Authority and the Constituent Councils. Attached as Appendix B is an interim report for members' information. It was originally planned to have the work completed by end of November 2020, but there were delays with the data gathering process and the Wood team was impacted by Covid-19.

29. The interim report has been prepared to describe the progress made to date in assessing the carbon impact of the Authority's and its constituent councils' waste management activities. Accurate data gathering has formed a strong baseline model and the options and assumptions have been formed through the direction of national policies, with input from both the Authority and Wood.

30. Wood are now on target to have the Carbon modelling for each option completed by the end of January 2021 and, once this process has been completed, the data will be distributed to Technical Officers and a report will be presented to the Authority meeting in June 2021.

CORY'S COMMUNITY FUND

31. At the Authority meeting on 29th September 2020, it was reported that Cory had announced the creation of the Cory Community Fund, which provides grants for groups which generate positive improvements in local people's lives. Applications for the first funding round closed on 15th November 2020.

32. On 15th January 2021, Cory announced that seven successful applicants will receive grants totalling £25,000. The successful applicants were selected by Cory's Employee Community Fund Committee. All applicants were assessed on whether their application aligned with Cory's goals to:

    - Positively impact local people in the community in meaningful ways
    - Protect the local environment and support the circular economy, including through building knowledge of recycling and waste management
    - Promote social and community cohesion, together with diversity and inclusion
    - Improve science, technology, engineering, and mathematical skills.

33. More than fifty organisations from boroughs where Cory operates applied for funding, with a maximum cap of £7,500 for individual grants. The successful seven applicants are:

    - Doorstep Library Network - £3,625
    - Thurrock Play Network - £2,200
    - upCYCLE - £2,000
    - The AHOY Centre - £4,400
    - Groundwork London - £7,500
    - ELMV Shadwell Basin Project - £1,750
    - West Thamesmead Community Organisation - £3,525

34. Further information on Cory's community initiatives can be found at https://www.coryenergy.com/community/overview/

CONSTITUENT COUNCIL RECYCLING INTIATIVES

35. At the meeting of the Authority on 22nd September 2010 (Paper No. WRWA 669A) Members instructed the Clerk to write to each of the constituent councils to inform them that, in future, should they wish to make arrangements themselves to recycle any significant tonnage of waste then, in accordance with Section 48 of the Environment Protection Act 1990, they must, as soon as reasonably practicable, notify the Authority in writing. The Authority will then approve or object to any such proposal at its next available meeting. The Clerk wrote to the constituent councils, as instructed, on 27th October 2010.

36. The constituent councils have not notified the Authority of any new initiatives since the previous Authority meeting.

ITEMS COSTING BETWEEN £5,000 AND £30,000

37. There have been no items of expenditure that have been authorised by officers under delegated powers that fall within the band range of £5,000 to £30,000 since the last Authority meeting.

COMMENTS OF THE TREASURER

38. The operations outlined in this paper, including the booking system, have and will continue to be met from within existing approved WRWA budgets.

RECOMMENDATION

39. Members are asked to receive this report as information.

M. Broxup
GENERAL MANAGER

Western Riverside Administration Office
Smugglers Way
Wandsworth
SW18 1JS
18th January 2021

Hammersmith & Fulham	After 8 months of 2020/2021 = Forecast Figures	Printed 06/01/2021 09:17

Tonnage	2019/2020 Outturn	2020/2021 Budget	2020/2021 Forecast	Difference to Budget Tonnes	Difference to Budget Percentage	2020/2021 £/Tonne	Budget 2020/2021 Cost £	Projected 2020/2021 Cost £	Projected 2020/2021 Variance £
Batteries	1	1	0	-0	-49%	61.00	41	21	-20
Clinical Waste	18	19	15	-3	-16.8%	600.00	11,145	9,270	-1,874
Co-Mingled	11,703	11,543	12,469	925	8.0%	28.00	323,213	349,119	25,905
Detritus Waste	449	411	446	35	8.6%	83.00	34,078	37,024	2,946
Electricals	20	11	23	12	103.5%	53.50	604	1,229	625
Fridges	89	85	84	-1	-1.7%	52.00	4,445	4,369	-76
Gas Bottles	1	0	1	0	139.6%	139.50	48	115	67
General Waste	56,021	55,421	55,614	193	0.3%	154.00	8,534,861	8,564,633	29,772
Carpet	-	-	-	-		154.00	-	-	-
Green Waste	83	4	267	263	7214.6%	103.00	376	27,491	27,115
Inert Waste	5	-	5	5		31.50	-	173	173
Paint & Oil	-	-	-	-		132.50	-	-	-
Paper & Cardboard	-	-	-	-		18.00	-	-	-
Scrap Metals	19	5	29	24	462.3%	-21.97	-114	-639	-525
Textiles	-	-	-	-		-199.50	-	-	-
Tyres	1	-	1	1		297.00	-	214	214
Wood	-	-	-	-		110.50	-	-	-
Grand Total	**68,410**	**67,500**	**68,955**	**1,455**	**2.2%**	**Sub-Total**	**8,908,697**	**8,993,018**	**84,321**
Contamination	1,594	1,555	1,632	77	4.9%	154.00	239,470	251,318	11,848
						Grand Total	**9,148,167**	**9,244,336**	**96,169**

Forecast Tonnes	2021/2022	2022/2023	2023/2024
Batteries	0	0	0
Clinical Waste	15	15	15
Co-Mingled	12,469	12,469	12,370
Detritus Waste	446	446	443
Electricals	23	23	23
Fridges	84	84	83
Gas Bottles	1	1	1
General Waste	55,614	55,614	55,175
Carpet	-	-	-
Green Waste	267	267	265
Inert Waste	5	5	5
Paint & Oil	-	-	-
Paper & Cardboard	-	-	-
Scrap Metals	29	29	29
Textiles	-	-	-
Tyres	1	1	1
Wood	-	-	-
Grand Total	**68,955**	**68,955**	**68,410**
Contamination	1,632	1,632	1,619

Co-Mingled Contamination	2016/2017	2017/2018	2018/2019	2019/2020	2020/2021
Apr	14.2%	11.6%	13.4%	13.8%	9.9%
May	12.1%	15.9%	13.0%	13.5%	11.7%
Jun	14.2%	12.1%	12.5%	14.5%	10.9%
Jul	11.0%	13.3%	15.8%	12.0%	17.2%
Aug	13.0%	17.1%	15.8%	16.4%	12.9%
Sep	12.9%	11.5%	16.6%	13.3%	14.8%
Oct	13.5%	15.1%	19.3%	10.7%	13.1%
Nov	16.0%	13.5%	15.3%	14.4%	13.6%
Dec	18.5%	16.8%	18.7%	12.3%	13.1%
Jan	15.7%	16.1%	16.5%	16.2%	13.1%
Feb	15.2%	13.7%	12.1%	13.4%	13.1%
Mar	11.9%	12.0%	12.9%	13.8%	13.1%
Average	14.0%	14.1%	15.2%	13.6%	13.1%
				Budget	13.5%

Working Days	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
Total	254	253	253	253	251
Diff from Year before		-1	0	0	-2
Change		-0.39%	0.00%	0.00%	-0.79%

General Waste Tonnes	2019/2020	2020/2021	Difference	
Apr	4,633	4,462	-171	-3.68%
May	4,909	4,518	-391	-7.97%
Jun	4,551	4,947	396	8.71%
Jul	5,064	4,840	-224	-4.43%
Aug	4,460	4,396	-64	-1.43%
Sep	4,574	4,801	226	4.94%
Oct	4,951	4,841	-109	-2.20%
Nov	4,769	4,806	37	0.78%
Dec	4,828	4,799	-29	-0.60%
Jan	4,632	4,604	-28	-0.60%
Feb	4,111	4,086	-24	-0.60%
Mar	4,541	4,514	-27	-0.60%
Total	**56,021**	**55,614**	**-407**	**-0.73%**

Co-Mingled Tonnes	2019/2020	2020/2021	Difference	
Apr	913	969	56	6.16%
May	985	961	-24	-2.44%
Jun	912	1,048	135	14.85%
Jul	1,038	1,122	84	8.09%
Aug	879	925	46	5.28%
Sep	974	1,028	53	5.48%
Oct	1,060	1,103	42	3.99%
Nov	983	1,091	108	10.95%
Dec	1,078	1,150	72	6.68%
Jan	1,030	1,099	69	6.68%
Feb	875	934	58	6.68%
Mar	975	1,040	65	6.68%
Total	**11,703**	**12,469**	**766**	**6.54%**

Detritus Waste Tonnes	2019/2020	2020/2021	Difference	
Apr	29	28	-2	-5.24%
May	27	26	-1	-3.29%
Jun	40	29	-11	-28.10%
Jul	34	32	-2	-6.62%
Aug	35	33	-3	-7.28%
Sep	38	32	-6	-16.68%
Oct	42	65	23	54.96%
Nov	64	64	-0	-0.37%
Dec	42	41	-0	-0.41%
Jan	30	30	-0	-0.41%
Feb	39	39	-0	-0.41%
Mar	27	27	-0	-0.41%
Total	**449**	**446**	**-2**	**-0.55%**

Co-mingled Contamination Tonnes	2019/2020	2020/2021	Difference	
Apr	126	96	-29	-23.39%
May	133	112	-21	-15.54%
Jun	132	115	-18	-13.37%
Jul	124	192	68	54.74%
Aug	144	119	-24	-16.97%
Sep	130	152	23	17.37%
Oct	113	144	31	27.52%
Nov	142	148	6	4.57%
Dec	132	150	18	13.98%
Jan	167	144	-23	-13.97%
Feb	117	122	5	4.59%
Mar	135	136	1	0.96%
Total	**1,594**	**1,632**	**38**	**2.37%**

Green Waste Tonnes	2019/2020	2020/2021	Difference	
Apr	-	-	-	0.00%
May	-	-	-	0.00%
Jun	-	-	-	0.00%
Jul	-	-	-	0.00%
Aug	-	0	0	0.00%
Sep	-	-	-	0.00%
Oct	1	2	1	46.48%
Nov	-	2	2	0.00%
Dec	-	-	-	0.00%
Jan	82	262	180	220.34%
Feb	-	-	-	0.00%
Mar	-	-	-	0.00%
Total	**83**	**267**	**184**	**220.33%**

Wood Waste Tonnes	2019/2020	2020/2021	Difference	
Apr	-	-	-	0.00%
May	-	-	-	0.00%
Jun	-	-	-	0.00%
Jul	-	-	-	0.00%
Aug	-	-	-	0.00%
Sep	-	-	-	0.00%
Oct	-	-	-	0.00%
Nov	-	-	-	0.00%
Dec	-	-	-	0.00%
Jan	-	-	-	0.00%
Feb	-	-	-	0.00%
Mar	-	-	-	0.00%
Total	**-**	**-**	**-**	**0.00%**

Kensington and Chelsea | After 8 months of 2020/2021 | = Forecast Figures | Printed 06/01/2021 09:17

Tonnage	2019/2020 Outturn	2020/2021 Budget	2020/2021 Forecast	Difference to Budget Tonnes	Difference to Budget Percentage	2020/2021 £/Tonne	Budget 2020/2021 Cost £	Projected 2020/2021 Cost £	Projected 2020/2021 Variance £
Batteries	-	-	-	-		61.00	-	-	-
Clinical Waste	1	1	1	- 0	-24.2%	600.00	876	664	- 212
Co-Mingled	15,961	15,995	12,464	- 3,531	-22.1%	28.00	447,856	348,982	- 98,874
Detritus Waste	1,021	1,222	775	- 447	-36.6%	83.00	101,387	64,307	- 37,080
Electricals	26	21	39	18	87.5%	53.50	1,103	2,069	965
Fridges	51	54	42	- 12	-23.0%	52.00	2,815	2,168	- 647
Gas Bottles	1	1	1	0	18.6%	139.50	111	132	21
General Waste	58,209	57,965	46,521	- 11,444	-19.7%	154.00	8,926,595	7,164,185	- 1,762,410
Carpet	-	-	-	-		154.00	-	-	-
Green Waste	475	463	510	48	10.3%	103.00	47,638	52,547	4,909
Inert Waste	-	-	2	2		31.50	-	75	75
Paint & Oil	-	-	-	-		132.50	-	-	-
Paper & Cardboard	-	-	-	-		18.00	-	-	-
Scrap Metals	-	-	0	0		- 21.97	-	- 7	- 7
Textiles	-	-	-	-		- 199.50	-	-	-
Tyres	-	-	-	-		297.00	-	-	-
Wood	1	1	-	- 1	-100.0%	110.50	66	-	- 66
Grand Total	**75,746**	**75,721**	**60,354**	**- 15,367**	**-20.3%**	**Sub-Total**	**9,528,448**	**7,635,122**	**- 1,893,326**
Contamination	1,699	1,690	1,390	- 300	-17.8%	154.00	260,260	214,046	- 46,214
						Grand Total	**9,788,708**	**7,849,167**	**- 1,939,540**

Forecast Tonnes	2021/2022	2022/2023	2023/2024
Batteries	-	-	-
Clinical Waste	1	1	1
Co-Mingled	12,464	12,464	12,365
Detritus Waste	775	775	769
Electricals	39	39	38
Fridges	42	42	41
Gas Bottles	1	1	1
General Waste	46,521	46,521	46,153
Carpet	-	-	-
Green Waste	510	510	506
Inert Waste	2	2	2
Paint & Oil	-	-	-
Paper & Cardboard	-	-	-
Scrap Metals	0	0	0
Textiles	-	-	-
Tyres	-	-	-
Wood	-	-	-
Grand Total	**60,354**	**60,354**	**59,877**
Contamination	1,390	1,390	1,379

Co-Mingled Contamination	2016/2017	2017/2018	2018/2019	2019/2020	2020/2021
Apr	10.8%	14.7%	12.2%	9.5%	9.2%
May	11.5%	11.8%	10.9%	10.0%	10.7%
Jun	11.1%	13.2%	11.0%	11.3%	10.0%
Jul	11.1%	12.1%	13.2%	9.3%	11.4%
Aug	11.3%	14.3%	11.4%	13.9%	10.8%
Sep	13.1%	11.9%	12.7%	11.1%	12.2%
Oct	11.9%	14.0%	10.1%	10.0%	11.6%
Nov	12.1%	10.6%	11.2%	10.0%	12.6%
Dec	11.4%	12.3%	13.6%	10.7%	11.2%
Jan	11.8%	11.3%	9.9%	12.0%	11.2%
Feb	12.6%	11.7%	13.0%	10.6%	11.2%
Mar	13.6%	9.2%	10.9%	9.9%	11.2%
Average	11.9%	12.2%	11.7%	10.6%	11.2%
				Budget	10.6%

Working Days	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
Total	254	253	253	253	251
Diff from Year before		-1	0	0	-2
Change		-0.39%	0.00%	0.00%	-0.79%

General Waste Tonnes	2019/2020	2020/2021	Difference	
Apr	4,741	3,473	- 1,267	-26.73%
May	4,937	3,491	- 1,446	-29.28%
Jun	4,813	3,989	- 823	-17.11%
Jul	5,156	3,921	- 1,235	-23.96%
Aug	4,899	3,675	- 1,223	-24.97%
Sep	4,858	4,189	- 669	-13.77%
Oct	5,153	4,541	- 613	-11.89%
Nov	5,128	4,416	- 712	-13.89%
Dec	5,051	4,042	- 1,009	-19.97%
Jan	4,722	3,779	- 943	-19.97%
Feb	4,328	3,463	- 864	-19.97%
Mar	4,424	3,541	- 884	-19.97%
Total	**58,209**	**46,521**	**- 11,689**	**-20.08%**

Co-Mingled Tonnes	2019/2020	2020/2021	Difference	
Apr	1,266	847	- 419	-33.13%
May	1,331	953	- 378	-28.43%
Jun	1,335	1,106	- 229	-17.15%
Jul	1,467	1,034	- 433	-29.51%
Aug	1,176	934	- 242	-20.59%
Sep	1,373	1,191	- 182	-13.23%
Oct	1,430	1,204	- 226	-15.82%
Nov	1,385	1,131	- 254	-18.33%
Dec	1,476	1,154	- 322	-21.81%
Jan	1,325	1,036	- 289	-21.81%
Feb	1,189	930	- 259	-21.81%
Mar	1,208	945	- 264	-21.81%
Total	**15,961**	**12,464**	**- 3,497**	**-21.91%**

Detritus Waste Tonnes	2019/2020	2020/2021	Difference	
Apr	76	60	- 16	-21.19%
May	75	70	- 4	-5.45%
Jun	84	70	- 15	-17.44%
Jul	81	56	- 24	-30.17%
Aug	88	56	- 31	-35.61%
Sep	85	59	- 26	-30.60%
Oct	100	98	- 1	-1.46%
Nov	152	92	- 61	-39.91%
Dec	75	57	- 18	-23.98%
Jan	75	57	- 18	-23.98%
Feb	80	60	- 19	-23.98%
Mar	52	39	- 12	-23.98%
Total	**1,021**	**775**	**- 246**	**-24.09%**

Co-mingled Contamination Tonnes	2019/2020	2020/2021	Difference	
Apr	121	77	- 43	-35.79%
May	133	102	- 31	-23.19%
Jun	151	110	- 41	-26.88%
Jul	136	118	- 18	-13.37%
Aug	163	101	- 62	-38.19%
Sep	152	146	- 6	-4.14%
Oct	143	139	- 4	-2.51%
Nov	138	143	4	3.15%
Dec	157	129	- 29	-18.28%
Jan	159	116	- 43	-27.34%
Feb	125	104	- 22	-17.35%
Mar	120	105	- 14	-11.92%
Total	**1,699**	**1,390**	**- 309**	**-18.18%**

Green Waste Tonnes	2019/2020	2020/2021	Difference	
Apr	23	25	2	8.38%
May	32	30	- 2	-6.20%
Jun	36	35	- 0	-0.73%
Jul	36	41	5	14.43%
Aug	28	27	- 1	-4.13%
Sep	29	39	10	32.54%
Oct	43	44	0	0.46%
Nov	56	64	7	13.21%
Dec	39	42	3	7.58%
Jan	108	116	8	7.58%
Feb	23	25	2	7.58%
Mar	20	22	2	7.58%
Total	**475**	**510**	**35**	**7.45%**

Wood Waste Tonnes	2019/2020	2020/2021	Difference	
Apr	-	-	-	0.00%
May	-	-	-	0.00%
Jun	-	-	-	0.00%
Jul	-	-	-	0.00%
Aug	1	-	- 1	-100.00%
Sep	-	-	-	0.00%
Oct	-	-	-	0.00%
Nov	-	-	-	0.00%
Dec	-	-	-	0.00%
Jan	-	-	-	0.00%
Feb	-	-	-	0.00%
Mar	-	-	-	0.00%
Total	**1**	**-**	**- 1**	**-100.00%**

Lambeth | After 8 months of 2020/2021 | = Forecast Figures | Printed 06/01/2021 09:17

Tonnage	2019/2020 Outturn	2020/2021 Budget	2020/2021 Forecast	Difference to Budget Tonnes	Difference to Budget Percentage	2020/2021 £/Tonne	Budget 2020/2021 Cost £	Projected 2020/2021 Cost £	Projected 2020/2021 Variance £
Batteries	-	-	-	-		61.00	-	-	-
Clinical Waste	3	4	4	- 0	-4.8%	600.00	2,219	2,113	- 106
Co-Mingled	19,543	19,078	22,135	3,057	16.0%	28.00	534,176	619,774	85,598
Detritus Waste	518	518	576	58	11.2%	83.00	42,958	47,782	4,824
Electricals	113	94	62	- 33	-34.6%	53.50	5,040	3,296	- 1,744
Fridges	174	160	151	- 9	-5.5%	52.00	8,333	7,874	- 459
Gas Bottles	4	3	1	- 2	-68.4%	139.50	440	139	- 301
General Waste	86,536	86,356	88,722	2,366	2.7%	154.00	13,298,785	13,663,208	364,423
Carpet	-	-	-	-		154.00	-	-	-
Green Waste	733	736	690	- 46	-6.2%	103.00	75,785	71,097	- 4,688
Inert Waste	2	2	-	- 2	-100.0%	31.50	52	-	- 52
Paint & Oil	-	-	-	-		132.50	-	-	-
Paper & Cardboard	423	387	434	48	12.3%	18.00	6,960	7,815	855
Scrap Metals	114	122	56	- 66	-54.1%	- 21.97	- 2,677	- 1,227	1,449
Textiles	-	-	-	-		- 199.50	-	-	-
Tyres	8	7	6	- 1	-8.9%	297.00	1,995	1,818	- 177
Wood	140	200	-	- 200	-100.0%	110.50	22,060	-	- 22,060
Grand Total	**108,311**	**107,665**	**112,837**	**5,172**	**4.8%**	**Sub-Total**	**13,996,128**	**14,423,690**	**427,562**
Contamination	2,796	2,672	3,163	491	18.4%	154.00	411,488	487,044	75,556
						Grand Total	**14,407,616**	**14,910,735**	**503,119**

Forecast Tonnes	2021/2022	2022/2023	2023/2024
Batteries	-	-	-
Clinical Waste	4	4	3
Co-Mingled	22,135	22,135	21,960
Detritus Waste	576	576	571
Electricals	62	62	61
Fridges	151	151	150
Gas Bottles	1	1	1
General Waste	88,722	88,722	88,021
Carpet	-	-	-
Green Waste	690	690	685
Inert Waste	-	-	-
Paint & Oil	-	-	-
Paper & Cardboard	434	434	431
Scrap Metals	56	56	55
Textiles	-	-	-
Tyres	6	6	6
Wood	-	-	-
Grand Total	**112,837**	**112,837**	**111,945**
Contamination	3,163	3,163	3,138

Co-Mingled Contamination	2016/2017	2017/2018	2018/2019	2019/2020	2020/2021
Apr	12.6%	16.5%	15.7%	11.1%	11.3%
May	13.8%	17.7%	12.2%	16.8%	14.4%
Jun	14.9%	11.5%	16.8%	13.2%	11.3%
Jul	11.9%	22.4%	16.2%	15.6%	14.6%
Aug	11.9%	18.9%	16.7%	13.6%	19.2%
Sep	13.4%	14.9%	19.2%	13.9%	16.9%
Oct	11.9%	13.1%	20.2%	12.7%	12.5%
Nov	15.3%	15.0%	14.9%	14.5%	15.1%
Dec	12.2%	17.8%	18.4%	15.6%	14.3%
Jan	16.3%	16.2%	16.5%	16.2%	14.3%
Feb	13.2%	15.9%	14.5%	16.7%	14.3%
Mar	18.6%	17.6%	15.3%	11.7%	14.3%
Average	13.9%	16.5%	16.4%	14.3%	14.3%
				Budget	14.0%

Working Days	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
Total	254	253	253	253	251
Diff from Year before		-1	0	0	-2
Change		-0.39%	0.00%	0.00%	-0.79%

General Waste Tonnes	2019/2020	2020/2021	Difference	
Apr	7,319	7,070	- 249	-3.40%
May	7,471	7,227	- 244	-3.27%
Jun	7,037	7,685	648	9.20%
Jul	7,787	7,745	- 42	-0.54%
Aug	7,089	7,263	174	2.45%
Sep	6,953	7,644	691	9.93%
Oct	7,611	7,700	89	1.17%
Nov	7,205	7,577	372	5.16%
Dec	7,445	7,643	198	2.66%
Jan	7,211	7,403	192	2.66%
Feb	6,381	6,550	170	2.66%
Mar	7,028	7,215	187	2.66%
Total	**86,536**	**88,722**	**2,186**	**2.53%**

Co-Mingled Tonnes	2019/2020	2020/2021	Difference	
Apr	1,579	1,813	235	14.86%
May	1,710	1,814	105	6.12%
Jun	1,497	1,998	502	33.54%
Jul	1,672	1,939	266	15.94%
Aug	1,524	1,632	107	7.04%
Sep	1,540	1,662	122	7.92%
Oct	1,704	1,786	82	4.84%
Nov	1,534	1,797	263	17.14%
Dec	1,751	1,985	235	13.41%
Jan	1,824	2,069	245	13.41%
Feb	1,503	1,705	202	13.41%
Mar	1,706	1,935	229	13.41%
Total	**19,543**	**22,135**	**2,592**	**13.26%**

Detritus Waste Tonnes	2019/2020	2020/2021	Difference	
Apr	32	38	6	18.96%
May	38	44	7	17.66%
Jun	41	41	0	0.49%
Jul	23	39	16	66.44%
Aug	37	45	8	20.59%
Sep	44	48	4	9.60%
Oct	56	66	10	18.32%
Nov	88	77	- 11	-12.84%
Dec	51	57	6	11.18%
Jan	40	44	4	11.18%
Feb	38	42	4	11.18%
Mar	31	34	3	11.18%
Total	**518**	**576**	**57**	**11.03%**

Co-mingled Contamination Tonnes	2019/2020	2020/2021	Difference	
Apr	175	259	84	48.25%
May	287	259	- 27	-9.59%
Jun	197	286	88	44.77%
Jul	262	277	15	5.91%
Aug	207	233	26	12.79%
Sep	214	237	23	10.93%
Oct	217	255	39	17.85%
Nov	222	257	35	15.67%
Dec	272	284	11	4.20%
Jan	295	296	1	0.27%
Feb	251	244	- 7	-2.80%
Mar	199	276	78	38.97%
Total	**2,796**	**3,163**	**367**	**13.11%**

Green Waste Tonnes	2019/2020	2020/2021	Difference	
Apr	6	11	5	94.76%
May	15	21	6	43.44%
Jun	28	36	8	27.22%
Jul	34	36	2	6.28%
Aug	31	44	13	41.36%
Sep	51	43	- 9	-17.00%
Oct	76	79	3	3.88%
Nov	206	151	- 55	-26.78%
Dec	136	129	- 8	-5.69%
Jan	91	85	- 5	-5.69%
Feb	46	44	- 3	-5.69%
Mar	12	11	- 1	-5.69%
Total	**733**	**690**	**- 43**	**-5.80%**

Wood Waste Tonnes	2019/2020	2020/2021	Difference	
Apr	32	-	- 32	-100.00%
May	27	-	- 27	-100.00%
Jun	20	-	- 20	-100.00%
Jul	25	-	- 25	-100.00%
Aug	18	-	- 18	-100.00%
Sep	17	-	- 17	-100.00%
Oct	-	-	-	0.00%
Nov	-	-	-	0.00%
Dec	-	-	-	0.00%
Jan	0	-	- 0	-100.00%
Feb	-	-	-	0.00%
Mar	-	-	-	0.00%
Total	**140**	**-**	**- 140**	**-100.00%**

Wandsworth	After 8 months of 2020/2021	Printed	06/01/2021 09:17
	= Forecast Figures		

Tonnage	2019/2020 Outturn	2020/2021 Budget	2020/2021 Forecast	Difference to Budget Tonnes	Difference to Budget Percentage	2020/2021 £/Tonne	Budget 2020/2021 Cost £	Projected 2020/2021 Cost £	Projected 2020/2021 Variance £
Batteries	-	-	-	-		61.00	-	-	-
Clinical Waste	66	66	61	- 5	-7.5%	600.00	39,394	36,421	- 2,973
Co-Mingled	20,355	19,774	23,437	3,664	18.5%	28.00	553,663	656,243	102,579
Detritus Waste	2,841	2,694	2,905	212	7.9%	83.00	223,582	241,145	17,563
Electricals	2	2	4	2	118.0%	53.50	93	203	110
Fridges	153	172	67	- 105	-61.1%	52.00	8,963	3,484	- 5,479
Gas Bottles	1	0	3	3	1045.1%	139.50	40	452	413
General Waste	75,666	74,482	80,090	5,608	7.5%	154.00	11,470,199	12,333,901	863,702
Carpet	-	-	-	-		154.00	-	-	-
Green Waste	449	498	451	- 47	-9.4%	103.00	51,261	46,433	- 4,827
Inert Waste	15	11	1	- 10	-94.4%	31.50	335	19	- 316
Paint & Oil	-	-	-	-		132.50	-	-	-
Paper & Cardboard	-	-	2	2		18.00	-	28	28
Scrap Metals	4	0	10	10	4584.9%	- 21.97	- 5	- 228	- 223
Textiles	-	-	-	-		- 199.50	-	-	-
Tyres	1	1	1	1	73.1%	297.00	209	362	153
Wood	-	-	-	-		110.50	-	-	-
Grand Total	**99,551**	**97,699**	**107,032**	**9,334**	**9.6%**	**Sub-Total**	**12,347,734**	**13,318,464**	**970,729**
Contamination	2,602	2,504	3,012	508	20.3%	154.00	385,616	463,923	78,307
						Grand Total	**12,733,350**	**13,782,387**	**1,049,037**

Forecast Tonnes	2021/2022	2022/2023	2023/2024
Batteries	-	-	-
Clinical Waste	61	61	60
Co-Mingled	23,437	23,437	23,252
Detritus Waste	2,905	2,905	2,882
Electricals	4	4	4
Fridges	67	67	66
Gas Bottles	3	3	3
General Waste	80,090	80,090	79,457
Carpet	-	-	-
Green Waste	451	451	447
Inert Waste	1	1	1
Paint & Oil	-	-	-
Paper & Cardboard	2	2	2
Scrap Metals	10	10	10
Textiles	-	-	-
Tyres	1	1	1
Wood	-	-	-
Grand Total	**107,032**	**107,032**	**106,186**
Contamination	3,012	3,012	2,989

Co-Mingled Contamination	2016/2017	2017/2018	2018/2019	2019/2020	2020/2021
Apr	13.2%	15.6%	14.1%	11.7%	8.9%
May	12.7%	11.9%	12.8%	11.9%	13.9%
Jun	17.9%	15.4%	14.1%	13.8%	13.1%
Jul	16.4%	16.2%	15.1%	12.0%	13.8%
Aug	16.1%	16.8%	14.8%	13.2%	13.8%
Sep	14.3%	11.3%	16.2%	11.8%	16.1%
Oct	14.3%	15.4%	13.2%	15.4%	11.9%
Nov	12.2%	16.0%	13.4%	11.5%	11.5%
Dec	13.3%	14.9%	15.5%	11.9%	12.9%
Jan	16.3%	14.4%	15.2%	15.2%	12.9%
Feb	16.1%	12.2%	13.3%	14.0%	12.9%
Mar	13.9%	17.5%	11.9%	10.9%	12.9%
Average	14.7%	14.8%	14.1%	12.8%	12.9%
				Budget	12.7%

Working Days	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
Total	254	253	253	253	251
Diff from Year before		-1	0	0	-2
Change		-0.39%	0.00%	0.00%	-0.79%

General Waste Tonnes	2019/2020	2020/2021	Difference	
Apr	6,318	6,796	478	7.57%
May	6,693	6,689	- 4	-0.06%
Jun	6,046	7,215	1,169	19.34%
Jul	6,923	7,061	137	1.98%
Aug	6,104	6,107	3	0.05%
Sep	6,136	6,683	547	8.92%
Oct	6,616	6,551	- 66	-0.99%
Nov	6,183	6,866	683	11.05%
Dec	6,348	6,728	380	5.99%
Jan	6,328	6,707	379	5.99%
Feb	5,521	5,852	331	5.99%
Mar	6,450	6,836	386	5.99%
Total	**75,666**	**80,090**	**4,425**	**5.85%**

Co-Mingled Tonnes	2019/2020	2020/2021	Difference	
Apr	1,608	1,823	215	13.39%
May	1,698	1,875	177	10.42%
Jun	1,565	2,078	513	32.74%
Jul	1,744	2,011	267	15.32%
Aug	1,550	1,622	72	4.66%
Sep	1,575	1,789	214	13.59%
Oct	1,726	1,995	268	15.55%
Nov	1,719	1,979	260	15.11%
Dec	1,920	2,214	294	15.29%
Jan	1,956	2,255	299	15.29%
Feb	1,526	1,759	233	15.29%
Mar	1,766	2,036	270	15.29%
Total	**20,355**	**23,437**	**3,083**	**15.15%**

Detritus Waste Tonnes	2019/2020	2020/2021	Difference	
Apr	172	187	16	9.12%
May	219	199	- 19	-8.89%
Jun	183	212	29	15.57%
Jul	208	194	- 14	-6.91%
Aug	232	218	- 14	-5.99%
Sep	246	201	- 45	-18.29%
Oct	283	353	70	24.75%
Nov	441	464	22	5.02%
Dec	304	312	7	2.41%
Jan	200	205	5	2.41%
Feb	190	194	5	2.41%
Mar	164	168	4	2.41%
Total	**2,841**	**2,905**	**64**	**2.27%**

Co-mingled Contamination Tonnes	2019/2020	2020/2021	Difference	
Apr	188	234	46	24.36%
May	203	241	38	18.97%
Jun	215	267	52	24.09%
Jul	209	259	49	23.63%
Aug	204	208	5	2.30%
Sep	186	230	44	23.63%
Oct	267	256	- 10	-3.81%
Nov	198	254	56	28.33%
Dec	229	285	56	24.53%
Jan	298	290	- 8	-2.64%
Feb	214	226	12	5.85%
Mar	192	262	70	36.45%
Total	**2,602**	**3,012**	**411**	**15.79%**

Green Waste Tonnes	2019/2020	2020/2021	Difference	
Apr	8	14	7	87.99%
May	12	16	4	35.01%
Jun	17	23	5	31.32%
Jul	19	16	- 3	-14.58%
Aug	16	14	- 1	-8.25%
Sep	19	15	- 4	-20.23%
Oct	18	16	- 2	-12.40%
Nov	26	20	- 6	-22.01%
Dec	47	48	0	0.47%
Jan	237	238	1	0.47%
Feb	21	21	0	0.47%
Mar	10	10	0	0.47%
Total	**449**	**451**	**2**	**0.41%**

Wood Waste Tonnes	2019/2020	2020/2021	Difference	
Apr	-	-	-	0.00%
May	-	-	-	0.00%
Jun	-	-	-	0.00%
Jul	-	-	-	0.00%
Aug	-	-	-	0.00%
Sep	-	-	-	0.00%
Oct	-	-	-	0.00%
Nov	-	-	-	0.00%
Dec	-	-	-	0.00%
Jan	-	-	-	0.00%
Feb	-	-	-	0.00%
Mar	-	-	-	0.00%
Total	**-**	**-**	**-**	**0.00%**

Household Waste & Recycling Centre & Charity — After 8 months of 2020/2021 = Forecast Figures

Printed 06/01/2021 09:17

Tonnage	2019/2020 Outturn	2020/2021 Budget	2020/2021 Forecast	Difference to Budget Tonnes	Difference to Budget Percentage	2020/2021 £/Tonne	Budget 2020/2021 Cost £	Projected 2020/2021 Cost £	Projected 2020/2021 Variance £
Batteries	24	31	34	4	13%	61.00	1,867	2,104	237
Clinical Waste	-	-	-	-		600.00	-	-	-
Co-Mingled	538	588	296	-292	-49.7%	28.00	16,477	8,290	-8,188
Detritus Waste	-	-	-	-		83.00	-	-	-
Electricals	726	733	729	-4	-0.6%	53.50	39,219	38,992	-227
Fridges	79	76	77	1	1.3%	52.00	3,972	4,024	52
Gas Bottles	-	13	8	-4	-34.4%	139.50	1,794	1,177	-617
General Waste	8,865	8,957	8,831	-126	-1.4%	154.00	1,379,324	1,359,899	-19,425
Carpet	375	392	359	-33	-8.3%	154.00	60,350	55,324	-5,026
Green Waste	3,171	3,186	2,891	-295	-9.3%	103.00	328,151	297,766	-30,384
Inert Waste	1,677	1,803	1,710	-93	-5.2%	31.50	56,807	53,871	-2,936
Paint & Oil	17	18	11	-7	-38.4%	132.50	2,378	1,465	-914
Paper & Cardboard	962	977	1,065	88	9.0%	18.00	17,584	19,165	1,581
Scrap Metals	666	658	641	-17	-2.6%	-21.97	-14,465	-14,085	380
Textiles	254	257	265	7	2.8%	-199.50	-51,333	-52,780	-1,448
Tyres	-	-	-	-		297.00	-	-	-
Wood	3,773	4,041	3,507	-535	-13.2%	110.50	446,578	387,482	-59,096
Grand Total	**21,128**	**21,731**	**20,424**	**-1,307**	**-6.0%**	**Sub-Total**	**2,288,704**	**2,162,694**	**-126,010**
Contamination	69	75	40	-35	-46.1%	154.00	11,550	6,223	-5,327
						Grand Total	**2,300,254**	**2,168,916**	**-131,338**

Forecast Tonnes	2021/2022	2022/2023	2023/2024
Batteries	34	34	34
Clinical Waste	-	-	-
Co-Mingled	296	296	294
Detritus Waste	-	-	-
Electricals	729	729	723
Fridges	77	77	77
Gas Bottles	8	8	8
General Waste	8,831	8,831	8,761
Carpet	359	359	356
Green Waste	2,891	2,891	2,868
Inert Waste	1,710	1,710	1,697
Paint & Oil	11	11	11
Paper & Cardboard	1,065	1,065	1,056
Scrap Metals	641	641	636
Textiles	265	265	262
Tyres	-	-	-
Wood	3,507	3,507	3,479
Grand Total	**20,424**	**20,424**	**20,263**
Contamination	40	40	40

Co-Mingled Contamination	2016/2017	2017/2018	2018/2019	2019/2020	2020/2021
Apr	12.6%	15.0%	14.0%	11.4%	9.9%
May	12.6%	14.3%	12.2%	13.2%	13.1%
Jun	14.8%	13.2%	13.9%	13.1%	11.6%
Jul	12.9%	16.6%	15.1%	12.4%	14.3%
Aug	13.2%	16.9%	14.8%	14.0%	14.8%
Sep	13.5%	12.5%	16.3%	12.5%	15.3%
Oct	12.9%	14.3%	15.5%	12.5%	12.2%
Nov	13.7%	14.0%	13.6%	12.5%	13.2%
Dec	13.4%	15.4%	16.4%	12.7%	13.6%
Jan	15.1%	14.5%	14.7%	15.0%	13.6%
Feb	14.3%	13.4%	13.4%	13.9%	13.6%
Mar	14.8%	14.6%	12.8%	11.4%	13.6%
Average	13.6%	14.6%	14.6%	12.8%	13.6%
				Budget	12.7%

Working Days	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
Total	254	253	253	253	251
Diff from Year before		-1	0	0	-2
Change		-0.39%	0.00%	0.00%	-0.79%

General Waste Tonnes	2019/2020	2020/2021	Difference	
Apr	873	1	-872	-99.92%
May	949	599	-349	-36.82%
Jun	784	1,065	281	35.87%
Jul	867	1,053	187	21.57%
Aug	897	1,004	107	11.96%
Sep	772	930	158	20.42%
Oct	663	886	223	33.61%
Nov	628	865	237	37.69%
Dec	608	607	-2	-0.25%
Jan	669	667	-2	-0.25%
Feb	586	585	-1	-0.25%
Mar	570	568	-1	-0.25%
Total	**8,865**	**8,831**	**-35**	**-0.39%**

Co-Mingled Tonnes	2019/2020	2020/2021	Difference	
Apr	55	-	-55	-100.00%
May	56	5	-51	-91.00%
Jun	60	29	-31	-51.90%
Jul	55	34	-20	-37.15%
Aug	47	39	-8	-16.99%
Sep	37	35	-2	-6.39%
Oct	32	33	1	1.61%
Nov	39	34	-5	-12.12%
Dec	55	30	-25	-44.91%
Jan	41	22	-18	-44.91%
Feb	28	16	-13	-44.91%
Mar	34	19	-15	-44.91%
Total	**538**	**296**	**-242**	**-44.98%**

Detritus Waste Tonnes	2019/2020	2020/2021	Difference	
Apr	-	-	-	0.00%
May	-	-	-	0.00%
Jun	-	-	-	0.00%
Jul	-	-	-	0.00%
Aug	-	-	-	0.00%
Sep	-	-	-	0.00%
Oct	-	-	-	0.00%
Nov	-	-	-	0.00%
Dec	-	-	-	0.00%
Jan	-	-	-	0.00%
Feb	-	-	-	0.00%
Mar	-	-	-	0.00%
Total	**-**	**-**	**-**	**0.00%**

Co-mingled Contamination Tonnes	2019/2020	2020/2021	Difference	
Apr	6	-	-6	-100.00%
May	7	1	-7	-91.04%
Jun	8	3	-5	-57.37%
Jul	7	5	-2	-27.40%
Aug	7	6	-1	-12.08%
Sep	5	5	1	14.66%
Oct	4	4	-0	-0.44%
Nov	5	4	-0	-7.09%
Dec	7	4	-3	-40.77%
Jan	6	3	-3	-49.78%
Feb	4	2	-2	-45.79%
Mar	4	3	-1	-34.09%
Total	**69**	**40**	**-29**	**-41.54%**

Green Waste Tonnes	2019/2020	2020/2021	Difference	
Apr	363	-	-363	-100.00%
May	407	293	-113	-27.85%
Jun	372	448	75	20.27%
Jul	334	365	31	9.18%
Aug	356	322	-34	-9.43%
Sep	296	364	68	22.93%
Oct	211	243	32	15.27%
Nov	226	302	76	33.73%
Dec	174	159	-15	-8.68%
Jan	157	143	-14	-8.68%
Feb	120	110	-10	-8.68%
Mar	155	141	-13	-8.68%
Total	**3,171**	**2,891**	**-280**	**-8.82%**

Wood Waste Tonnes	2019/2020	2020/2021	Difference	
Apr	363	13	-351	-96.53%
May	321	91	-231	-71.79%
Jun	313	389	76	24.27%
Jul	409	443	34	8.19%
Aug	370	398	28	7.70%
Sep	363	416	54	14.74%
Oct	270	375	105	38.93%
Nov	277	371	94	33.93%
Dec	276	257	-19	-6.92%
Jan	256	238	-18	-6.92%
Feb	271	253	-19	-6.92%
Mar	283	263	-20	-6.92%
Total	**3,773**	**3,507**	**-266**	**-7.05%**

Western Riverside Waste Authority | After 8 months of 2020/2021 | = Forecast Figures | Printed 06/01/2021 09:17

Tonnage	2019/2020 Outturn	2020/2021 Budget	2020/2021 Forecast	Difference to Budget Tonnes	Difference to Budget Percentage	2020/2021 £/Tonne	Budget 2020/2021 Cost £	Projected 2020/2021 Cost £	Projected 2020/2021 Variance £
Batteries	25	31	35	4	11%	61.00	1,908	2,125	217
Clinical Waste	88	89	81	-9	-9.6%	600.00	53,634	48,469	-5,166
Co-Mingled	68,100	66,978	70,800	3,822	5.7%	28.00	1,875,386	1,982,407	107,021
Detritus Waste	4,829	4,843	4,702	-142	-2.9%	83.00	402,006	390,259	-11,747
Electricals	887	861	856	-5	-0.6%	53.50	46,060	45,789	-271
Fridges	546	549	422	-127	-23.2%	52.00	28,528	21,919	-6,609
Gas Bottles	7	17	14	-3	-17.2%	139.50	2,433	2,015	-417
General Waste	285,297	283,180	279,778	-3,402	-1.2%	154.00	43,609,764	43,085,827	-523,937
Carpet	375	392	359	-33	-8.3%	154.00	60,350	55,324	-5,026
Green Waste	4,911	4,886	4,809	-76	-1.6%	103.00	503,210	495,334	-7,876
Inert Waste	1,699	1,816	1,719	-97	-5.3%	31.50	57,194	54,138	-3,056
Paint & Oil	17	18	11	-7	-38.4%	132.50	2,378	1,465	-914
Paper & Cardboard	1,385	1,364	1,500	137	10.0%	18.00	24,544	27,008	2,464
Scrap Metals	803	786	737	-49	-6.2%	-21.97	-17,260	-16,187	1,073
Textiles	254	257	265	7	2.8%	-199.50	-51,333	-52,780	-1,448
Tyres	10	7	8	1	8.6%	297.00	2,205	2,395	190
Wood	3,914	4,242	3,507	-735	-17.3%	110.50	468,704	387,482	-81,223
Grand Total	**373,146**	**370,316**	**369,602**	**-714**	**-0.2%**	**Sub-Total**	**47,069,711**	**46,532,988**	**-536,724**
Contamination	8,760	8,496	9,237	741	8.7%	154.00	1,308,384	1,422,554	114,170
						Grand Total	**48,378,095**	**47,955,542**	**-422,553**

Forecast Tonnes	2021/2022	2022/2023	2023/2024
Batteries	35	35	35
Clinical Waste	81	81	80
Co-Mingled	70,800	70,800	70,241
Detritus Waste	4,702	4,702	4,665
Electricals	856	856	849
Fridges	422	422	418
Gas Bottles	14	14	14
General Waste	279,778	279,778	277,566
Carpet	359	359	356
Green Waste	4,809	4,809	4,771
Inert Waste	1,719	1,719	1,705
Paint & Oil	11	11	11
Paper & Cardboard	1,500	1,500	1,489
Scrap Metals	737	737	731
Textiles	265	265	262
Tyres	8	8	8
Wood	3,507	3,507	3,479
Grand Total	**369,602**	**369,602**	**366,680**
Contamination	9,237	9,237	9,164

Co-Mingled Contamination	2016/2017	2017/2018	2018/2019	2019/2020	2020/2021
Apr	12.6%	15.0%	14.0%	11.4%	9.9%
May	12.6%	14.3%	12.2%	13.2%	13.1%
Jun	14.8%	13.2%	13.9%	13.1%	11.6%
Jul	12.9%	16.6%	15.1%	12.4%	14.3%
Aug	13.2%	16.9%	14.8%	14.0%	14.8%
Sep	13.5%	12.5%	16.3%	12.5%	15.3%
Oct	12.9%	14.3%	15.5%	12.5%	12.2%
Nov	13.7%	14.0%	13.6%	12.5%	13.2%
Dec	13.4%	15.4%	16.4%	12.7%	13.6%
Jan	15.1%	14.5%	14.7%	15.0%	13.6%
Feb	14.3%	13.4%	13.4%	13.9%	13.6%
Mar	14.8%	14.6%	12.8%	11.4%	13.6%
Average	13.6%	14.6%	14.6%	12.8%	13.6%
				Budget	12.7%

Working Days	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
Total	254	253	253	253	251
Diff from Year before		-1	0	0	-2
Change		-0.39%	0.00%	0.00%	-0.79%

General Waste Tonnes	2019/2020	2020/2021	Difference	
Apr	23,884	21,803	-2,081	-8.71%
May	24,958	22,524	-2,434	-9.75%
Jun	23,230	24,902	1,671	7.19%
Jul	25,797	24,620	-1,177	-4.56%
Aug	23,448	22,445	-1,003	-4.28%
Sep	23,293	24,247	953	4.09%
Oct	24,994	24,519	-475	-1.90%
Nov	23,913	24,531	617	2.58%
Dec	24,280	23,819	-461	-1.90%
Jan	23,562	23,160	-402	-1.70%
Feb	20,927	20,537	-390	-1.86%
Mar	23,012	22,673	-339	-1.47%
Total	**285,298**	**279,778**	**-5,520**	**-1.93%**

Co-Mingled Tonnes	2019/2020	2020/2021	Difference	
Apr	5,420	5,452	32	0.59%
May	5,780	5,609	-171	-2.97%
Jun	5,369	6,259	890	16.57%
Jul	5,976	6,140	164	2.75%
Aug	5,176	5,152	-24	-0.47%
Sep	5,499	5,705	206	3.74%
Oct	5,953	6,120	167	2.81%
Nov	5,660	6,032	372	6.57%
Dec	6,279	6,533	254	4.04%
Jan	6,177	6,482	305	4.94%
Feb	5,122	5,343	221	4.32%
Mar	5,689	5,974	285	5.01%
Total	**68,099**	**70,800**	**2,701**	**3.97%**

Detritus Waste Tonnes	2019/2020	2020/2021	Difference	
Apr	309	313	4	1.29%
May	358	340	-18	-4.96%
Jun	348	351	3	0.82%
Jul	346	321	-25	-7.33%
Aug	392	352	-40	-10.18%
Sep	412	339	-73	-17.72%
Oct	481	583	102	21.21%
Nov	746	696	-50	-6.72%
Dec	472	467	-5	-1.09%
Jan	345	336	-9	-2.55%
Feb	346	336	-10	-3.01%
Mar	273	268	-5	-1.86%
Total	**4,829**	**4,702**	**-127**	**-2.62%**

Co-mingled Contamination Tonnes	2019/2020	2020/2021	Difference	
Apr	616	540	-76	-12.30%
May	762	737	-25	-3.34%
Jun	704	727	23	3.32%
Jul	738	876	138	18.68%
Aug	724	763	39	5.42%
Sep	686	872	186	27.07%
Oct	743	748	5	0.73%
Nov	705	795	89	12.67%
Dec	797	852	54	6.82%
Jan	925	848	-77	-8.32%
Feb	710	698	-13	-1.79%
Mar	649	782	133	20.51%
Total	**8,760**	**9,237**	**478**	**5.45%**

Green Waste Tonnes	2019/2020	2020/2021	Difference	
Apr	399	50	-349	-87.44%
May	465	360	-105	-22.55%
Jun	454	542	88	19.48%
Jul	423	458	35	8.35%
Aug	431	408	-23	-5.23%
Sep	396	461	65	16.36%
Oct	350	384	34	9.66%
Nov	514	539	25	4.83%
Dec	397	377	-20	-4.95%
Jan	674	845	171	25.35%
Feb	210	199	-11	-5.34%
Mar	197	185	-13	-6.35%
Total	**4,911**	**4,809**	**-101**	**-2.07%**

Wood Waste Tonnes	2019/2020	2020/2021	Difference	
Apr	395	13	-383	-96.81%
May	348	91	-258	-73.98%
Jun	333	389	56	16.77%
Jul	434	443	9	2.06%
Aug	389	398	10	2.48%
Sep	380	416	36	9.58%
Oct	270	375	105	38.93%
Nov	277	371	94	33.93%
Dec	276	257	-19	-6.92%
Jan	256	238	-18	-7.05%
Feb	271	253	-19	-6.92%
Mar	283	263	-20	-6.92%
Total	**3,913**	**3,507**	**-406**	**-10.38%**

Local Authority Collected Waste (Tonnes)

Forecast after 8 months of 2020/2021 | Printed 06/01/2021 09:20

	HF	KC	LA	WA	HWRC	Total	Share	Adjusted for Contamination	Share
Co-Mingled Recyclables	12,469	12,464	22,135	23,437	296	70,800	19%	61,563	17%
Detritus Waste	446	775	576	2,905	-	4,702	1%	4,702	1%
General Waste	55,614	46,521	88,722	80,090	8,831	279,778	76%	289,015	78%
Green Waste	267	510	690	451	2,891	4,809	1%	4,809	1%
Wood Waste	-	-	-	-	3,507	3,507	1%	3,507	1%
Other Waste	159	85	714	148	4,900	6,006	2%	6,006	2%
TOTAL WASTE	68,955	60,354	112,837	107,032	20,424	369,602	100%	369,602	100%
Co-Mingled Contamination	1,632	1,390	3,163	3,012	40	9,237			

Local Authority Collected Waste (£)

	£/T	HF	KC	LA	WA	HWRC	Total	Share	Adjusted for Contamination	Share
Co-Mingled Recyclables	28.00	349,119	348,982	619,774	656,243	8,290	1,982,407	4%	1,982,407	4%
Detritus Waste	83.00	37,024	64,307	47,782	241,145	-	390,259	1%	390,259	1%
General Waste	154.00	8,564,633	7,164,185	13,663,208	12,333,901	1,359,899	43,085,827	93%	44,508,381	93%
Green Waste	103.00	27,491	52,547	71,097	46,433	297,766	495,334	1%	495,334	1%
Wood Waste	110.50	-	-	-	-	387,482	387,482	1%	387,482	1%
Other Waste		14,752	5,100	21,829	40,742	109,257	191,679	0%	191,679	0%
SUB-TOTAL COST		9,244,336	7,849,167	14,910,735	13,782,387	2,168,916	46,532,988	100%	47,955,542	100%
Co-Mingled Contamination	154.00	251,318	214,046	487,044	463,923	6,223	1,422,554			
						TOTAL COST	47,955,542			

Local Authority Collected Waste (Tonnes) Adjusted for Contamination

	HF	KC	LA	WA	HWRC	WRWA
Co-Mingled Recyclables	10,837	11,074	18,972	20,425	256	61,563
Detritus Waste	446	775	576	2,905	-	4,702
General Waste	57,246	47,911	91,885	83,103	8,871	289,015
Green Waste	267	510	690	451	2,891	4,809
Wood Waste	-	-	-	-	3,507	3,507
Other Waste	159	85	714	148	4,900	6,006
TOTAL WASTE	68,955	60,354	112,837	107,032	20,424	369,602

Local Authority Collected Waste (Tonnes) Other Estimated Adjustments

	HF	KC	LA	WA	HWRC	WRWA
HWRC Recycling Tonnage assigned to Councils	2,188	2,653	3,032	3,680	- 11,553	
Mixed Food & Garden Waste			4,500			4,500
Other Third Party Recycling	350	250	2050	500		3,150
TOTAL Local Authority Collected Waste	71,493	63,257	122,419	111,212	8,871	377,252

Household Waste Data from Waste DataFlow

Forecast after 1 Quarters of 2020/2021

* Allocated to Consituent Councils

	HF	KC	LA	WA	HWRC	WRWA
Residual Household Waste	32,679	38,240	51,536	80,330	8,871	211,656
HH Dry Recycling Tonnage	10,705	10,293	20,763	21,716	*	63,478
HH Compost Tonnage	677	1,564	8,146	1,749	*	12,135
Total Household Waste	44,061	50,097	80,445	103,795	8,871	287,269
HH Waste Sent for Recycling or Composting	11,382	11,857	28,909	23,465	*	75,613
Non-Household Residual Waste	24,567	9,671	40,349	2,772	-	77,360
Non-Household Recycling & Composting	2,865	3,489	1,625	4,644	-	12,624
Total Non-Household Waste	27,432	13,160	41,974	7,417	-	89,984
Total Local Authority Collected Waste	71,493	63,257	122,419	111,212	8,871	377,252

Demographics

	HF	KC	LA	WA	HWRC	WRWA
Population	185,426	156,197	325,917	326,474	994,014	994,014
Number of Households	89,880	89,160	143,540	146,290	468,870	468,870
Persons per Household	2.06	1.75	2.27	2.23	2.12	2.12
HH Waste per HH (kg/week)	9.4	10.8	10.8	13.6	0.4	11.8
Residual HH Waste per HH (kg/week)	7.0	8.2	6.9	10.6	0.4	8.7
Recycled/Composted HH Waste per HH (kg/week)	2.4	2.6	3.9	3.1	*	3.1
HH Waste per Resident (kg/week)	4.6	6.2	4.7	6.1	0.2	5.6
Residual HH Waste per Resident (kg/week)	3.4	4.7	3.0	4.7	0.2	4.1
Recycled/Composted HH Waste per Resident (kg/week)	1.2	1.5	1.7	1.4	*	1.5

Recycling Performance

	HF	KC	LA	WA	HWRC	WRWA
HH Dry Recycling %	24.3%	20.5%	25.8%	20.9%	*	22.1%
HH Compost %	1.5%	3.1%	10.1%	1.7%	*	4.2%
HH Recycling/composting %	25.8%	23.7%	35.9%	22.6%	*	26.3%
Municipal Recycling/composting %	19.9%	24.3%	24.9%	25.3%	*	23.4%

After 8 months of 2020/2021

General Waste Delivered (Tonnes)

	2016/2017	2017/2018	2018/2019	2019/2020	TO DATE 2020/2021	FORECAST 2020/2021	Annual Change Tonnes	Annual Change Percent	2020/2021 Budget Tonnes	Budget Change Tonnes	Budget Change Percent
HF	60,602	58,478	57,772	56,021	37,611	55,614	- 407	-0.73%	55,421	193	0.35%
KC	60,292	59,730	59,581	58,209	31,696	46,521	- 11,689	-20.08%	57,965	- 11,444	-19.74%
LA	92,784	89,451	89,226	86,536	59,911	88,722	2,186	2.53%	86,356	2,366	2.74%
WA	79,034	77,251	76,028	75,666	53,968	80,090	4,425	5.85%	74,482	5,608	7.53%
WRWA	11,792	10,749	9,713	8,865	6,404	8,831	- 35	-0.39%	8,957	- 126	-1.41%
Total	304,504	295,660	292,321	285,298	189,589	279,778	- 5,520	-1.93%	283,180	- 3,402	-1.20%
Change		- 8,844	- 3,339	- 7,023		- 5,520					
Percentage Change		-2.90%	-1.13%	-2.40%		-1.93%					

Co-Mingled Waste Delivered (Tonnes)

	2016/2017	2017/2018	2018/2019	2019/2020	TO DATE 2020/2021	FORECAST 2020/2021	Annual Change Tonnes	Annual Change Percent	2020/2021 Budget Tonnes	Budget Change Tonnes	Budget Change Percent
HF	11,520	11,305	11,146	11,703	8,246	12,469	766	6.54%	11,543	925	8.01%
KC	16,307	15,889	16,087	15,961	8,399	12,464	- 3,497	-21.91%	15,995	- 3,531	-22.08%
LA	18,388	19,902	19,858	19,543	14,441	22,135	2,592	13.26%	19,078	3,057	16.02%
WA	20,180	19,900	20,173	20,355	15,173	23,437	3,083	15.15%	19,774	3,664	18.53%
WRWA	339	437	601	538	209	296	- 242	-44.98%	588	- 292	-49.69%
Total	66,733	67,433	67,864	68,099	46,468	70,800	2,701	3.97%	66,978	3,822	5.71%
Change		700	431	235		2,701					
Percentage Change		1.05%	0.64%	0.35%		3.97%					

Co-Mingled Contamination (Percentage)

	2016/2017	2017/2018	2018/2019	2019/2020	TO DATE 2020/2021	FORECAST 2020/2021	Change in Percentage Point
HF	14.02%	14.09%	15.19%	13.62%	13.09%	13.09%	-0.53%
KC	11.86%	12.23%	11.66%	10.64%	11.15%	11.15%	0.51%
LA	13.90%	16.46%	16.40%	14.31%	14.29%	14.29%	-0.02%
WA	14.73%	14.80%	14.14%	12.78%	12.85%	12.85%	0.07%
WRWA	13.64%	14.59%	14.57%	12.84%	13.65%	13.65%	0.80%

Co-Mingled Contamination (Tonnes)

	2016/2017	2017/2018	2018/2019	2019/2020	TO DATE 2020/2021	FORECAST 2020/2021	Annual Change Tonnes	Annual Change Percent	2017/2018 Budget Percentage	2020/2021 Budget Tonnes	Budget Change Tonnes	Budget Change Percent
HF	1,616	1,593	1,693	1,594	1,079	1,632	38	2.37%	13.5%	1,555	77	4.95%
KC	1,934	1,943	1,875	1,699	937	1,390	- 309	-18.18%	10.6%	1,690	- 300	-17.76%
LA	2,556	3,276	3,257	2,796	2,063	3,163	367	13.11%	14.0%	2,672	491	18.36%
WA	2,973	2,946	2,852	2,602	1,950	3,012	411	15.79%	12.7%	2,504	508	20.31%
WRWA	46	64	88	69	29	40	- 29	-41.54%	12.7%	75	- 35	-46.12%
Total	9,124	9,821	9,764	8,760	6,058	9,237	478	5.45%	12.7%	8,496	741	8.73%
Change		697	- 57	- 1,005		478						
Percentage Change		7.64%	-0.58%	-10.29%		5.45%						

Green Waste Delivered (Tonnes)

	2016/2017	2017/2018	2018/2019	2019/2020	TO DATE 2020/2021	FORECAST 2020/2021	Annual Change Tonnes	Annual Change Percent	2020/2021 Budget Tonnes	Budget Change Tonnes	Budget Change Percent
HF	114	115	121	83	5	267	184	220.33%	4	263	7214.57%
KC	359	387	429	475	305	510	35	7.45%	463	48	10.30%
LA	241	298	546	733	422	690	- 43	-5.80%	736	- 46	-6.19%
WA	552	503	340	449	134	451	2	0.41%	498	- 47	-9.42%
WRWA	3,217	3,065	3,190	3,171	2,338	2,891	- 280	-8.82%	3,186	- 295	-9.26%
Total	4,483	4,368	4,626	4,911	3,203	4,809	- 101	-2.07%	4,886	- 76	-1.57%
Change		- 115	257	285		- 101					
Percentage Change		-2.57%	5.89%	6.16%		-2.07%					

Clinical Waste Delivered (Tonnes)

	2016/2017	2017/2018	2018/2019	2019/2020	TO DATE 2020/2021	FORECAST 2020/2021	Annual Change Tonnes	Annual Change Percent	2020/2021 Budget Tonnes	Budget Change Tonnes	Budget Change Percent
HF	30	27	23	18	11	15	-3	-14.83%	19	-3	-16.82%
KC	3	2	2	1	1	1	-0	-9.25%	1	-0	-24.19%
LA	2	1	3	3	2	4	1	18.16%	4	-0	-4.79%
WA	60	65	64	66	41	61	-5	-8.19%	66	-5	-7.55%
WRWA	-	-	-	-	-	-	-	0.00%	-	-	0.00%
Total	95	96	92	88	55	81	-8	-8.68%	89	-9	-9.63%
Change		1	-4	-3		-8					
Percentage Change		0.57%	-4.14%	-3.51%		-8.68%					

Detritus Waste Delivered (Tonnes)

	2016/2017	2017/2018	2018/2019	2019/2020	TO DATE 2020/2021	FORECAST 2020/2021	Annual Change Tonnes	Annual Change Percent	2020/2021 Budget Tonnes	Budget Change Tonnes	Budget Change Percent
HF	813	733	611	449	308	446	-2	-0.55%	411	35	8.64%
KC	536	499	623	1,021	561	775	-246	-24.09%	1,222	-447	-36.57%
LA	587	610	760	518	398	576	57	11.03%	518	58	11.23%
WA	2,482	2,539	2,992	2,841	2,027	2,905	64	2.27%	2,694	212	7.86%
WRWA	-	-	-	-	-	-	-	0.00%	-	-	0.00%
Total	4,418	4,380	4,986	4,829	3,295	4,702	-127	-2.62%	4,843	-142	-2.92%
Change		-38	606	-157		-127					
Percentage Change		-0.85%	13.82%	-3.15%		-2.62%					

Battery Waste Delivered (Tonnes)

	2016/2017	2017/2018	2018/2019	2019/2020	TO DATE 2020/2021	FORECAST 2020/2021	Annual Change Tonnes	Annual Change Percent	2020/2021 Budget Tonnes	Budget Change Tonnes	Budget Change Percent
HF	1	1	1	1	0	0	-0	-42.80%	1	-0	-49.02%
KC	-	-	-	-	-	-	-	0.00%	-	-	0.00%
LA	-	-	-	-	-	-	-	0.00%	-	-	0.00%
WA	0	-	-	-	-	-	-	0.00%	-	-	0.00%
WRWA	25	22	15	24	20	34	10	41.62%	31	4	12.69%
Total	25	23	15	25	20	35	10	39.59%	31	4	11.36%
Change		-2	-8	10		10					
Percentage Change		-9.16%	-33.48%	63.14%		39.59%					

Electrical Waste Delivered (Tonnes)

	2016/2017	2017/2018	2018/2019	2019/2020	TO DATE 2020/2021	FORECAST 2020/2021	Annual Change Tonnes	Annual Change Percent	2020/2021 Budget Tonnes	Budget Change Tonnes	Budget Change Percent
HF	44	15	9	20	9	23	3	12.38%	11	12	103.50%
KC	49	27	33	26	22	39	12	46.96%	21	18	87.50%
LA	194	172	122	113	52	62	-52	-45.69%	94	-33	-34.61%
WA	3	10	3	2	3	4	2	146.56%	2	2	118.04%
WRWA	806	738	751	726	503	729	3	0.37%	733	-4	-0.58%
Total	1,095	964	917	888	589	856	-32	-3.61%	861	-5	-0.59%
Change		-131	-47	-29		-32					
Percentage Change		-11.96%	-4.83%	-3.19%		-3.61%					

Fridge Waste Delivered (Tonnes)

	2016/2017	2017/2018	2018/2019	2019/2020	TO DATE 2020/2021	FORECAST 2020/2021	Annual Change Tonnes	Annual Change Percent	2020/2021 Budget Tonnes	Budget Change Tonnes	Budget Change Percent
HF	101	94	91	89	57	84	-5	-5.64%	85	-1	-1.72%
KC	64	61	64	51	29	42	-9	-17.47%	54	-12	-22.98%
LA	212	182	179	174	113	151	-22	-12.92%	160	-9	-5.51%
WA	123	100	96	153	53	67	-86	-56.16%	172	-105	-61.13%
WRWA	86	65	78	79	52	77	-2	-2.54%	76	1	1.30%
Total	587	503	507	546	304	422	-124	-22.75%	549	-127	-23.17%
Change		-83	4	39		-124					
Percentage Change		-14.19%	0.76%	7.60%		-22.75%					

Gas Bottle Waste Delivered (Tonnes)

	2016/2017	2017/2018	2018/2019	2019/2020	TO DATE 2020/2021	FORECAST 2020/2021	Annual Change Tonnes	Annual Change Percent	2020/2021 Budget Tonnes	Budget Change Tonnes	Budget Change Percent
HF	1	2	1	1	0	1	0	41.83%	0	0	139.62%
KC	0	1	1	1	1	1	0	9.74%	1	0	18.60%
LA	2	4	3	4	1	1	-3	-76.12%	3	-2	-68.36%
WA	1	2	1	1	1	3	3	338.17%	0	3	1045.06%
WRWA	-	19	15	-	8	8	8	0.00%	13	-4	-34.37%
Total	5	27	21	6	11	14	8	127.16%	17	-3	-17.15%
Change		22	-6	-15		8					
Percentage Change		461.98%	-21.99%	-70.03%		127.16%					

Carpet Waste Delivered (Tonnes)

	2016/2017	2017/2018	2018/2019	2019/2020	TO DATE 2020/2021	FORECAST 2020/2021	Annual Change Tonnes	Annual Change Percent	2020/2021 Budget Tonnes	Budget Change Tonnes	Budget Change Percent
HF	-	-	-	-	-	-	-	0.00%	-	-	0.00%
KC	-	-	-	-	-	-	-	0.00%	-	-	0.00%
LA	-	-	-	-	-	-	-	0.00%	-	-	0.00%
WA	-	-	-	-	-	-	-	0.00%	-	-	0.00%
WRWA	-	-	269	375	247	359	-16	-4.22%	392	-33	-8.33%
Total	-	-	269	375	247	359	-16	-4.22%	392	-33	-8.33%
Change		-	269	106		-16					
Percentage Change				39.28%		-4.22%					

Inert Waste Delivered (Tonnes)

	2016/2017	2017/2018	2018/2019	2019/2020	TO DATE 2020/2021	FORECAST 2020/2021	Annual Change Tonnes	Annual Change Percent	2020/2021 Budget Tonnes	Budget Change Tonnes	Budget Change Percent
HF	-	-	-	5	-	5	0	0.20%	-	5	0.00%
KC	2	-	-	-	2	2	2	0.00%	-	2	0.00%
LA	10	-	1	2	-	-	-2	-100.00%	2	-2	-100.00%
WA	4	23	0	15	0	1	-15	-96.07%	11	-10	-94.37%
WRWA	1,061	1,212	1,624	1,677	1,278	1,710	33	1.97%	1,803	-93	-5.17%
Total	1,076	1,235	1,625	1,700	1,281	1,719	19	1.09%	1,816	-97	-5.34%
Change		158	390	75		19					
Percentage Change		14.72%	31.62%	4.61%		1.09%					

Oil/Paint Waste Delivered (Tonnes)

	2016/2017	2017/2018	2018/2019	2019/2020	TO DATE 2020/2021	FORECAST 2020/2021	Annual Change Tonnes	Annual Change Percent	2020/2021 Budget Tonnes	Budget Change Tonnes	Budget Change Percent
HF	-	-	0	-	-	-	-	0.00%	-	-	0.00%
KC	-	-	-	-	-	-	-	0.00%	-	-	0.00%
LA	-	-	-	-	-	-	-	0.00%	-	-	0.00%
WA	-	0	-	-	-	-	-	0.00%	-	-	0.00%
WRWA	17	15	17	17	9	11	-6	-36.25%	18	-7	-38.41%
Total	17	15	17	17	9	11	-6	-36.25%	18	-7	-38.41%
Change		-1	1	0		-6					
Percentage Change		-8.08%	9.04%	2.73%		-36.25%					

Paper/Cardboard Waste Delivered (Tonnes)

	2016/2017	2017/2018	2018/2019	2019/2020	TO DATE 2020/2021	FORECAST 2020/2021	Annual Change Tonnes	Annual Change Percent	2020/2021 Budget Tonnes	Budget Change Tonnes	Budget Change Percent
HF	-	-	-	-	-	-	-	0.00%	-	-	0.00%
KC	-	-	-	-	-	-	-	0.00%	-	-	0.00%
LA	321	484	439	423	285	434	11	2.65%	387	48	12.29%
WA	-	-	-	-	2	2	2	0.00%	-	2	0.00%
WRWA	806	827	793	962	704	1,065	103	10.72%	977	88	8.99%
Total	1,127	1,311	1,232	1,385	990	1,500	116	8.36%	1,364	137	10.04%
Change		185	-79	152		116					
Percentage Change		16.39%	-6.02%	12.35%		8.36%					

Scrap Metal Waste Delivered (Tonnes)

	2016/2017	2017/2018	2018/2019	2019/2020	TO DATE 2020/2021	FORECAST 2020/2021	Annual Change Tonnes	Annual Change Percent	2020/2021 Budget Tonnes	Budget Change Tonnes	Budget Change Percent
HF	11	13	4	19	7	29	10	51.78%	5	24	462.26%
KC	1	1	1	0	-	0	0	0.20%	-	0	0.00%
LA	150	115	112	114	45	56	-58	-50.90%	122	-66	-54.14%
WA	0	2	0	4	7	10	7	175.73%	0	10	4584.88%
WRWA	697	687	721	666	458	641	-25	-3.77%	658	-17	-2.62%
Total	859	818	837	803	517	737	-67	-8.28%	786	-49	-6.22%
Change		-42	20	-34		-67					
Percentage Change		-4.86%	2.42%	-4.08%		-8.28%					

Textile Waste Delivered (Tonnes)

	2016/2017	2017/2018	2018/2019	2019/2020	TO DATE 2020/2021	FORECAST 2020/2021	Annual Change Tonnes	Annual Change Percent	2020/2021 Budget Tonnes	Budget Change Tonnes	Budget Change Percent
HF	-	-	-	-	-	-	-	0.00%	-	-	0.00%
KC	-	-	-	-	-	-	-	0.00%	-	-	0.00%
LA	-	-	-	-	-	-	-	0.00%	-	-	0.00%
WA	-	-	-	-	-	-	-	0.00%	-	-	0.00%
WRWA	209	205	234	254	184	265	11	4.22%	257	7	2.82%
Total	209	205	234	254	184	265	11	4.22%	257	7	2.82%
Change		- 5	30	20		11					
Percentage Change		-2.25%	14.42%	8.46%		4.22%					

Tyre Waste Delivered (Tonnes)

	2016/2017	2017/2018	2018/2019	2019/2020	TO DATE 2020/2021	FORECAST 2020/2021	Annual Change Tonnes	Annual Change Percent	2020/2021 Budget Tonnes	Budget Change Tonnes	Budget Change Percent
HF	0	0	0	1	0	1	0	33.53%	-	1	0.00%
KC	0	0	-	-	-	-	-	0.00%	-	-	0.00%
LA	8	12	12	8	4	6	- 2	-19.86%	7	- 1	-8.86%
WA	2	1	1	1	1	1	1	84.85%	1	1	73.09%
WRWA	-	-	0	-	-	-	-	0.00%	-	-	0.00%
Total	11	13	13	9	5	8	- 1	-8.78%	7	1	8.63%
Change		2	1	- 5		- 1					
Percentage Change		13.45%	4.52%	-34.03%		-8.78%					

Wood Waste Delivered (Tonnes)

	2016/2017	2017/2018	2018/2019	2019/2020	TO DATE 2020/2021	FORECAST 2020/2021	Annual Change Tonnes	Annual Change Percent	2020/2021 Budget Tonnes	Budget Change Tonnes	Budget Change Percent
HF	-	-	-	-	-	-	-	0.00%	-	-	0.00%
KC	-	1	1	1	-	-	- 1	-100.00%	1	- 1	-100.00%
LA	273	245	251	140	-	-	- 140	-100.00%	200	- 200	-100.00%
WA	-	-	-	-	-	-	-	0.00%	-	-	0.00%
WRWA	3,223	3,165	3,474	3,773	2,496	3,507	- 266	-7.05%	4,041	- 535	-13.23%
Total	3,496	3,411	3,726	3,913	2,496	3,507	- 406	-10.38%	4,242	- 735	-17.33%
Change		- 86	315	187		- 406					
Percentage Change		-2.45%	9.24%	5.02%		-10.38%					

Total Waste Delivered (Tonnes)

	2016/2017	2017/2018	2018/2019	2019/2020	TO DATE 2020/2021	FORECAST 2020/2021	Annual Change Tonnes	Annual Change Percent	2020/2021 Budget Tonnes	Budget Change Tonnes	Budget Change Percent
HF	73,236	70,785	69,779	68,410	46,254	68,955	545	0.80%	67,500	1,455	2.15%
KC	77,613	76,597	76,822	75,746	41,016	60,354	- 15,391	-20.32%	75,721	- 15,367	-20.29%
LA	113,172	111,477	111,510	108,311	75,674	112,837	4,525	4.18%	107,665	5,172	4.80%
WA	102,442	100,395	99,698	99,551	71,409	107,032	7,481	7.51%	97,699	9,334	9.55%
WRWA	22,277	21,208	21,494	21,128	14,910	20,424	- 704	-3.33%	21,731	- 1,307	-6.01%
Total	388,741	380,462	379,303	373,146	249,263	369,602	- 3,544	-0.95%	370,316	- 714	-0.19%
Change		- 8,279	- 1,159	- 6,157		- 3,544					
Percentage Change		-2.13%	-0.30%	-1.62%		-0.95%					

Western Riverside Waste Authority

Carbon Metric Targets – Waste Management Activities

Draft Interim Report







Report for

Sharon Ross
Deputy General Manager
Western Riverside Waste Authority
Smugglers Way
SW18 1JS

Main contributors

Jennifer Allen
Kostas Patapatiou
Harry Doyle

Issued by



.....
Jennifer Allen

Approved by



.....
Richard Garfield

Wood Group UK Limited

Canon Court
Abbey Lawn
Abbey Foregate
Shrewsbury SY2 5DE
United Kingdom
Tel +44 (0) 1743 342 000

Doc Ref. 42926-WOOD-XX-XX-RP-WM-0001_S3_P02

\\sal-fs12.global.amec.com\shared\projects\42926 crp western riverside waste carbon targets\deliver stage\d design_technical\reports\42926-wood-xx-xx-rp-wm-0001_s3_p02.docx

Draft report disclaimer

This report has been prepared in a working draft form and has not been finalised or formally reviewed. As such it should be taken as an indication only of the material and conclusions that will form the final report. Any calculations or findings presented here may be changed or altered and should not be taken to reflect Wood's opinions or conclusions.

Copyright and non-disclosure notice

The contents and layout of this report are subject to copyright owned by Wood (© Wood Group UK Limited 2020) save to the extent that copyright has been legally assigned by us to another party or is used by Wood under licence. To the extent that we own the copyright in this report, it may not be copied or used without our prior written agreement for any purpose other than the purpose indicated in this report. The methodology (if any) contained in this report is provided to you in confidence and must not be disclosed or copied to third parties without the prior written agreement of Wood. Disclosure of that information may constitute an actionable breach of confidence or may otherwise prejudice our commercial interests. Any third party who obtains access to this report by any means will, in any event, be subject to the Third Party Disclaimer set out below.

Third party disclaimer

Any disclosure of this report to a third party is subject to this disclaimer. The report was prepared by Wood at the instruction of, and for use by, our client named on the front of the report. It does not in any way constitute advice to any third party who is able to access it by any means. Wood excludes to the fullest extent lawfully permitted all liability whatsoever for any loss or damage howsoever arising from reliance on the contents of this report. We do not however exclude our liability (if any) for personal injury or death resulting from our negligence, for fraud or any other matter in relation to which we cannot legally exclude liability.

Management systems

This document has been produced by Wood Group UK Limited in full compliance with our management systems, which have been certified to ISO 9001, ISO 14001 and ISO 45001 by Lloyd's Register.

Document revisions

No.	Details	Date
P01	Draft interim report	05/01/2021
P02	Draft interim report – updated document	11/01/2021

Executive summary

Purpose of this report

This interim report has been prepared to detail the progress made to date in assessing the carbon impact of the Authority's and its constituent councils' waste management activities. The Authority is interested in the global warming impact of its activities, how it may have altered historically over time, and what initiatives the Authority and its constituent councils might focus on to best lessen any future impact.

Accurate data gathering has formed a robust baseline model, and the options identification and assumptions have been formed through the direction of national policies, with input from both the Authority and Wood to finalise the assumptions in order to inform realistic output for future settings.

Historical trends

Using data back to 2002, historical trends have been identified. Recycling rates for the Authority and the individual authorities increased significantly between 2002 and 2004, which was a direct result of the introduction of Borough-wide collection services or service changes.

Recycling material tonnages have seen paper, glass and card remain the most collected materials, although paper has fell in recent years which may be due to the ongoing transition away from paper to digital media. Glass has overtaken paper as the most collected material in recent years.

In Hammersmith & Fulham, the overall recycling rate for household collected waste increased from 20.5% in 2001 to 24.9% in 2019, peaking at 26.2% in 2011. Residual waste tonnages steadily fell by over 30% over the same period.

In the Royal Borough of Kensington and Chelsea, the overall recycling rate for household collected waste has increased significantly from 1.5% in 2001 to 26.4% in 2019, while residual waste collection tonnages steadily fell by almost half.

In Wandsworth, the overall recycling rate for household collected waste increased from 2.2% to 20.4% between 2001 and 2019, with a marked increase from 2.2% in 2003 to 13.4% in 2004. The recycling rate peaked at 25.6% in 2011, decreasing to 19.3% in 2015. Since 2015, the recycling rate has gradually increased to 20.4% in 2019.

In Lambeth, the overall recycling rate for household collected waste increased from 3.6% to 31.6% between 2001 and 2019. The most significant increase was seen from 2.2% in 2003 to 13.4% in 2004. Paper, glass and garden waste have been the top three collected materials over time with putrescibles the most collected material in 2019 driven by the separate kerbside food waste collections introduced in 2013/2014. Residual waste collection tonnages reduced steadily by almost half between 2001 and 2019. Most of this decrease was between 2003 and 2011 where residual waste collection tonnage decreased by 37%.

Baseline model

Using the data provided by the Authority (and pre-agreed, evidence-based assumptions) a detailed baseline model has been developed, which includes historical (from 2002 onwards), current and future compositional data and waste flows for recycling, residual waste and total waste collected, detailed by material type. The model includes information on the number of households and quantities of waste generated per household. The model has been developed to provide data at constituent council level, as well as providing a consolidated Authority wide view.

It was agreed with the Authority that all municipal waste collection services were to be included in the waste flow modelling apart from street cleansing and markets waste. The assessment has primarily focused on the waste treatment/disposal delivery of the service, although high level estimates of kerbside resources and costs required to deliver the baseline (and thereafter the options) have also been calculated.

Assumptions

Waste tonnages by source and material type were obtained from WasteDataFlow (WDF) data provided by the Authority. WDF provides a breakdown of recyclable materials collected by source, split by kerbside and HWRC/ CA site, and by household and commercial sources.

To obtain a detailed breakdown of the comingled materials collected at the kerbside, composition studies carried out by the Authority over regular intervals were used. Where the composition of comingled recycling in a year was not available, a proxy composition was obtained by interpolating the values between available data intervals.

A similar approach was undertaken to estimate the composition of residual waste, in order to understand the breakdown of the type of materials and their tonnages in the total waste arisings and ensure that the capture rate of materials in the options modelling is held at realistic levels.

Operational assumptions relating to the kerbside services were provided by the constituent councils in proformas issues by Wood. Details obtained include:

- Collection service arrangements operated by each constituent council, such as the number of kerbside services operated and the household numbers and types on each service;
- Types and numbers of resources required to deliver each service (collection crew, vehicles and containers);
- Logistical details associated with each service (travel logistics); and
- Other useful operational details, such as the service participation and container set-out rates.

Material processing costs, sales income and other cost assumptions are being finalised and will be provided in the final report.

Options identification

In developing the options, a review of policy documents was undertaken including the national Resources and Waste Strategy, The London Mayor's Environment Strategy and the respective local borough policies. Some of the policies may become mandatory and/or may impact consumption patterns and products available to consumers, whereas some of the policies are unlikely to be enforced. Not all initiatives have been taken into account at the modelling stage due to uncertainties and lack of evidence and data to substantiate the approach.

The following waste management options were selected for modelling, as agreed with the Authority:

- Option 1: waste reduction per capita
- Option 2: increase in recycling rate
- Option 3: Separate food waste collection to AD vs Separate food collection to IVC
- Option 4: Separate textiles collection
- Option 5: Reduction of packaging waste (DRS assessment)
- Option 6: Low carbon transport options

- Option 7: Alternate weekly collections (AWC)
- Option 8: Separate garden waste collection

Waste flow modelling

The waste flow modelling of the options has been completed for the constituent councils and the Authority as a whole. The option waste flows have been developed by applying sets of assumptions on the calculated baseline flows, which are outlined in table 6.8 of this report.

The duration of the waste flow model is up to 2035. Future waste growth has been incorporated into the models based on housing growth rates, and the composition, contamination, yield and capture rate data of the last full financial year. Capture and contamination rates for materials targeted for dry recycling have been estimated over this time period.

Section 6.3 of this report provides waste flow modelling output for each option, presented for the Authority area as a whole, and documenting the trends in waste flow in line with the agreed assumptions.

Next steps

This report also details the next stages of the project which will include a cost and resource assessment. The resource and cost modelling for the options is currently being developed; all clarifications and data were received from the constituent councils on 4th January which will now enable its finalisation. The cost model will utilise key service information to produce a strategic cost assessment of the options.

The carbon modelling is yet to be undertaken but will utilise WRATE software; a tool for modelling the carbon and environmental impact of waste management services. WRATE (a copy of which is held by Wood under licence) allows the evaluation of the environmental impact of waste management options, from collection through to treatment / disposal, supporting a comprehensive assessment of options based on performance and environmental impact.

Following carbon impact modelling and identification of how the Authority may reduce its carbon impact we will recommend SMART carbon targets for the preferred option for each of the Boroughs, and the identification of plans for how these might be achieved so as to lessen the carbon impact of waste management in the future. The SMART targets will cover performance, carbon and cost, which the authority can easily monitor.

Contents

1. Introduction 9

1.2 Interim report 9

2. Methodology 10

3. Key Performance Indicators 11

4. Historical trends 12

4.2 Historical trends across the Authority area 12
Recycling rate and collected waste tonnages 12
Recycling material tonnages 13
Residual material tonnages 15

4.3 Hammersmith & Fulham 15
Recycling rate and collected waste tonnages 15
Recycling material tonnages 16
Residual material tonnages 18

4.4 Royal Borough of Kensington & Chelsea 18
Recycling rate and collected waste tonnages 18
Recycling material tonnages 19
Residual material tonnages 21

4.5 Wandsworth 21
Recycling rate and collected waste tonnages 21
Recycling material tonnages 22
Residual material tonnages 24

4.6 Lambeth 24
Recycling rate and collected waste tonnages 24
Recycling material tonnages 25
Residual material tonnages 27

5. Baseline modelling 28

5.2 Waste Flow Modelling 28

5.3 Cost Modelling 28

5.4 Baseline model assumptions 29
Waste yield assumptions 30
Operational assumptions 30
Materials processing costs and sales income assumptions 30
Other cost assumptions 30

5.5 Carbon Impact 31

6. Options Modelling 32

6.1 Options Identification 32
Option 1 Waste reduction per capita 32

Option 2 Increase in recycling rate 32
Option 3 Separate food waste collection to AD/IVC vs Status Quo 34
Option 4 Separate textiles collection 34
Option 5 Reduction of packaging waste (DRS assessment) 35
Option 6 Low carbon transport options 35
Option 7 Alternate weekly collections (AWC) 36
Option 8 Separate Garden Waste Collection 36
Options for modelling 36

6.2 Options modelling 37
Option assumptions 37

6.3 Waste Flow Modelling Outputs 41
Option 1 Waste reduction per capita 41
Option 2 Increase in recycling rate 44
Option 3 Separate food waste collection to AD/IVC vs Status Quo 47
Option 4 Separate textiles collection 50
Option 5 Reduction of packaging waste (DRS assessment) 53
Option 7 Alternate weekly collections (AWC) 56
Option 8 Separate Garden Waste Collection 59

6.4 Cost and carbon modelling outputs 62

7. Next steps 64

7.2 Carbon modelling 64
Target setting 64

Table 6.1 Option 1 relevant policies 32
Table 6.2 Option 2 relevant policies 32
Table 6.3 Option 3 relevant policies 34
Table 6.4 Option 4 relevant policies 34
Table 6.5 Option 5 relevant policies 35
Table 6.6 Option 6 relevant policies 35
Table 6.7 Option 8 relevant policies 36
Table 6.8 Option modelling assumptions 38

Figure 2.1 Project methodology 10
Figure 4.1 WRWA tonnage of waste collected via kerbside residual, kerbside dry recycling, kerbside garden and peripheral services (including bulk collections). (Recycling rate is plotted on the secondary axis.) 13
Figure 4.2 WRWA annual tonnage of collected dry recycling disaggregated by its composition 14
Figure 4.3 High level disaggregation of WRWA household recycling into food waste, garden waste, dry recyclable material and contamination 14
Figure 4.4 WRWA annual tonnage of collected residual waste disaggregated by its composition 15
Figure 4.5 H&F tonnage of waste collected via kerbside residual, kerbside dry recycling, kerbside garden and peripheral services (including bulk collections). (Recycling rate is plotted on the secondary axis) 16
Figure 4.6 H&F annual tonnage of collected dry recycling disaggregated by its composition 17
Figure 4.7 High level disaggregation of H&F household recycling into food waste, garden waste, dry recyclable material and contamination 17
Figure 4.8 H&F annual tonnage of collected residual waste disaggregated by its composition 18
Figure 4.9 RBKC tonnage of waste collected via kerbside residual, kerbside dry recycling, kerbside garden and peripheral services (including bulk collections). (Recycling rate is plotted on the secondary axis) 19
Figure 4.10 RBKC annual tonnage of collected dry recycling disaggregated by its composition 20
Figure 4.11 High level disaggregation of RBKC household recycling into food waste, garden waste, dry recyclable material and contamination 20
Figure 4.12 RBKC annual tonnage of collected residual waste disaggregated by its composition 21
Figure 4.13 Wandsworth tonnage of waste collected via kerbside residual, kerbside dry recycling, kerbside garden and peripheral services (including bulk collections). (Recycling rate is plotted on the secondary axis) 22
Figure 4.14 Wandsworth annual tonnage of collected dry recycling disaggregated by its composition 23
Figure 4.15 High level disaggregation of Wandsworth household recycling into food waste, garden waste, dry recyclable material and contamination 23

Figure 4.16 Wandsworth annual tonnage of collected residual waste disaggregated by its composition 24
Figure 4.17 Lambeth tonnage of waste collected via kerbside residual, kerbside dry recycling, kerbside garden and peripheral services (including bulk collections). (Recycling rate is plotted on the secondary axis) 25
Figure 4.18 Lambeth annual tonnage of collected dry recycling disaggregated by its composition 26
Figure 4.19 High level disaggregation of Lambeth household recycling into food waste, garden waste, dry recyclable material and contamination 26
Figure 4.20 Lambeth annual tonnage of collected residual waste disaggregated by its composition 27
Figure 6.1 Option 1 - Total collected household recycling composition 41
Figure 6.2 Option 1 - High level net household recycling composition 42
Figure 6.3 Option 1 - Kerbside collected household recycling composition 42
Figure 6.4 Option 1 - High level net kerbside recycling composition 43
Figure 6.5 Option 1 - Total collected household residual waste composition 43
Figure 6.6 Option 1 - Kerbside collected residual waste composition 44
Figure 6.7 Option 2 - Total collected household recycling composition 45
Figure 6.8 Option 2 - High level net household recycling composition 45
Figure 6.9 Option 2 - Kerbside collected household recycling composition 46
Figure 6.10 Option 2 - High level net kerbside recycling composition 46
Figure 6.11 Option 2 - Total collected household residual waste composition 47
Figure 6.12 Option 2 - Kerbside collected residual waste composition 47
Figure 6.13 Option 3 - Total collected household recycling composition 48
Figure 6.14 Option 3 - High level net household recycling composition 48
Figure 6.15 Option 3 - Kerbside collected household recycling composition 49
Figure 6.16 Option 3 - High level net kerbside recycling composition 49
Figure 6.17 Option 3 - Total collected household residual waste composition 50
Figure 6.18 Option 3 - Kerbside collected residual waste composition 50
Figure 6.19 Option 4 - Total collected household recycling composition 51
Figure 6.20 Option 4 - High level net household recycling composition 51
Figure 6.21 Option 4 - Kerbside collected household recycling composition 52
Figure 6.22 Option 4 - High level net kerbside recycling composition 52
Figure 6.23 Option 4 - Total collected household residual waste composition 53
Figure 6.24 Option 4 - Kerbside collected residual waste composition 53
Figure 6.25 Option 5 - Total collected household recycling composition 54
Figure 6.26 Option 5 - High level net household recycling composition 54
Figure 6.27 Option 5 - Kerbside collected household recycling composition 55
Figure 6.28 Option 5 - High level net kerbside recycling composition 55
Figure 6.29 Option 5 - Total collected household residual waste composition 56
Figure 6.30 Option 5 - Kerbside collected residual waste composition 56
Figure 6.31 Option 7 - Total collected household recycling composition 57
Figure 6.32 Option 7 - High level net household recycling composition 57
Figure 6.33 Option 7 - Kerbside collected household recycling composition 58
Figure 6.34 Option 7 - High level net kerbside recycling composition 58
Figure 6.35 Option 7 - Total collected household residual waste composition 59
Figure 6.36 Option 7 - Kerbside collected residual waste composition 59
Figure 6.37 Option 8 - Total collected household recycling composition 60
Figure 6.38 Option 8 - High level net household recycling composition 60
Figure 6.39 Option 8 - Kerbside collected household recycling composition 61
Figure 6.40 Option 8 - High level net kerbside recycling composition 61
Figure 6.41 Option 8 - Total collected household residual waste composition 62
Figure 6.42 Option 8 - Kerbside collected residual waste composition 62

1. Introduction

1.1.1 Wood has been commissioned by Western Riverside Waste Authority (the Authority) to assess the carbon impact of the Authority's and its constituent councils' waste management activities. The output will form part of a new Joint Waste Policy and Strategy for the Authority and its constituent councils (London Boroughs of Hammersmith and Fulham, Lambeth, Wandsworth and the Royal Borough of Kensington and Chelsea (RBKC)), to be developed during 2020/21. The carbon impact of waste management activities within the Authority area, considering past, current and future emissions, will be assessed. The work has taken into consideration the following three factors:

- Historic changes in the tonnage and composition of the Authority's waste over time and how tonnage and composition might change in the future;
- Changes in the way the Authority has managed its waste in the past and how it might do so in the future (e.g. the potential introduction of food and garden waste collections);
- Identification of which waste streams might be best targeted and how (e.g. reduction, reuse, recycling and recovery) to produce the greatest carbon savings taking into account other factors such as financial cost.

1.2 Interim report

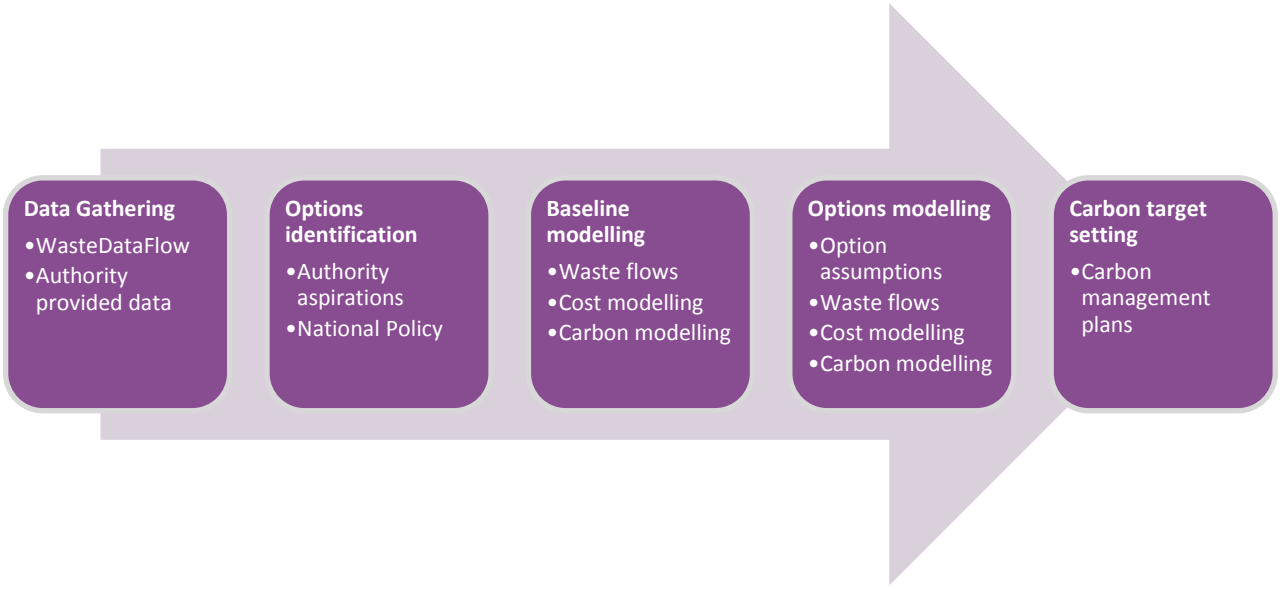
1.2.1 This interim report has been prepared to detail the progress made to date in assessing the carbon impact of the Authority's waste management activities. The baseline waste flows have been calculated and all options to be modelled have been identified and agreed with the Authority. Waste flow modelling has also been completed for all of the identified options, as presented in this interim report. The resource and cost modelling for the options is currently being developed; all clarifications and data were received from the constituent councils on 4th January which will now enable its finalisation.

1.2.2 This report also details the next stages of the project.

2. Methodology

2.1.1 The approach to the project has consisted of a number of steps as identified in Figure 1.1. The sequential development of the project has relied on accurate data gathering to form a robust baseline model, and the options identification and assumptions have been formed through the direction of national policies, with input from both the Authority and Wood to finalise the assumptions in order to inform realistic output for future settings.

Figure 2.1 Project methodology



2.1.2 A number of Key Performance Indicators (KPIs) have also been proposed and agreed with the Authority to ensure that appropriate indicators have been deployed to monitor the impact of future waste management activities.

2.1.3 The steps followed in delivering this project are further discussed in the following sections of this report.

3. Key Performance Indicators

3.1.1 The development of appropriate KPIs will enable the Authority and constituent councils to monitor and measure the effectiveness of any initiatives they implement to reduce carbon emissions, as well as to identify the potential impact on the performance of waste management operations. The KPIs developed are quantitative relating to service improvements.

3.1.2 The model has been designed in a way which allows the Authority to enter data from future waste composition analysis surveys and from this the Authority will be able to easily and readily obtain outputs and monitor progress towards meeting the KPIs. The model is adaptable at the front end, with a bespoke output generator behind the model.

3.1.3 The KPIs were agreed with the Authority, taking into account contractual obligations as well as factors the Authority can influence over the contract period including the age of the collection fleet, fuel efficiency, and MRF reject rate. The following KPIs were agreed as being appropriate for the Authority to monitor:

- Recycling rate
- Waste minimisation
- Cost per tonne of waste recycled
- Greenhouse Gas (GHG) emissions of a particular treatment route
- Vehicle GHG emissions
- Total carbon emissions per capita

4. Historical trends

4.1.1 The Authority provided Wood with waste data dating back to 2002. The following section of the report considers the historical trends over the period 2002 to 2019, highlighting how the Authority's waste arisings and management have changed over the years. Up until 2004, waste data was not recorded with the same granularity as it has been since, so this needs to be taken into consideration when interpretating the trends. Historical trends are provided for the Authority area as a whole, as well as for each of the constituent councils. The historical data focuses on waste collected at the kerbside and at HWRCs and excludes services that are collected outside these sources (e.g. street cleansing, waste from public areas, etc.).

4.2 Historical trends across the Authority area

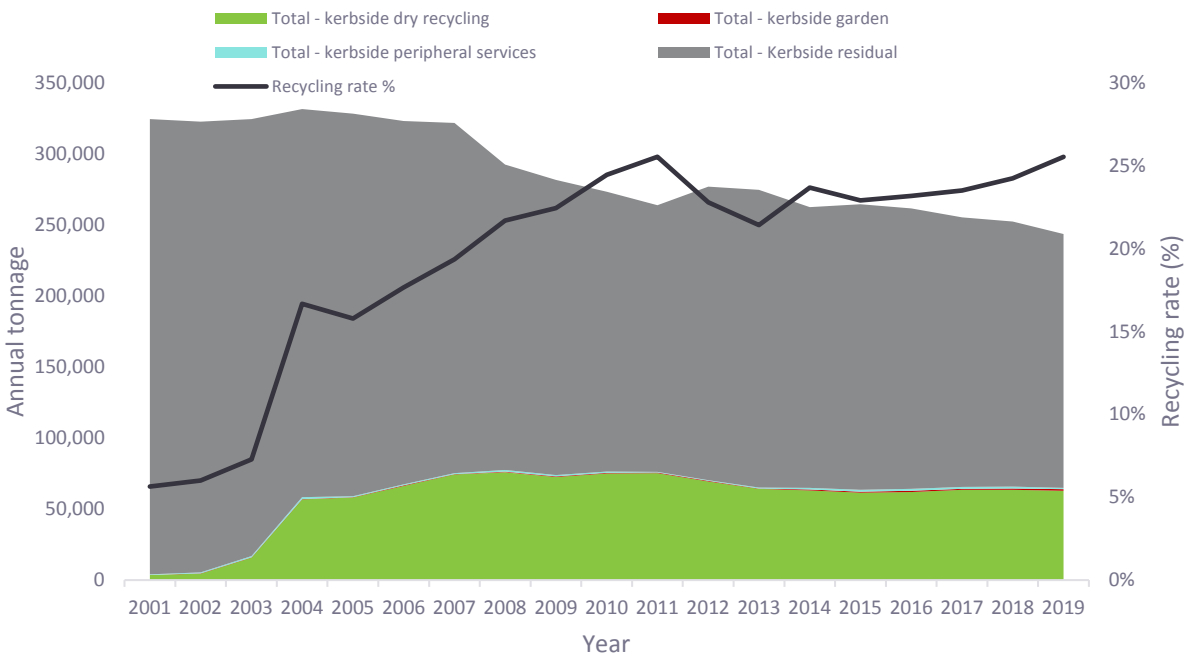
Recycling rate and collected waste tonnages

4.2.1 The overall recycling rate for household collected waste across the Authority increased from 5.6% to 25.5% between 2001 and 2019. The most significant rise was seen between 2002 and 2004, with rates increasing by 11.0% in two years. This trend is seen across each constituent council historical data.

4.2.2 From 2004, recycling rates increased linearly, plateauing at 25.5% in 2011. During this period, kerbside dry recycling tonnages rose by 32% and kerbside residual waste fell by a similar amount.

4.2.3 Recycling rates fell over the following two years to 21.4% in 2013 due to a change in the sampling process. WRWA changed MRFs, from a 3rd party MRF to the MRF at Smugglers Way. The sampling process for the identification of contamination became more stringent and detailed, resulting in increased contamination percentages to improve the quality of the recycling material processed. Since 2013, recycling rates steadily increased to 25.5% in 2019, primarily due to a steady decrease in residual waste arisings as kerbside recycling remained largely stable.

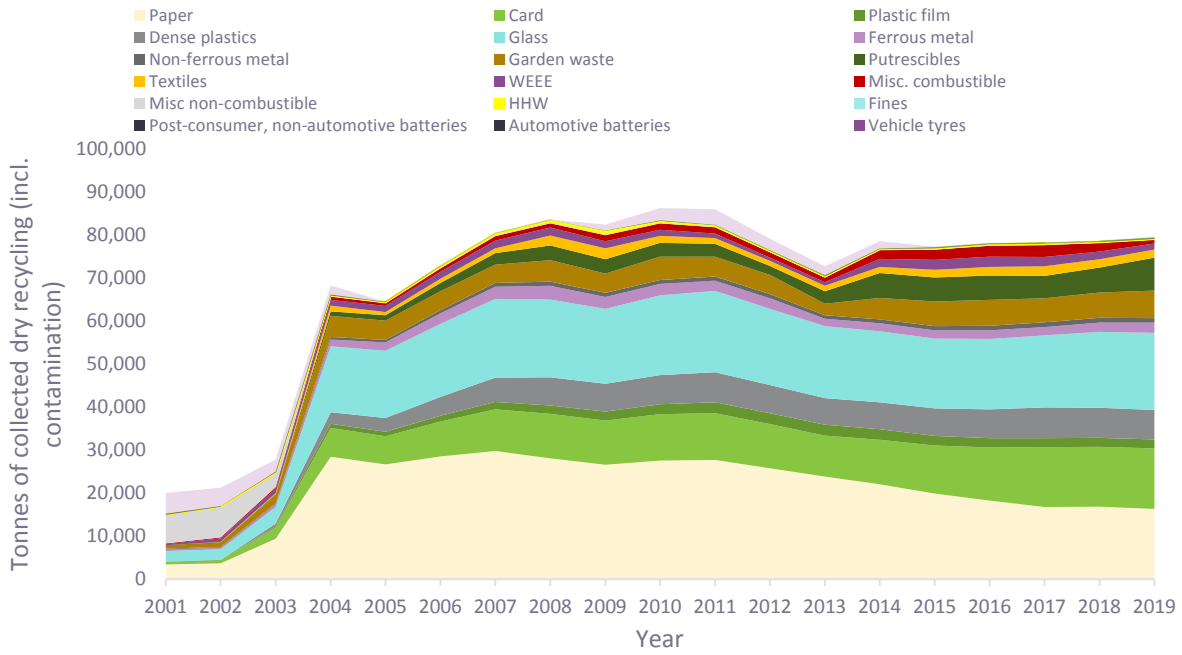
Figure 4.1 WRWA tonnage of waste collected via kerbside residual, kerbside dry recycling, kerbside garden and peripheral services (including bulk collections). (Recycling rate is plotted on the secondary axis.)



Recycling material tonnages

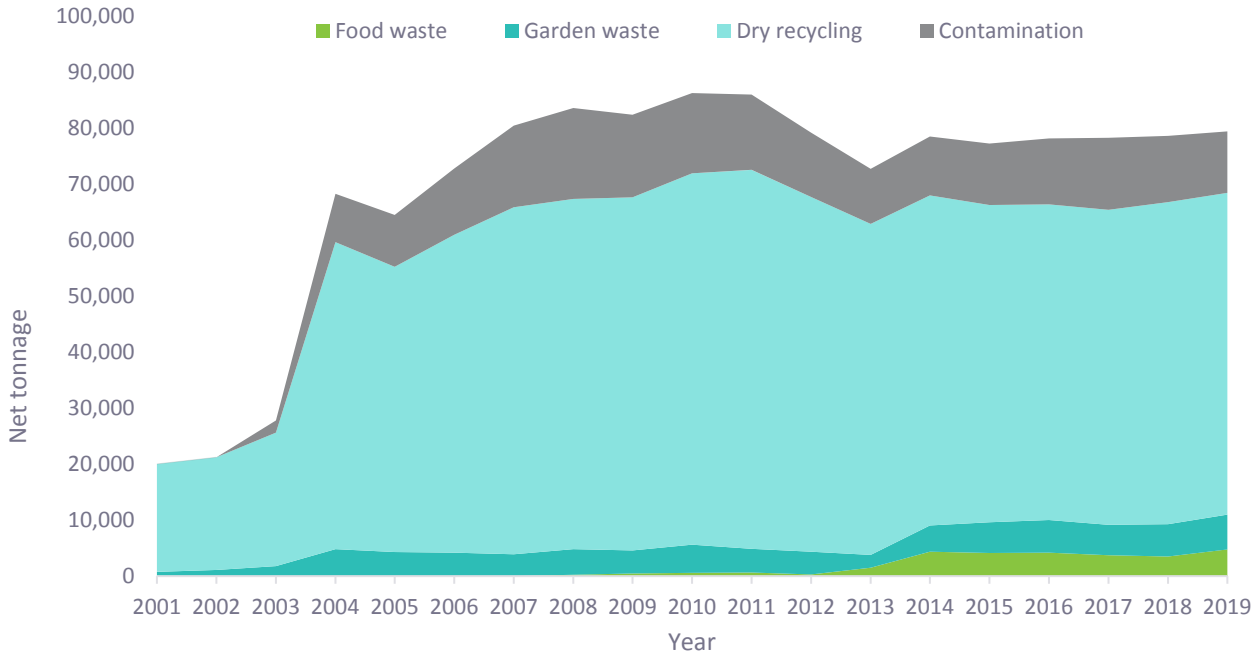
4.2.4 After a rapid increase in kerbside recycling tonnage in the 2000s, recycling tonnages from all sources (i.e. kerbside and HWRCs/CAs) had plateaued by 2010. The tonnages of most recyclable materials increased since 2004, with the exception of paper which fell by 42% which may be due to the ongoing transition away from paper to digital media. Paper, glass and card remained the most collected materials, by tonnage, over the 19-year period with glass overtaking paper in 2018. Light-weighting of material over the last decade will also have affected tonnages reported. The recycling tonnages presented below include contamination and therefore represent the lump recycling tonnages as collected at the source.

Figure 4.2 WRWA annual tonnage of collected dry recycling disaggregated by its composition



4.2.5 Figure 4.3 disaggregates the net household recycling into four major categories; food waste, garden waste, dry recyclable material and contamination – material that cannot be recycled. This illustrates the level of contamination collected within the dry recycling stream. Dry recycling includes all recyclable materials including textiles and WEEE but excludes food and garden waste.

Figure 4.3 High level disaggregation of WRWA household recycling into food waste, garden waste, dry recyclable material and contamination

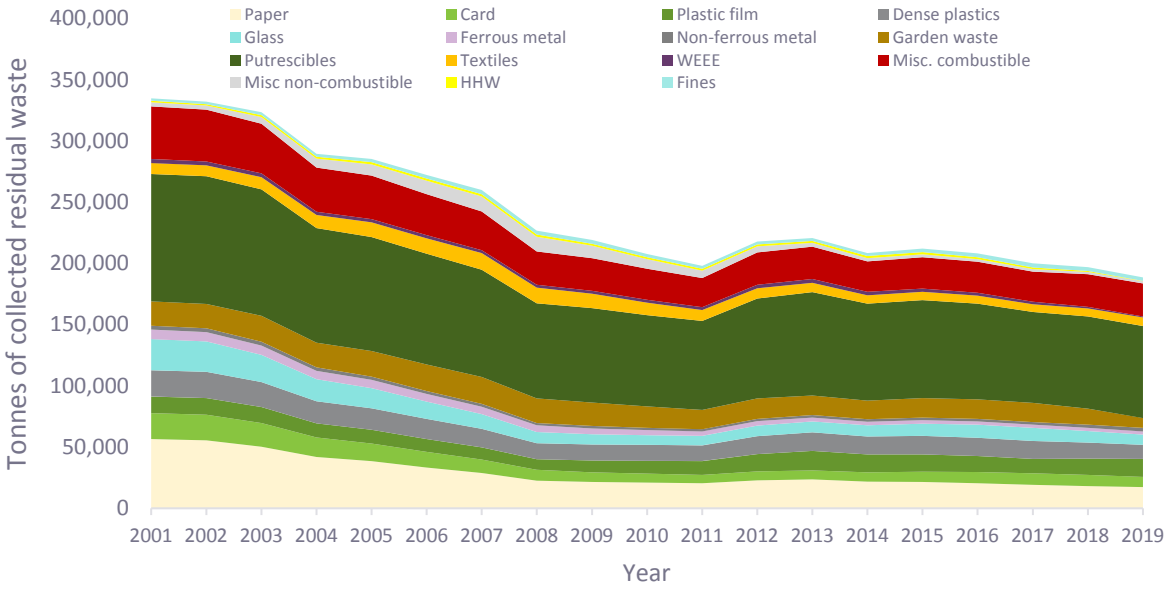


Residual material tonnages

4.2.6 Residual waste tonnages from all sources steadily fell by 44% between 2001 and 2019. Most of this decrease was between 2001 and 2011 where residual waste tonnages decreased by 41%. From 2011 to 2019, residual waste gradually reduced by a further 2%.

4.2.7 The composition of the total residual collected waste stream remained, with a few exceptions, relatively stable despite growth across most streams within the dry recycling stream. Glass and card saw significant reductions as more of these material streams were recycled whereas a reduction in paper was likely due to lower consumption. Garden waste saw a significant decrease in recent years despite only a modest increase within the recycling stream. This may be partly due to more households composting their garden waste at home and to potential changes in the weather/ climate.

Figure 4.4 WRWA annual tonnage of collected residual waste disaggregated by its composition



4.3 Hammersmith & Fulham

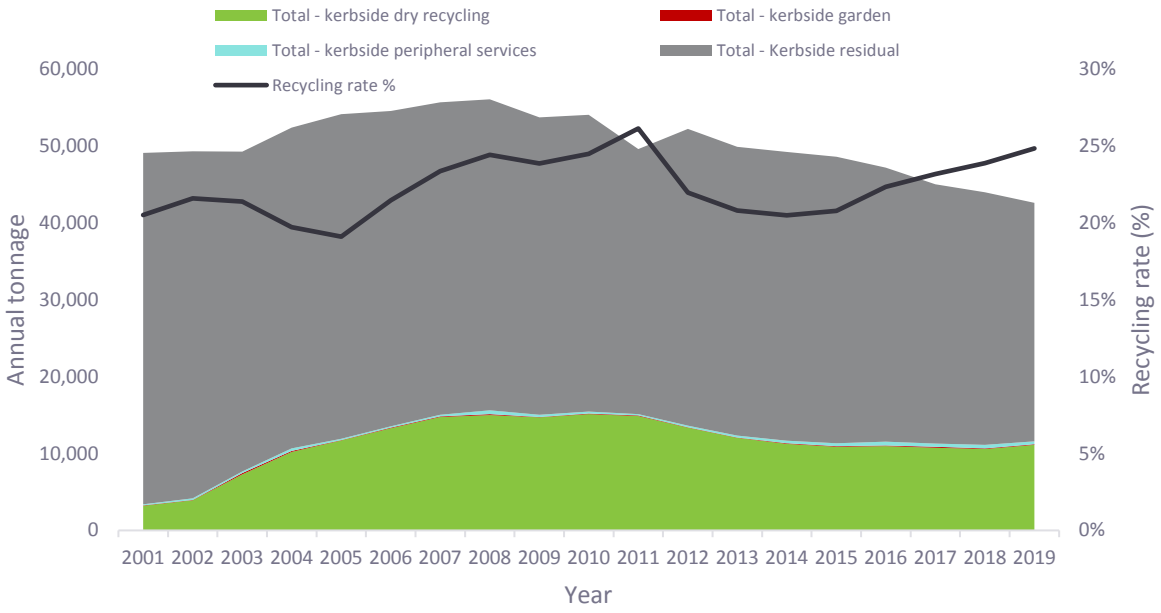
Recycling rate and collected waste tonnages

4.3.1 Since 2001, the overall recycling rate for household collected waste increased from 20.5% to 24.9% in 2019. From 2005, the recycling rate increased and plateaued at 24.4% in 2008. Similarly, collected kerbside dry recycling peaked in 2008 at around 15,000 tonnes per annum, whilst kerbside residual waste arisings fell steadily, taking the total household collected waste to a peak of c. 59,500 tonnes in 2008.

4.3.2 The borough's recycling rate increased from 23.9% in 2009 to a peak of 26.2% in 2011, the highest rate to date, after which the recycling rate declined to 22.0% in 2012. This peak in 2011 coincided with a marked drop in collected residual tonnage whilst kerbside dry recycling remained relatively constant. The fall in recycling rate in 2012 coincided with an increase in collected residual waste and a slight decrease in dry recycling.

4.3.3 Between 2012 and 2015, the borough's recycling rate remained consistently below 21.0%, mirroring the total kerbside dry recycling collection which remained stable between 10,700 and 11,300 tonnes. From 2015, the quantity of kerbside dry recycling increased and, as a result, the recycling rate steadily increased almost linearly from 20.8% to 24.9% in 2019. Meanwhile, the total kerbside collection steadily fell by nearly 20% from 38,600 tonnes in 2012 to 31,000 in 2011 which would suggest that, in recent years, the increase in recycling rate was due to reduced waste generation rather than increased recycling.

Figure 4.5 H&F tonnage of waste collected via kerbside residual, kerbside dry recycling, kerbside garden and peripheral services (including bulk collections). (Recycling rate is plotted on the secondary axis)

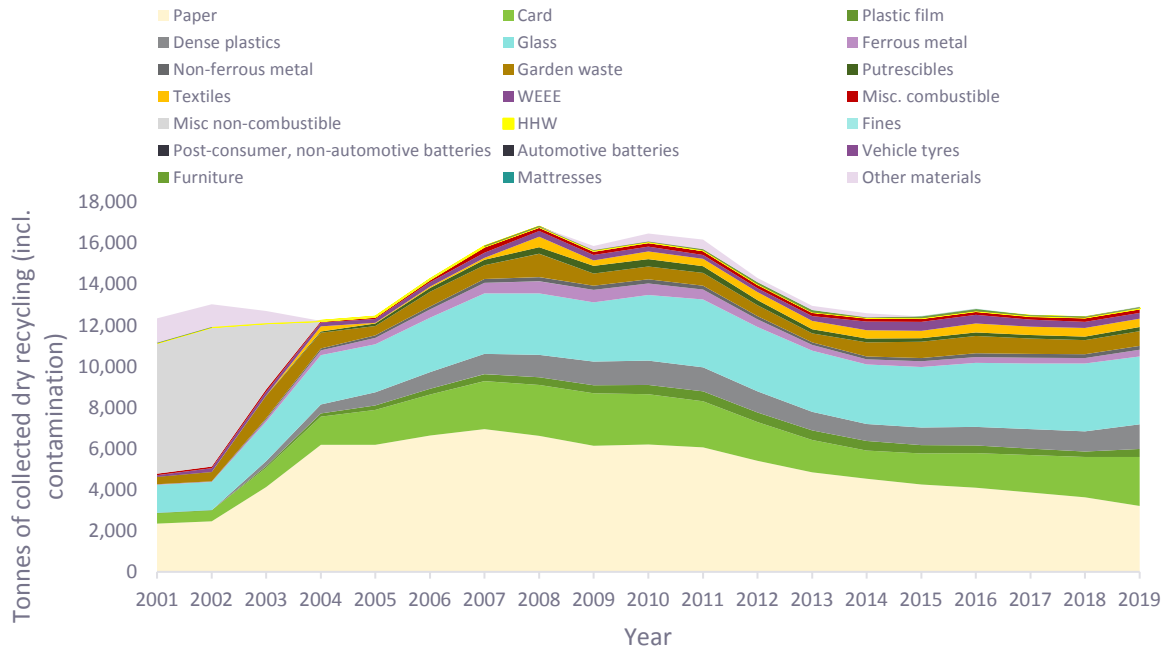


Recycling material tonnages

4.3.4 Up until 2004, waste data was not recorded with the same granularity as it has been since. In 2004 it is seen that paper made up 50.6% of the dry recycling stream followed by glass (19.6%) and card, (11.2%). Paper, card and glass remained the top three ranking materials in that order until glass tonnage exceeded paper in 2019.

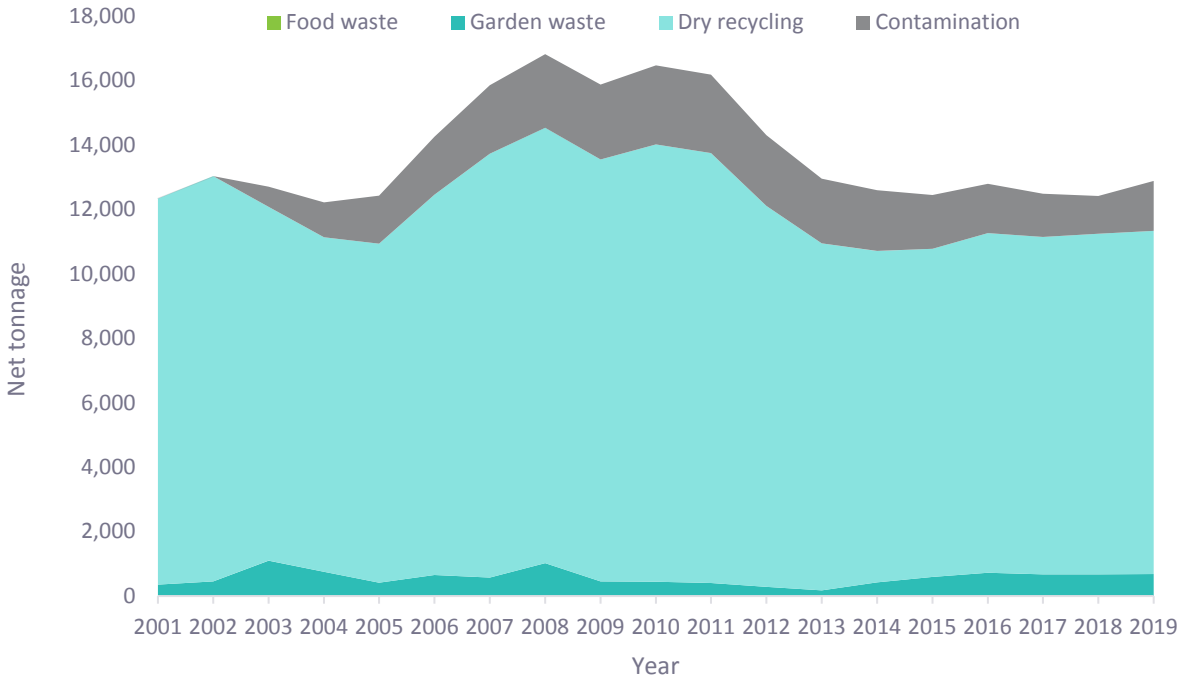
4.3.5 As noted above, the total collected recycling increased between 2004 and 2008 with most material tonnages increasing year on year. Exceptions include garden waste, which experienced a drop in 2007 followed by a large peak in 2008, and paper, which reached a maximum of 6,950 tonnes in 2007 before steadily falling year on year. As a result of collected paper tonnages decreasing, all other material streams experienced a gain in the proportion of the dry recycling stream with the exception of glass, which fell from 18.9% to 17.7%. Textiles have experienced the greatest growth in this 2004-2008 period, increasing its percentage share tenfold. As in the case of the recycling tonnages presented for the whole Authority area, the recycling tonnages presented below are inclusive of some levels of contamination.

Figure 4.6 H&F annual tonnage of collected dry recycling disaggregated by its composition



4.3.6 Figure 4.7 disaggregates the net household recycling into four major categories; food waste, garden waste, dry recyclable material and contamination – material that cannot be recycled. This illustrates the level of contamination collected within the dry recycling stream. Dry recycling includes all recyclable materials including textiles and WEEE but excludes food and garden waste.

Figure 4.7 High level disaggregation of H&F household recycling into food waste, garden waste, dry recyclable material and contamination

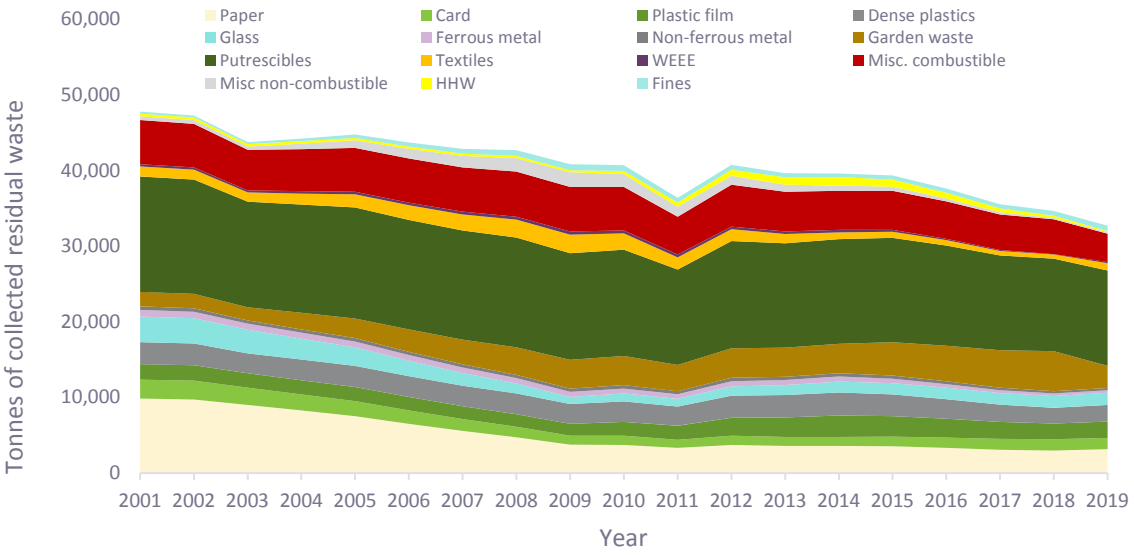


Residual material tonnages

4.3.7 Residual waste tonnages steadily fell by over 30% between 2001 and 2019. Most materials maintained a similar proportion within the waste stream. The exceptions, garden waste and plastic film, increased by 66.7% and 14.3% respectively during this period, despite garden waste tonnages falling since 2018.

4.3.8 Paper saw the greatest reduction, as discussed previously, followed by glass and miscellaneous combustibles; falling by 65%, 48% and 30% respectively. Miscellaneous combustibles, HHW and ferrous metals also saw significant reductions of over 50%, however it is noted that these are minor streams and large annual variations in certain categories (e.g. miscellaneous combustibles) may be partly due to inconsistencies in recording/ reporting of these waste streams.

Figure 4.8 H&F annual tonnage of collected residual waste disaggregated by its composition



4.4 Royal Borough of Kensington & Chelsea

Recycling rate and collected waste tonnages

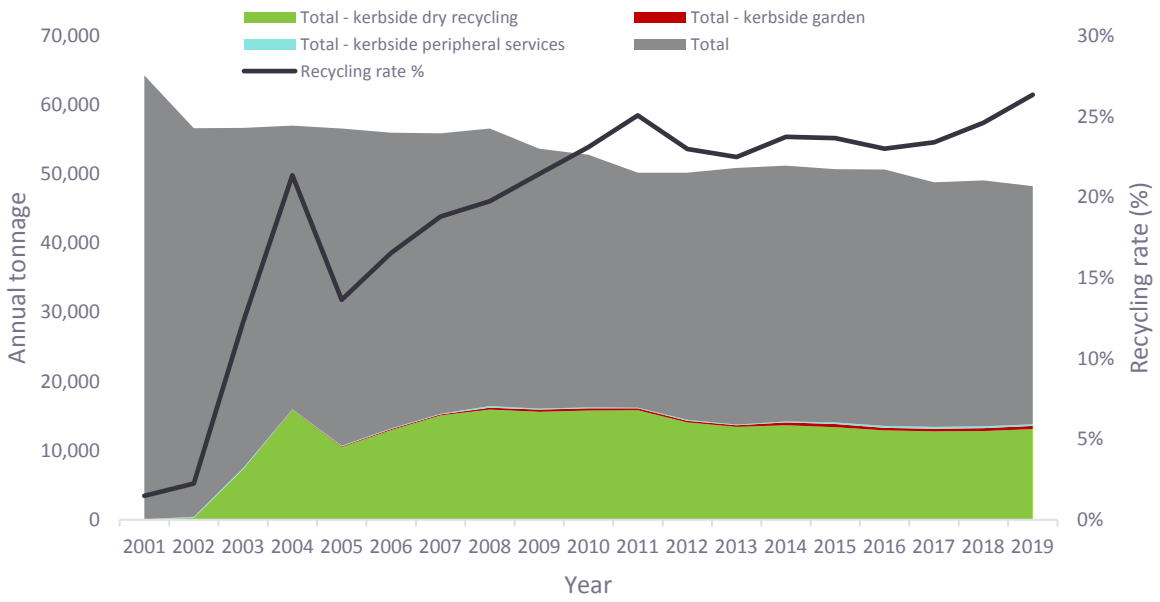
4.4.1 Since 2001, the overall recycling rate for household collected waste has increased significantly from 1.5% to 26.4% in 2019. The recycling rate increased fourteen-fold between 2001 and 2004 to 21.4%. This was followed by a sharp fall in 2005 to 13.6%. This trend was mirrored by the quantity of collected kerbside dry recycling during this period, which reached a peak of c.16,000 tonnes in 2004 before dropping in 2005.

4.4.2 From 2005, the quantity of collected kerbside dry recycling increased, plateauing at around 16,500 tonnes between 2008 and 2011. During this period, the recycling rate increased steadily to a peak of 25.1% in 2011, mainly due to a steady fall in collected residual waste by 17% over the period.

4.4.3 Despite a slight fall in 2012 and 2013 of less than 3%, the quantity of collected kerbside dry recycling remained relatively stable, returning to 2011 levels by 2019. Meanwhile the quantity of kerbside residual waste remained stable. Despite the relatively small fluctuations in collected kerbside residual and dry recycling, the recycling rate was more significantly affected, falling from a

peak of 25.1% in 2011 to 22.5% in 2013. Since then, the recycling rate has increased steadily to 26.4% in 2019.

Figure 4.9 RBKC tonnage of waste collected via kerbside residual, kerbside dry recycling, kerbside garden and peripheral services (including bulk collections). (Recycling rate is plotted on the secondary axis)



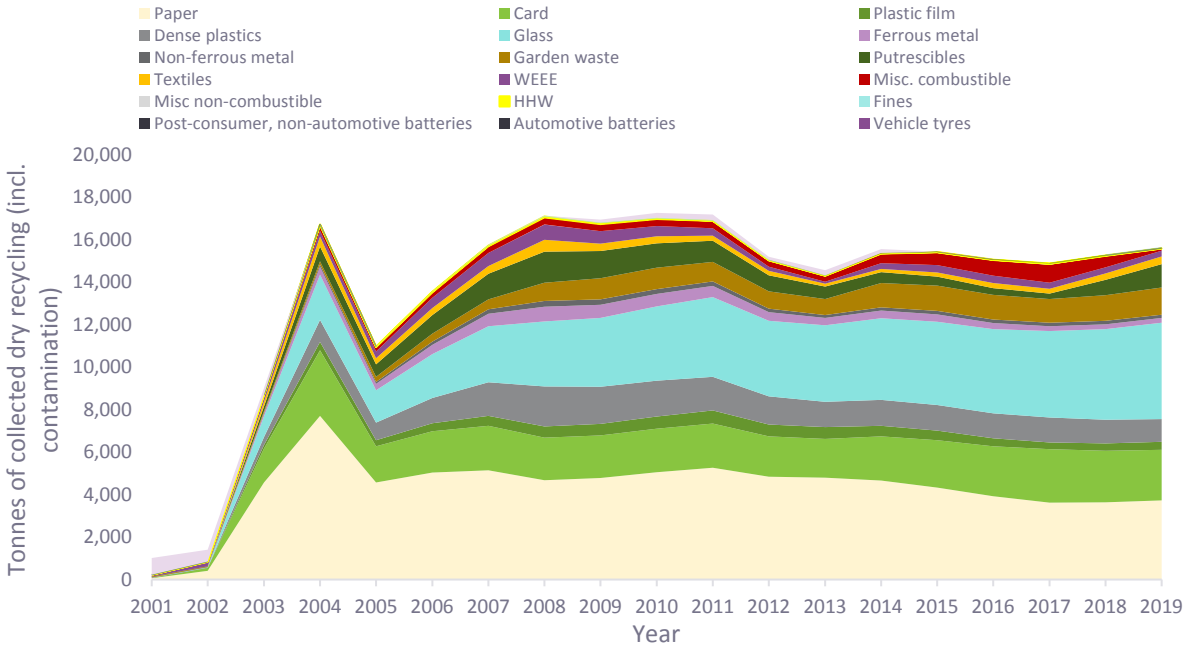
Recycling material tonnages

4.4.4 In 2004, 7,720 tonnes of paper were collected, making up 46.1% of the waste stream followed by card (18.4%) and glass (12.7%). Paper, card and glass remained the top three ranking materials throughout the entire period.

4.4.5 Paper tonnages fell by over 50% between 2004 and 2019, likely due to the transition to digital media. Glass almost doubled in the same period whilst card remained relatively stable. Glass overtook card as the second most collected material in 2007 and overtook paper in 2016 to become the most collected material.

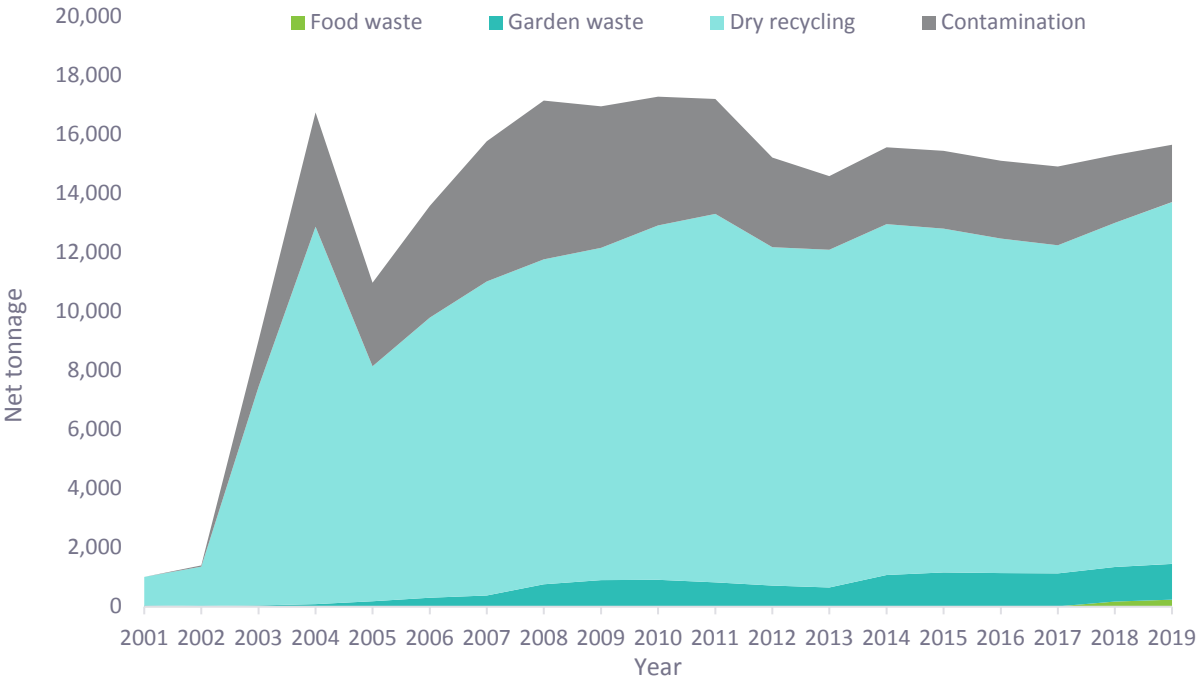
4.4.6 Collected garden waste has increased steadily, and nearly seven-fold since 2004. Putrescibles made up a significant proportion of the composition between 2005 and 2011 before falling between 2011 and 2017. Before 2018, when the council introduced separate kerbside food waste collections, food waste tonnages reported in the recycling were contamination. Therefore, before 2011, food waste was a considerable source of contamination in the recycling, which was steadily tackled after 2011. In recent years the proportion of food waste in the composition of total recycling collected has increased, but this is because a separate kerbside food waste collection was introduced by the council in two round areas, and not because of increased food waste contamination of the dry recycling streams.

Figure 4.10 RBKC annual tonnage of collected dry recycling disaggregated by its composition



4.4.7 Figure 4.11 disaggregates the net household recycling into four major categories; food waste, garden waste, dry recyclable material and contamination – material that cannot be recycled. This illustrates the level of contamination collected within the dry recycling stream. Dry recycling includes all recyclable materials including textiles and WEEE but excludes food and garden waste.

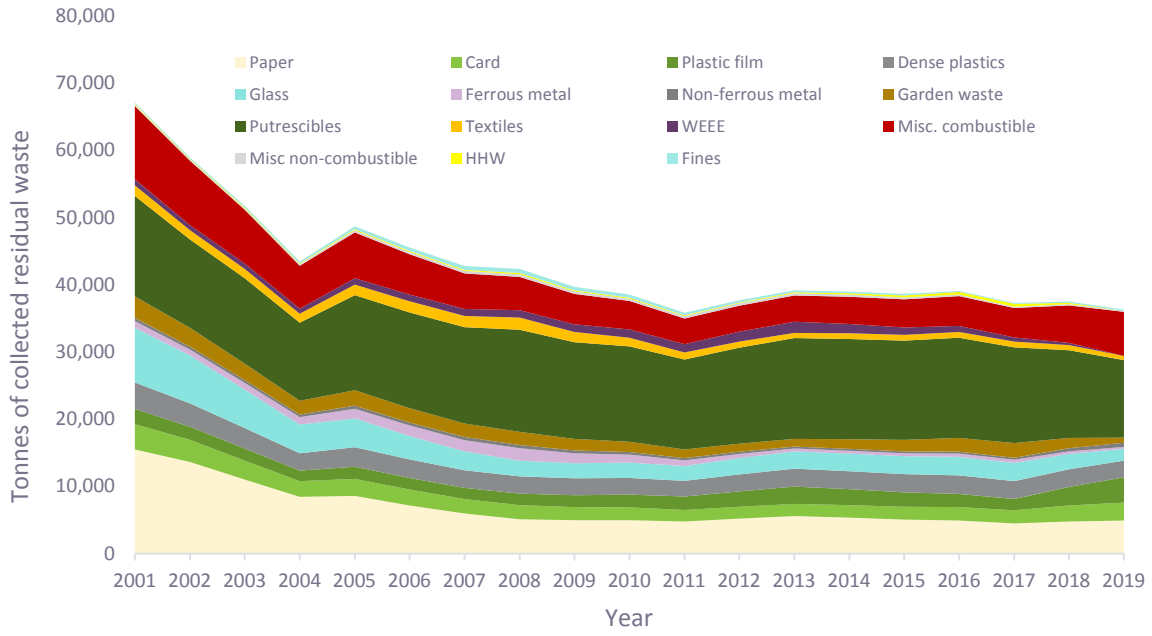
Figure 4.11 High level disaggregation of RBKC household recycling into food waste, garden waste, dry recyclable material and contamination



Residual material tonnages

4.4.8 Residual waste collection tonnage steadily fell by almost half between 2001 and 2019. The most significant fall being between 2001 and 2004, followed by an increase in 2005 which aligned with the drop in recycling rate as discussed above. All material streams have maintained a similar proportion, with most materials reducing in tonnage year on year. Most notable are paper, as discussed previously, and putrescibles which have made up a smaller proportion in recent years. Conversely, miscellaneous combustibles and plastic film have both increased in recent years.

Figure 4.12 RBKC annual tonnage of collected residual waste disaggregated by its composition

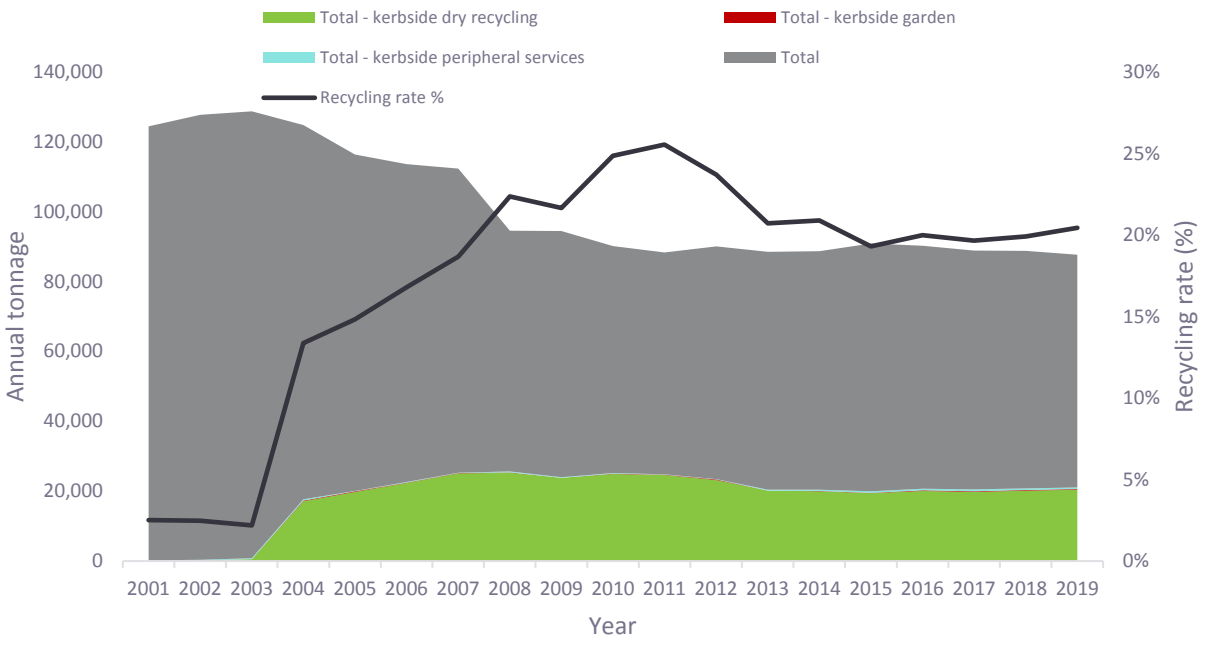


4.5 Wandsworth

Recycling rate and collected waste tonnages

4.5.1 The overall recycling rate for household collected waste increased from 2.2% to 20.4% between 2001 and 2019, with a marked increase from 2.2% in 2003 to 13.4% in 2004. A steady increase in recycling rate was maintained until 2008, corresponding to a steady decrease in kerbside residual waste tonnages and an increase in kerbside dry recycling tonnages during this period. The quantity of collected kerbside dry recycling plateaued from 2008 whilst residual waste also remained stable. This resulted in the recycling rate peaking at 25.6% in 2011 and decreasing to 19.3% in 2015. Since 2015, the recycling rate gradually increased to 20.4% in 2019.

Figure 4.13 Wandsworth tonnage of waste collected via kerbside residual, kerbside dry recycling, kerbside garden and peripheral services (including bulk collections). (Recycling rate is plotted on the secondary axis)



Recycling material tonnages

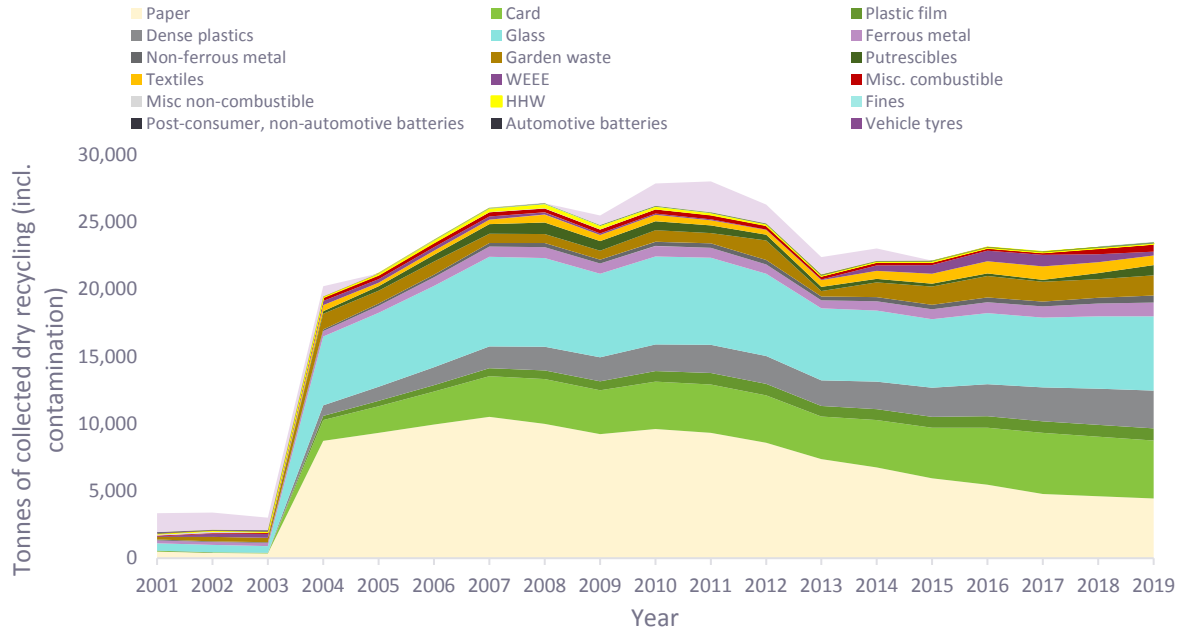
4.5.2 By 2004, paper collection reached 8,730 tonnes, making up 43.1% of the dry recycling stream followed by glass (25.3%) and card (7.7%). Paper, glass and card remained the top three ranking materials until 2019.

4.5.3 Paper tonnages continued to increase gradually to 10,500 tonnes in 2007 before falling by 52% between 2004 and 2019, likely due to the transition to digital media. Glass tonnages decreased by 20% in comparison and overtook paper in 2017 to become the most collected material. Card increased by over 40% and remained the third most collected material throughout.

4.5.4 Dense plastics tonnages experienced steady growth over the same period, increasing by over 70%. Garden waste, textiles and miscellaneous non-combustibles also more than doubled in the same period.

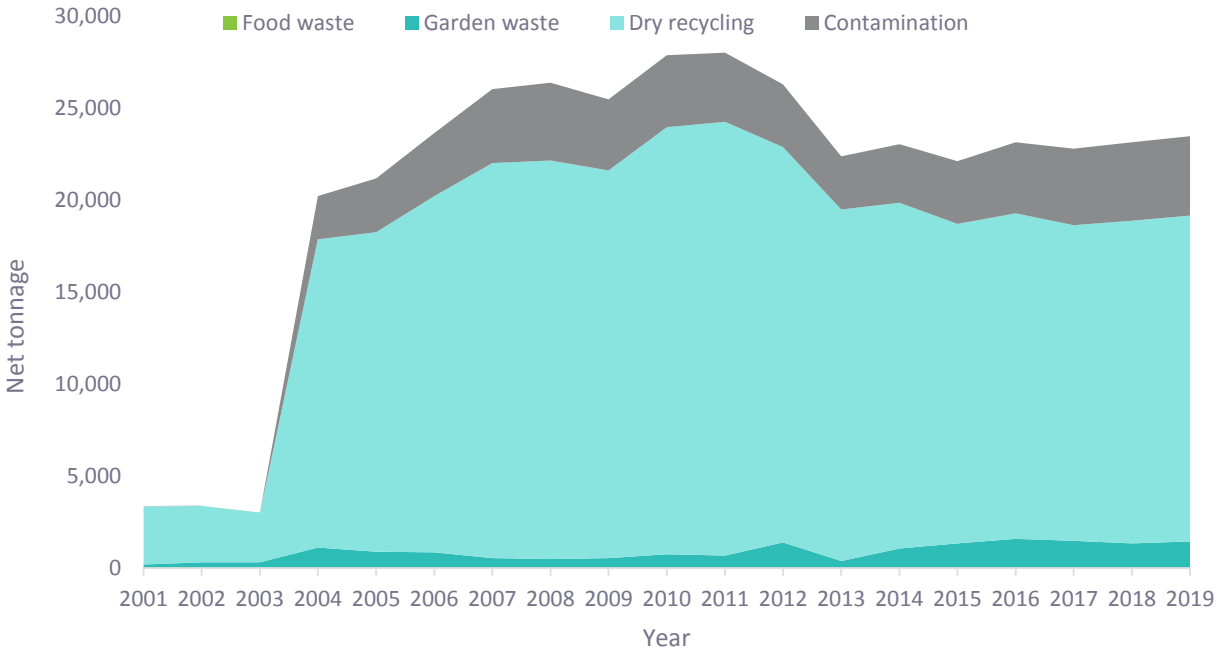
4.5.5 Garden waste tonnages have steadily increased by seven-fold since 2004. Putrescibles made up a significant proportion of the composition between 2005 and 2011 before falling between 2011 and 2017. In recent years it increased, replacing the share held by miscellaneous combustibles. 'Other materials' experienced a rise and fall between 2008 and 2015, which may be as a result of material reclassification.

Figure 4.14 Wandsworth annual tonnage of collected dry recycling disaggregated by its composition



4.5.6 Figure 4.15 disaggregates the net household recycling into four major categories; food waste, garden waste, dry recyclable material and contamination – material that cannot be recycled. This illustrates the level of contamination collected within the dry recycling stream. Dry recycling includes all recyclable materials including textiles and WEEE but excludes food and garden waste.

Figure 4.15 High level disaggregation of Wandsworth household recycling into food waste, garden waste, dry recyclable material and contamination

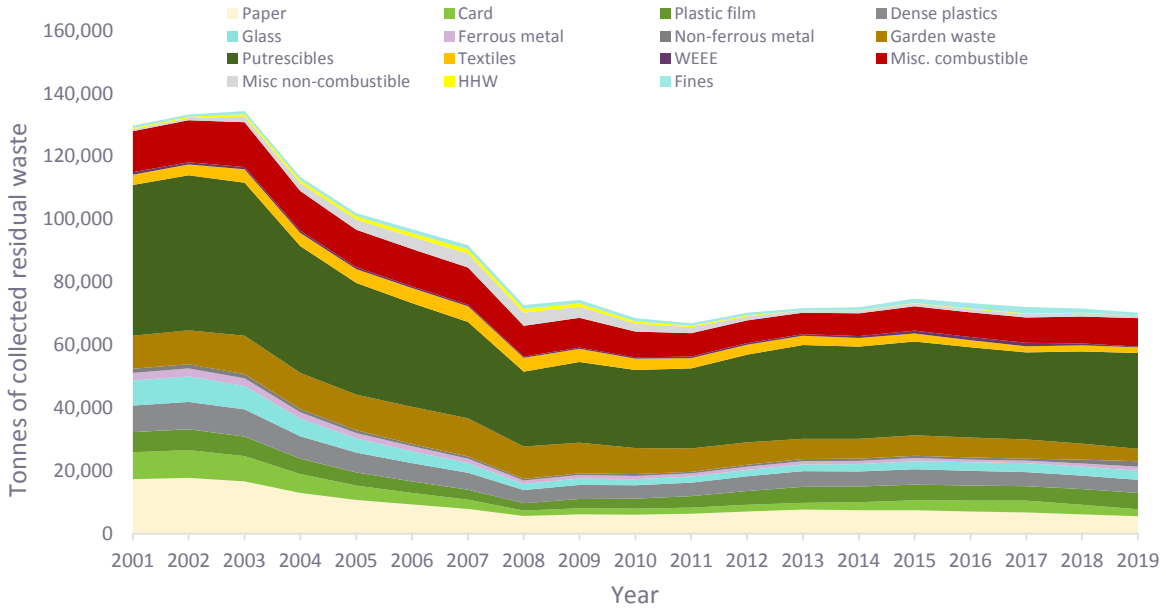


Residual material tonnages

4.5.7 Residual waste collection tonnages steadily fell by almost half between 2001 and 2019. Most of this decrease was between 2003 and 2008 where residual waste collection tonnage reduced by 36%. Since 2008, total residual tonnages remained relatively stable.

4.5.8 Paper, card, glass and dense plastics in the residual waste stream saw the greatest decline between 2003 and 2004. Putrescibles also saw a marked decrease of nearly 20% though it does not appear that it was transferred to the recycling tonnages during this period. From 2004 onwards, most materials maintained a similar proportion within the waste stream with most materials falling between 40 and 70% between 2003 and 2019.

Figure 4.16 Wandsworth annual tonnage of collected residual waste disaggregated by its composition



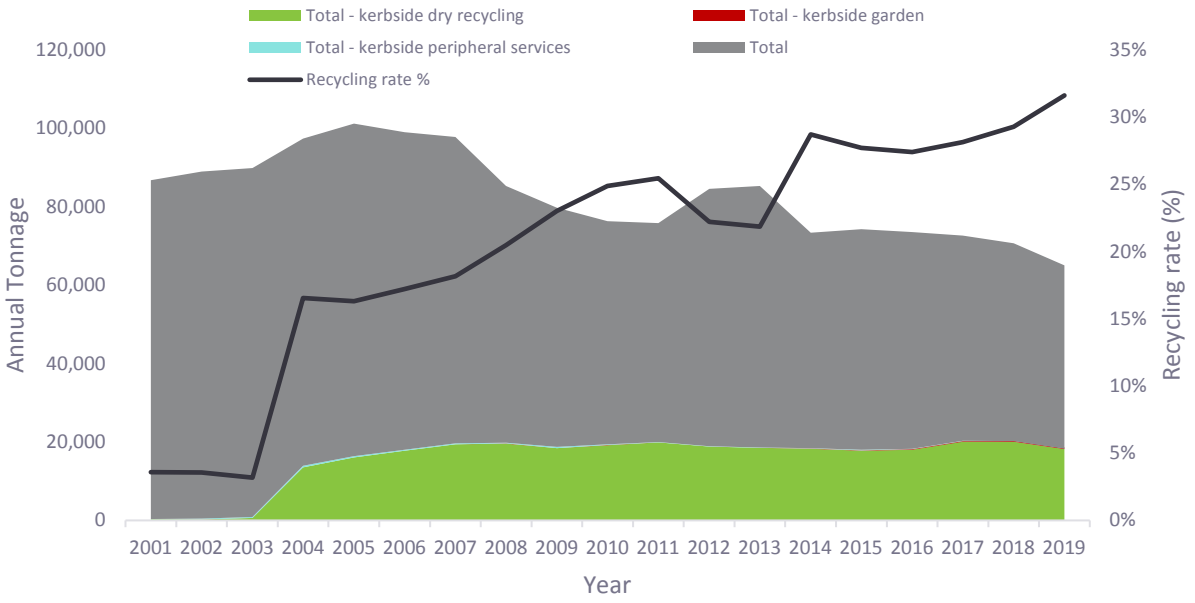
4.6 Lambeth

Recycling rate and collected waste tonnages

4.6.1 The overall recycling rate for household collected waste increased from 3.6% to 31.6% between 2001 and 2019. The most significant increase is seen from 2.2% in 2003 to 13.4% in 2004. A steady increase in recycling rate was maintained until 2011, corresponding to a steady decrease in kerbside residual waste collected and a marginal increase in kerbside dry recycling during this period. The quantity of collected kerbside dry recycling plateaued from 2007 whilst residual waste continued to fall. Subsequently, the recycling rate plateaued at 25.5% in 2011 before decreasing to 21.9% in 2013. This was largely influenced by an increase in residual tonnage whilst the quantity of collected kerbside dry recycling remained stable.

4.6.2 Since 2013, the recycling rate grew to 31.6% by 2019, driven by a decrease in residual waste whilst recycling tonnages remained stable, with a slight decrease from 2018.

Figure 4.17 Lambeth tonnage of waste collected via kerbside residual, kerbside dry recycling, kerbside garden and peripheral services (including bulk collections). (Recycling rate is plotted on the secondary axis)



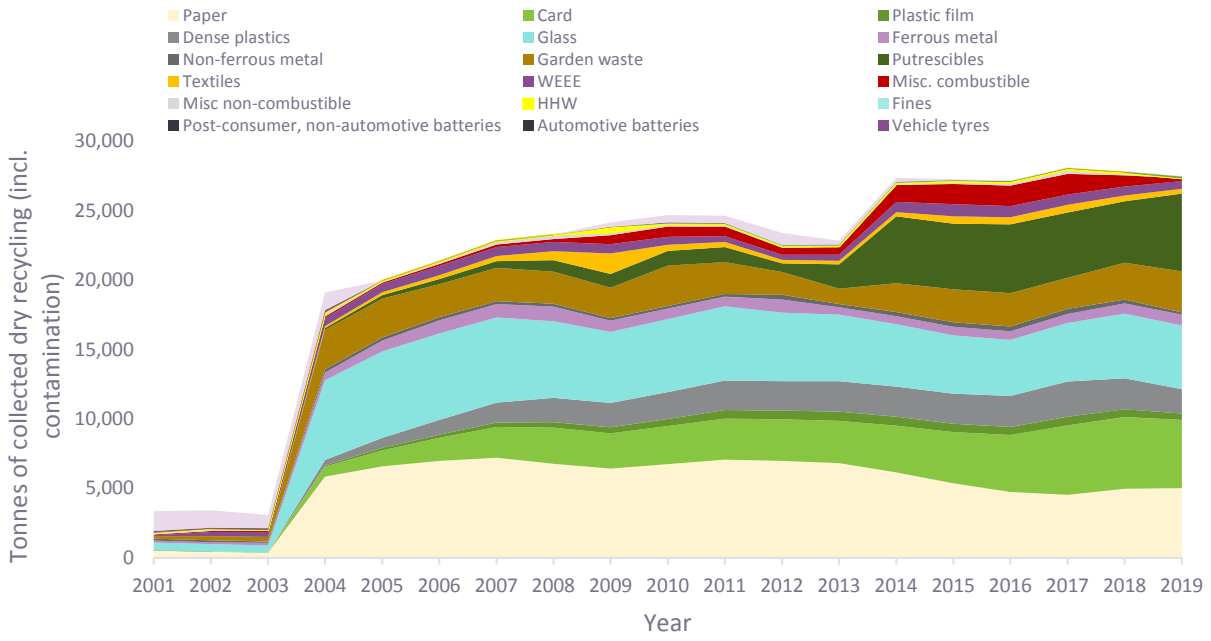
Recycling material tonnages

4.6.3 By 2004, paper collection reached 5,850 tonnes, making up 30.6% followed by glass (30.0%) and garden waste (14.9%). Paper tonnages increased slightly to 7,200 tonnes in 2007 before falling by 14% between 2004 and 2019, likely due to the transition to digital media. Glass tonnages decreased by 20% in the same period whereas garden waste has remained largely the same despite experiencing a dip between 2012 and 2014.

4.6.4 Card steadily grew nearly six-fold in the same period, becoming the third most collected material in 2019. Dense plastics also increased more than five-fold until 2017 but decreased from 2018. Putrescibles made the strongest gains, increasing by more than 40 times the quantity collected in 2004 to become the most collected recyclable material in 2019. This was driven by the separate kerbside food waste collections that the council introduced in 2013/2014, Food waste tonnages shown in the recycling tonnages collected could be considered contamination included in the dry recycling stream.

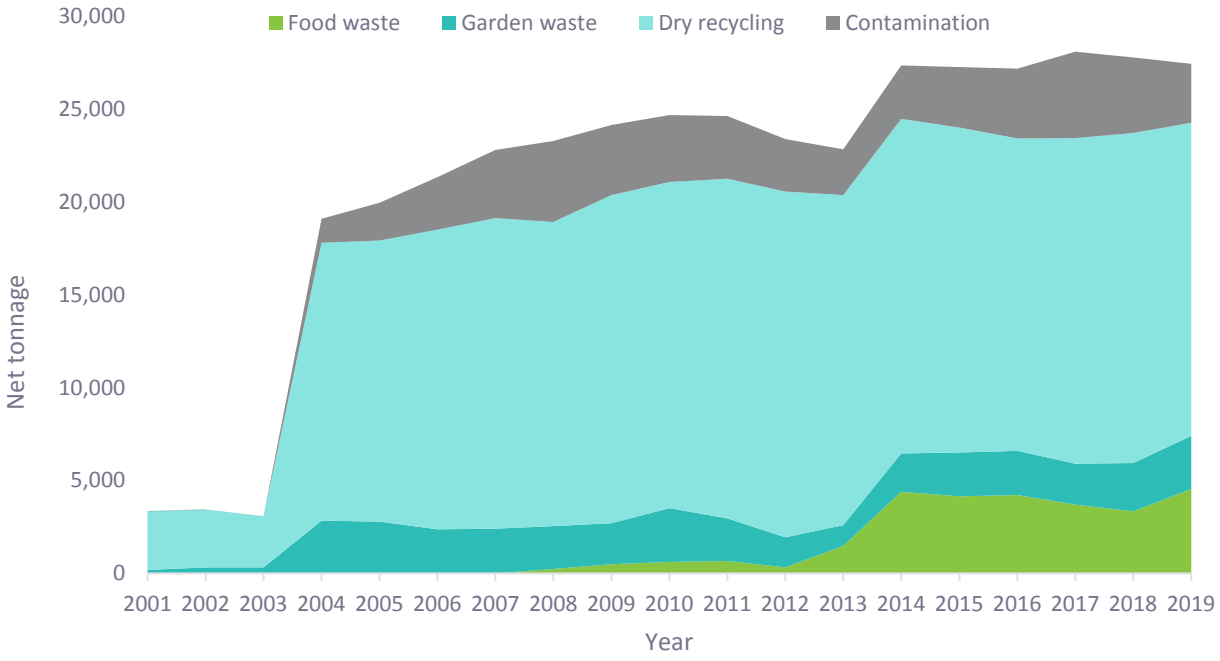
4.6.5 Please find attached the interim report outlining progress to date. Please note that we have not included any carbon modelling outputs at this stage, as without the resource assessment being completed, the carbon results would not add much value, and may potentially be misleading. Now we have all the remaining data from the boroughs we are progressing that this week.

Figure 4.18 Lambeth annual tonnage of collected dry recycling disaggregated by its composition



4.6.6 Figure 4.19 disaggregates the net household recycling into four major categories; food waste, garden waste, dry recyclable material and contamination – material that cannot be recycled. This illustrates the level of contamination collected within the dry recycling stream. Dry recycling includes all recyclable materials including textiles and WEEE but excludes food and garden waste.

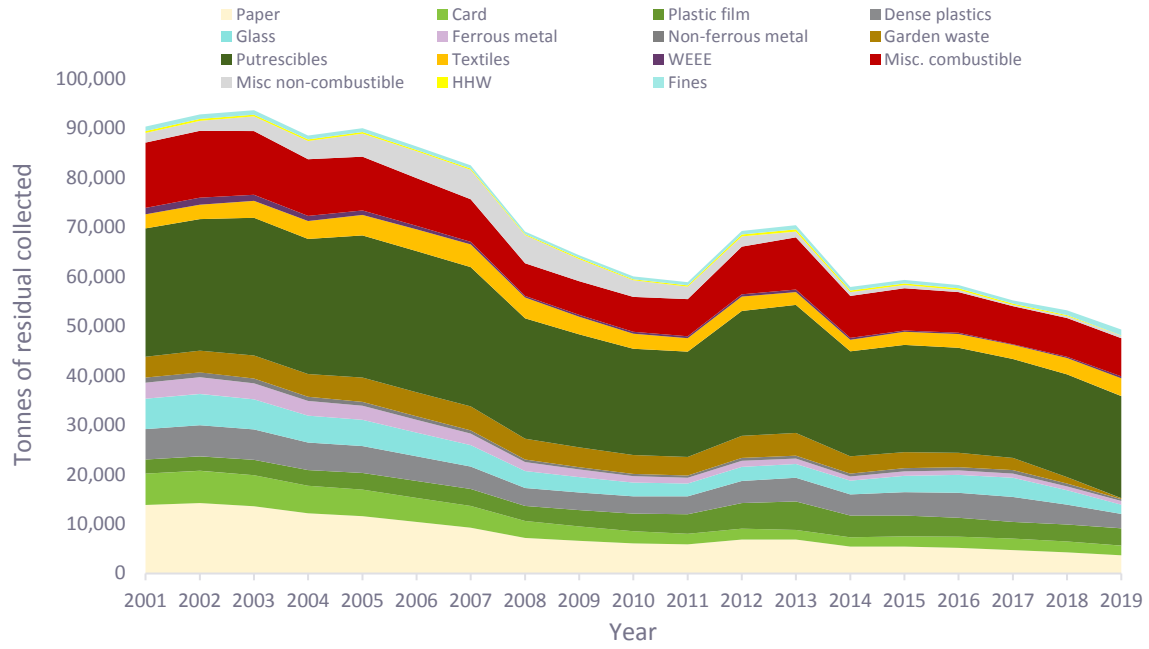
Figure 4.19 High level disaggregation of Lambeth household recycling into food waste, garden waste, dry recyclable material and contamination



Residual material tonnages

4.6.7 Residual waste collection tonnages reduced steadily by almost half between 2001 and 2019. Most of this decrease was between 2003 and 2011 where residual waste collection tonnage decreased by 37%. Throughout 2001 to 2019, the composition of the total residual collected waste stream remained relatively stable despite significant variation within the dry recycling stream. Most material tonnages decreased by varying levels of between 25% and 95%, except for plastic film and textiles which grew by 12% and 5% respectively. Garden waste in the residual waste stream has decreased significantly in recent years, almost halving since 2017.

Figure 4.20 Lambeth annual tonnage of collected residual waste disaggregated by its composition



5. Baseline modelling

5.1.1 A baseline model has been developed to support the assessment of KPIs on the three core areas of:

- Waste Flows;
- Service Costs; and
- Carbon Impact.

5.1.2 Wood and the Authority verified and validated the model against the historic position to ensure that the model accurately represents the services of the Authority and its constituent councils. The model has been developed to provide data at constituent council level, as well as providing a consolidated Authority wide view.

5.1.3 It was agreed with the Authority that all municipal waste collection services were to be included in the waste flow modelling apart from street cleansing and markets waste. The assessment has primarily focused on the waste treatment/disposal delivery of the service, although high level estimates of kerbside resources and costs required to deliver the baseline (and thereafter the options) have also been calculated.

5.2 Waste Flow Modelling

5.2.1 Using the data provided by the Authority (and pre-agreed, evidence-based assumptions) a detailed baseline model has been developed (in Microsoft Excel), which includes historical (from 2002 onwards), current and future compositional data and waste flows for recycling, residual waste and total waste collected, detailed by material type. The duration of the waste flow model is up to 2035. Capture and contamination rates for materials targeted for dry recycling have also been estimated over this time period. The model includes information on number of households and quantities of waste generated per household.

5.2.2 Future waste growth has been incorporated into the models based on housing growth rates, and the composition, contamination, yield and capture rate data of the last full financial year.

5.2.3 The waste treatment/ disposal routes and quantities and types of waste managed via each route have also been identified. This will allow the estimation of historical and current carbon emissions for the Authority. Due to lack of data, it was not possible to estimate the dependence of the Authority to landfill, although it has been indicated that landfilling has been largely replaced by incineration with energy recovery.

5.3 Cost Modelling

5.3.1 The output of the waste flow modelling, along with a range of operational and cost assumptions relating to the kerbside collection services operated by the constituent councils, will be used to populate a bespoke cost model (in Microsoft Excel). Much of this operational and cost data has been supplied by the constituent councils, however some key data gaps remain. Working with the Authority, Wood is currently in the process of bridging these gaps to allow the completion of the cost modelling task. The cost model utilises key service information to produce a strategic cost assessment of the options.

5.3.2 More specifically, baseline modelling requires calibrating known inputs (such as tonnages collected and households served) to known outputs (such as the number of vehicles and crew required to

deliver the services). It is essential that the resources and logistics of the existing kerbside services are accurately reflected within the baseline so that it serves as a reliable foundation for testing alternative options. In summary, the baseline reflects:

- The composition of the kerbside waste and tonnages collected by different services;
- Current levels of participation, set out, recognition, capture;
- The characteristics of the Authority (for example, the number of households and rurality);
- Travel logistics; and
- Current staff, vehicle and container numbers, types and costs.

5.3.3 This will allow a credible basis to be formed from which to establish the change in resource requirements and costs for different potential future service configurations, ensuring that the specific constraints of the Authority are properly reflected. It is important to note that the output from the cost model is not in the form of a full budgeting cost model, and is an indicative estimate on which the impact of options can be gauged. Furthermore, the model is not a detailed routing tool or a comprehensive financial model but includes all costs that are relevant to the day-to-day operations of the key waste management activities, as identified below. Information from each council on the key costs of the service that fall within the scope of the options identified have been incorporated into the model and used to determine their baseline costs. The costs include the following variables:

- Number of vehicles & staff
- Annual cost rate for vehicles
- Annual frontline staff costs (collection crew and supervisors)
- Annual overheads
- Container replacement costs
- New container costs (if applicable)
- Facility gate fees and material prices (if applicable)

5.4 Baseline model assumptions

5.4.1 In order to evaluate kerbside waste and recycling collection options it was first necessary to gather underpinning information and data describing the nature of the Authority area, its population, tonnages collected and existing waste service performance. Data was primarily taken from WasteDataFlow (WDF) and supplemented by Authority provided data. It was from this base data that modelling parameters were developed (e.g. recycling yields) and approaches to filling gaps in existing knowledge, using informed assumptions, were agreed. Local and/or Authority-specific data was always used in preference to alternative data sources and/or default values to ensure the baseline model is as representative as possible.

5.4.2 Detail on the assumptions and other information used as inputs to the baseline and options modelling exercise will be provided as an appendix when these assumptions have been finalised. A description of the assumption sources and data that comprise them is included below.

Waste yield assumptions

5.4.3 Waste tonnages by source and material type were obtained from WDF data provided by the Authority. WDF provides a breakdown of recyclable materials collected by source, split by kerbside and HWRC/ CA site, and by household and commercial sources. When materials are collected comingled (as is the case for the constituent councils), however, WDF does not provide a detailed breakdown of the materials that comprise the comingled stream. Waste collected at HWRCs tend to be more detailed, because the majority of recyclables collected at HWRCs are separated at source.

5.4.4 To obtain a detailed breakdown of the comingled materials collected at the kerbside, composition studies carried out by the Authority in regular intervals were used. By combining the information included in the composition studies with the tonnages of comingled recycling collected, it was possible to obtain detailed breakdowns of the tonnages of the different materials comprising the comingled recycling stream. Where the composition of comingled recycling in a year was not available, a proxy composition was obtained by interpolating the values between available data intervals.

5.4.5 A similar approach was undertaken to estimate the composition of residual waste, in order to understand the breakdown of the type of materials and their tonnages in the total waste arisings and ensure that the capture rate of materials in the options modelling is held at realistic levels.

5.4.6 Waste yields were simply calculated by dividing the material tonnages collected in a constituent council by the total number of households in the council.

Operational assumptions

5.4.7 Operational assumptions relating to the kerbside services were provided by the constituent councils in proformas issues by Wood. Details obtained include:

- Collection service arrangements operated by each constituent council, such as the number of kerbside services operated and the household numbers and types on each service
- Types and numbers of resources required to deliver each service (collection crew, vehicles and containers)
- Logistical details associated with each service (travel logistics)
- Other useful operational details, such as the service participation and container set-out rates

Materials processing costs and sales income assumptions

5.4.8 These assumptions are currently under development and in the process of being agreed with the Authority and will be used in the final cost model to estimate the overall system costs associated with the baseline and each of the options.

Other cost assumptions

5.4.9 Other cost assumptions associated with the delivery of the kerbside services have been requested, and largely obtained, from the constituent councils. Such information revolves around details of the day-to-day operation of the kerbside services, and it includes staff, vehicle, container and other service delivery costs.

5.5 Carbon Impact

5.5.1 The carbon modelling is yet to be progressed but will utilise WRATE software; a tool for modelling the carbon and environmental impact of waste management services. WRATE (a copy of which is held by Wood under licence) allows the evaluation of the environmental impact of waste management options, from collection through to treatment / disposal, supporting a comprehensive assessment of options based on cost (where required), performance and environmental impact. The carbon modelling will be completed in January 2021.

6. Options Modelling

6.1 Options Identification

6.1.1 It is important the scenarios modelled align with the draft Environment Bill (2020) and associated draft Resources and Waste Strategy, currently under consultation; the Environment Bill builds on the government's decisive action to protect the environment, as set out in the 25 Year Environment Plan.

6.1.2 In developing the options, a review of policy documents was undertaken including the national Resources and Waste Strategy, The London Mayor's Environment Strategy and the respective local borough policies. The following section outlines the relevant policies and the focus and initiatives that have shaped the options agreed upon, noting that not all initiatives have been taken into account at the modelling stage due to uncertainties and lack of evidence and data to substantiate the approach. Some of the policies may become mandatory and/or may impact consumption patterns and products available to consumers, whereas some of the policies are non-statutory, local level aspirations and actions.

Option 1 Waste reduction per capita

Table 6.1 Option 1 relevant policies

Policy document	Relevant focus and initiatives	Implementation
Resource & Waste Strategy	Eliminating avoidable waste by 2050; removal of single use plastics; encouragement of re-use and lease schemes for white goods	Not enforced but changes may impact consumer behaviour, product selection and consumption patterns.
Mayor of London's Environment Strategy	Reduce and reuse strategies; focus on cutting single-use packaging and food waste by 20%; Local Authorities encouraged to prepare reduction and recycling plans.	Non-statutory target
Wandsworth Environment & Sustainability Strategy 2019 - 2030	Targets to reduce amount of waste generated from municipal buildings and quantity of household waste per household, reduction in single-use plastics.	Borough level target

6.1.3 Under option 1 an overall reduction in waste was modelled based on previous patterns of waste reduction observed in the last few years as well as factoring in initiatives and campaigns introduced to reduce food waste ('Love food, hate waste' campaign, Courtauld commitment) and those aimed at encouraging reuse of products.

Option 2 Increase in recycling rate

Table 6.2 Option 2 relevant policies

Policy document	Relevant focus and initiatives	Implementation
Resource & Waste Strategy	Key milestones: municipal waste recycling targets are set at 55% by 2025, 60% by 2030 and 65% by 2035, with a review clause in 2028. Overall packaging waste recycling targets are set at 65% by 2025 and 70% by 2030.	Mandatory target

Policy document	Relevant focus and initiatives	Implementation
	Extended Producer Responsibility (EPR) will be introduced in 2023, subject to consultation. It is not clear how this will be rolled out but if a separate collection of packaging was enforced then the boroughs recycling rate would increase.	Potential to be enforced
	Incentives to allow consumers to purchase sustainably with consistent labelling on packaging and consistent materials for recycling.	Not enforced but changes may impact consumer behaviour, product selection and consumption patterns.
	To ensure better waste collection and recycling the government will specify a core set of materials to be collected by all local authorities and waste operators; emphasise greater collection of glass separate from paper (the separate collection of glass will have a potential of increasing costs for the boroughs if more glass ends up in the residual stream); review collection models for densely populated commercial and residential districts to improve recycling; improve working arrangements and performance between local authorities, especially in 'two-tier' areas where a waste disposal authority (WDA) is responsible for disposing of waste collected by smaller district authorities (waste collection authorities, WCAs); consider the introduction of a tax on the incineration of waste further to consultation and review, should wider policies not deliver the Government's waste ambitions in the long-term.	Potential to be enforced
Mayor of London's Environment Strategy	Target to recycle 65 per cent of its municipal waste by 2030, and waste authorities should aim to achieve 45% household waste recycling rate by 2025 and 50% household waste recycling rate by 2030. Promotes recycling, particularly of high carbon and high value materials, such as plastic, metals and textiles. Local Authorities encouraged to prepare reduction and recycling plans, ensure a minimum level of recycling service, i.e., 6 main materials.	Non-statutory target Regional level aspirations
Wandsworth Environment & Sustainability Strategy 2019 - 2030	Target to increase the % municipal waste recycled 2019 – 2022	Borough level target
RBKC Air Quality and Climate Change Action Plan 2016 - 2021	Target to increase the municipal recycling rate by 2% from April 2019 to April 2020.	Borough level target

6.1.4 The Mayor's London Environment Strategy has set a target for 50% of local authority collected waste in London to be recycled by 2030, in order to help reach an overall 65% municipal target. A pragmatic approach has been taken into account, in agreement with the Authority, when identifying recycling targets, appreciating that urban areas have considerable barriers that prevent them from significantly improving their recycling rates.

6.1.5 Other initiatives, like those introduced by Resource London in their Flats recycling project, may improve recycling in purpose-built flats. The key message was good quality and well communicated services improve performance (textiles, food and plastic film were issues). The residents had lack of knowledge and access to good quality information – e.g., signs, access to bins. One of the solutions included the production of tenant packs - flats recycling package – which is to be rolled out to all flats in London. Findings showed a 24% decrease in overall contamination rates (from 31% to 23%). These packages may therefore help increase recycling rates in the London Boroughs.

6.1.6 Under option 2 an increase in the recycling rate was modelled, with a particular focus on plastics, but also considering wider remit as boroughs continue to tackle contamination through interventions as mentioned.

Option 3 Separate food waste collection to AD/IVC vs Status Quo

Table 6.3 Option 3 relevant policies

Policy document	Relevant focus and initiatives	Implementation
Resource & Waste Strategy	Separate food waste collections by 2023, subject to consultation. References that AD represents best environmental outcome for food waste that cannot be prevented.	Potential to be mandatory
Mayor of London's Environment Strategy	To make sure boroughs are providing separate food waste collections, the Mayor will hold copies of contract databases and will be alerted when contracts are due for renewal/ expiry. The recycling of materials (including anaerobic digestion) that are left from homes and businesses, and the value of truly non-recyclable waste should be maximised, by generating low carbon energy.	Potential to be mandatory Regional level aspiration
RBKC Air Quality and Climate Change Action Plan 2016 - 2021	Plan to review and model different waste collection systems and assess whether introducing a borough-wide food waste collection will be environmentally beneficial and identify solutions to improve waste collection rounds.	Borough level action

6.1.7 A waste composition analysis was undertaken by the Authority during a food waste trial in the South of the RBKC. Four surveys over a 12-month period were carried out to assess the impact of the food waste collection on the behaviour change that may encourage residents to think more about the food they are throwing away and to focus their attention on the dry recycling to test the theory that it could have a positive impact. The results showed that there was no impact on overall waste tonnages. Reduction in overall waste tonnages will therefore not be factored into the modelling.

6.1.8 Under option 3 a separate collection of food waste was modelled with carbon impacts between AD/IVC and the Status Quo (EfW) to also be assessed. There will be some level of carbon savings where food waste is currently disposed of via the general waste and incinerated, with AD treatment having a greater carbon saving over all other treatment routes. The effect that extracting the food waste has on the remaining composition of the residual waste stream that goes to EfW, was taken into account.

Option 4 Separate textiles collection

Table 6.4 Option 4 relevant policies

Policy document	Relevant focus and initiatives	Implementation
Resource & Waste Strategy	Separate collections for textiles by 2025, subject to consultation, with possible extension of HWRC services to include textiles recycling.	Potential to be mandatory

Policy document	Relevant focus and initiatives	Implementation
Mayor of London's Environment Strategy	Aim to maximise recycling rates targeting materials with high embodied carbon (plastics, metals and textiles).	Regional level aspiration

6.1.9 Under option 4 a separate textiles collection was modelled, with the textile waste stream being treated separately to all other streams. Reuse of textiles was prioritised in the future as they are carbon intensive materials. There may be an EPR for textiles but it is likely local authorities will be encouraged to collect textiles separately in the future to enable reuse in the textile industry and for charities.

6.1.10 A kerbside collection of textiles has been assumed, collecting in kerbside bags, which may be relatively easy to add to the existing collection service, vehicle dependant.

Option 5 Reduction of packaging waste (DRS assessment)

Table 6.5 Option 5 relevant policies

Policy document	Relevant focus and initiatives	Implementation
Resource & Waste Strategy	EPR of packaging by 2023, subject to consultation; eliminate avoidable plastic waste; removal of certain single use plastics; Deposit return scheme (DRS); public water refilling points to reduce plastic bottle consumption	EPR will be mandatory
Mayor of London's Environment Strategy	Focus on cutting single-use packaging and food waste by 20%; trialling a DRS for drinks containers, while government decides what it will do at a national level.	Regional level action/aspirations
Wandsworth Environment & Sustainability Strategy 2019 - 2030	Target set for 50% reduction in all single use plastics from council operations (2019 – 2021).	Borough level target

6.1.11 Under option 5 a reduction in packaging waste was modelled through a DRS based assessment.

6.1.12 As extended producer responsibility (EPR) is still in the consultation stage with no final conclusions available, and due to there being limited data available to inform a service level impact (i.e. the reform will impact the service from a funding point of view as well as potential packaging diversion from residual waste however the scale of impact for each is uncertain), it was agreed with the Authority to exclude this impact from the options modelling.

6.1.13 As option 1 considers a reduction in single use packaging, we focused on just drinks containers in this assessment as this will show the specific changes following implementation of a DRS.

Option 6 Low carbon transport options

Table 6.6 Option 6 relevant policies

Policy document	Relevant focus and initiatives	Implementation
Mayor of London's Environment Strategy	Mayors Environment Strategy - expects LAs to use fewer and cleaner lorries to transport waste. They must demonstrate how they will transition their waste fleets to low or zero emission options, prioritising the phasing out of diesel. The overall ambition is that all heavy vehicles will be fossil free from 2030,	Regional level aspiration/action

Policy document	Relevant focus and initiatives	Implementation
	with zero emission fleets by 2050. Fossil-fuel free can include the use of 100 per cent renewable fuels derived from sources such as food waste and waste oils.	
(Lambeth) Corporate Carbon Reduction Plan	Put electric vehicle infrastructure in place, using low-emission vehicles when necessary. Only ultra-low emission vehicles will be able to be leased by 2022.	Borough level action
Wandsworth Environment & Sustainability Strategy 2019 - 2030	Reduce emissions of vehicle fleet with a roll out of low emission fleet vehicles with a plan for all council vehicles to be powered by electric or renewable fuel sources by 2030.	Borough level action/aspiration
RBKC Air Quality and Climate Change Action Plan 2016 - 2021	Work with their waste contractor to reduce emissions from its fleet and improve their operations with a target of 35% reduction versus 2007-2008.	Borough level action/aspiration

6.1.14 Under option 6 alternative transport options were modelled, and this included the use of 100% electric vehicles. We understand diesel powered barges are used for residual waste and the contractor is looking at cleaning up their emissions, so the focus of the study is on the HGVs and other refuse vehicles used.

Option 7 Alternate weekly collections (AWC)

6.1.15 There are no relevant policies relevant to this option, but this collection system is commonly used by Local Authorities in England. As evidenced through previous modelling work Wood have undertaken for a number of local authorities, when the collection frequency is reduced a reduction in the number of vehicles on the road and in-service costs are observed. We would therefore expect to see a reduction in carbon. Indirectly, AWC has been linked with an increase in recycling and a potential reduction in residual waste. The waste flows relating to a change of service to AWC has already been modelled, and the impact of AWC on the collection resources and costs is being appraised for street level properties as we recognise this is unrealistic for flats.

Option 8 Separate Garden Waste Collection

Table 6.7 Option 8 relevant policies

Policy document	Relevant focus and initiatives	Implementation
Resource & Waste Strategy	It is currently being consulted whether households with gardens should have access to free garden waste collections.	Potential to be mandatory

6.1.16 A separate garden waste collection was modelled for the constituent councils. The effect that extracting the garden waste has on the remaining composition of the residual waste stream that goes to EfW, will be taken into account.

Options for modelling

6.1.17 In summary, the following waste management options were selected for modelling, as agreed with the Authority:

- Option 1: waste reduction per capita
- Option 2: increase in recycling rate

- Option 3: Separate food waste collection to AD/IVC vs Status Quo
- Option 4: Separate textiles collection
- Option 5: Reduction of packaging waste (DRS assessment)
- Option 6: Low carbon transport options
- Option 7: Alternate weekly collections (AWC)
- Option 8: Separate garden waste collection Vs the Status Quo

6.2 Options modelling

6.2.1 The options modelling task could be split into two distinct parts:

- Waste flow modelling
- Resource and cost modelling

6.2.2 The waste flow modelling of the options has been completed for the constituent councils and the Authority as a whole. The option waste flows have been developed by applying sets of assumptions on the calculated baseline flows. These assumptions are outlined below.

6.2.3 The modelling of the resources required to deliver the options and their associated costs are currently in development as some key data gaps exist, and the constituent councils have been requested to provide the missing service details and any clarifications.

6.2.4 It was agreed with the Authority that a high-level collections modelling exercise would be undertaken for options 3, 7 and 8, by averaging resources required across service delivery for individual constituent councils. No changes in resource requirements have been assumed for all other options.

6.2.5 Lambeth services are being modelled to show the collection of food and garden waste separately, as well as their current co-collection, to allow a comparison between both collection options.

Option assumptions

6.2.6 The assumptions used in the options modelling can be found in Table 6.8.

6.2.7 Using the baseline waste flow model as a template, copies were made and the model inputs adjusted according to agreed assumptions for each option. The model allows full flexibility to modify any of the variables that affect waste flows. Where data has not been available, pre-agreed default values have been utilised.

Table 6.8 Option modelling assumptions

Policy or Authority driven	Assumption	Evidence/data
Option 1 Waste reduction per capita: An overall reduction in waste will be modelled (assumed only applicable to households)		
Borough/WRWA driven	• The average trend of waste arisings (assumed reduction) over the last five years continues into the future • 2019/20 yield/hh data was used as the starting point for the projections	Data trend
Government policies/Borough/WRWA driven	• 20% reduction in food waste by 2025 using a 2015 baseline (Courtauld Commitment)	Target
Government policies	• Removal of single-use plastics (SUP) - 25% reduction in 'carrier bags', 'other non-packaging wrap and film' and 'polystyrene'; reduction achieved by 2030 and applied to the 2019 yields • No reduction in PTTs; plastic appears to be the best material for the items contained in these, e.g. yoghurt, butter, dairy	Unsure of impact, non-quantifiable assumption, educated guess
Borough driven	• 20% of households sign up to the Mailing Preference Service (MPS) with an average reduction in 77% of unwanted mail by 2030	Essex County Council case study
Option 2 Increase in recycling rate: An increase in the recycling rate considering wider remit as boroughs continue to tackle contamination through interventions (assumed only applicable to households)		
Government policies/Borough driven	• Households achieve a 35% recycling rate by 2025 and 40% by 2030, as opposed to households achieving 45% household waste recycling rate by 2025 (50% by 2030) as per the Mayors non-binding target • Note: 40% recycling rate with no organics recycling translates to incredibly high dry recycling capture rates which may not be realistic - the Boroughs that are not currently collecting food waste (Wandsworth and H&F) have therefore been modelled assuming that a food waste collection service is introduced by 2025, as well as full service roll out for Lambeth and RBKC.	Recycling rates of inner London boroughs (Southwark currently are best in class at 35%)
Government policies	• Continuation of comingled collection with no separation of materials, e.g. glass	Separating materials at the kerbside may be difficult in an urban setting and could cause storage issues for the households, so a simple approach whereby the current service continues has been assumed

Policy or Authority driven	Assumption	Evidence/data
Option 3 Separate food waste collection to AD/IVC vs Status Quo: A separate collection of food waste will be modelled with carbon impacts between AD and IVC assessed		
Government policies/Borough driven	• No change in overall waste generated at household level or in the recycling rate of DMR and a food waste yield of 0.9 kg/hh/week for all boroughs, to be in effect by 2023	WRWA data (food waste trials)
Option 4 Separate textiles collection: A separate textiles collection will be modelled, with the textile waste stream being treated separately to all other streams		
Borough driven / Government Policies	• Textile yield of 1.1kg/hh/yr	LB Bexley textiles collection service trial
	• Textiles collection commences in 2022; collections would either be carried out by existing rounds (given the low yields) or collected by charities	
	• Income rate based on average of 2019 textile banks textile prices: £185/tonne • Saving of £154 per tonne in disposal plus £28 per tonne for textiles wrongly placed in the comingled recycling sacks	LetsRecycle 2019 data
Option 5: Reduction of packaging waste: a reduction in packaging waste would be modelled through a DRS based assessment.		
Government policies	• DRS 'all-in' option in 2023 and that 85% of the following materials are transferred from kerbside recycling and refuse waste collections to DRS recycling collections: PET drinks bottles, steel and aluminium drink cans and glass drinks bottles • The remaining 15% goes to kerbside • Saving of £154 per tonne in disposal and £28 per tonne for all materials retrieved through DRS	Defra EPR impact assessment
Option 6: Low carbon transport options: Alternative transport options would be modelled, and this could include one of the following: 100% electric/hybrid; Biomethane from food waste/waste oil; Ultra-Low emission vehicles, e.g. euro6 compliant		
Government policies/Borough driven	• On basis of recent trials, electric vehicles to be used in any future vehicle change	Trend
Option 7: Alternate Weekly Collections (AWC)		

Policy or Authority driven	Assumption	Evidence/data
Borough driven	• Applicable to kerbside properties only • Evidence from WRAP on reducing frequency of collections (+11% in dry recycling capture compared from moving residual waste to fortnightly from weekly)	WRAP research
Option 8 Separate Garden Waste Collections		
Government policies/Borough driven	• Applicable to kerbside properties only • Lambeth participation/ service take-up rate of 6% of the street level properties • Projected kerbside yield of 95.6 kg/hh/yr per household participating • Maximum level of participation level reached in year 3/4 from the introduction of the service	Lambeth data

6.3 Waste Flow Modelling Outputs

6.3.1 The following section provides the graphical outputs of the waste flow modelling for options 1-5, 7-8. Option 6 will not have a change in waste flows as it focusses on vehicle configuration. The outputs are presented for the Authority area as a whole and documents the trends in waste flow in line with the agreed assumptions.

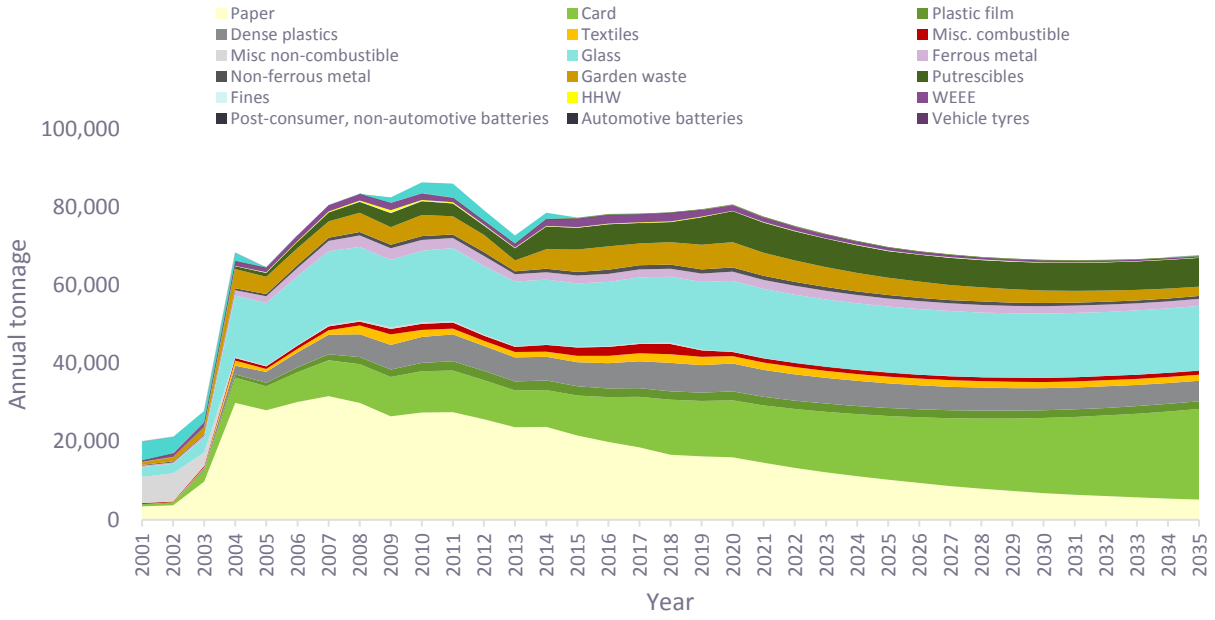
Option 1 Waste reduction per capita

6.3.2 The assumptions behind option 1, as referred to in table 6.8, are as follows:

- The average trend of waste arisings (assumed reduction) over the last five years continues into the future
- 2019/20 yield/hh data was used as the starting point for the projections
- 20% reduction in food waste by 2025 using a 2015 baseline (Courtauld Commitment)
- Removal of single-use plastics (SUP) - 25% reduction in 'carrier bags', 'other non-packaging wrap and film' and 'polystyrene'; reduction achieved by 2030 and applied to the 2019 yields
- No reduction in PTTs; plastic appears to be the best material for the items contained in these, e.g. yoghurt, butter, dairy
- 20% of households sign up to the Mailing Preference Service (MPS) with an average reduction in 77% of unwanted mail by 2030.

6.3.3 Figure 6.1 disaggregates the collected household recycling into its component categories. This illustrates the historical and projected variation in material tonnage collected by the authority using this option.

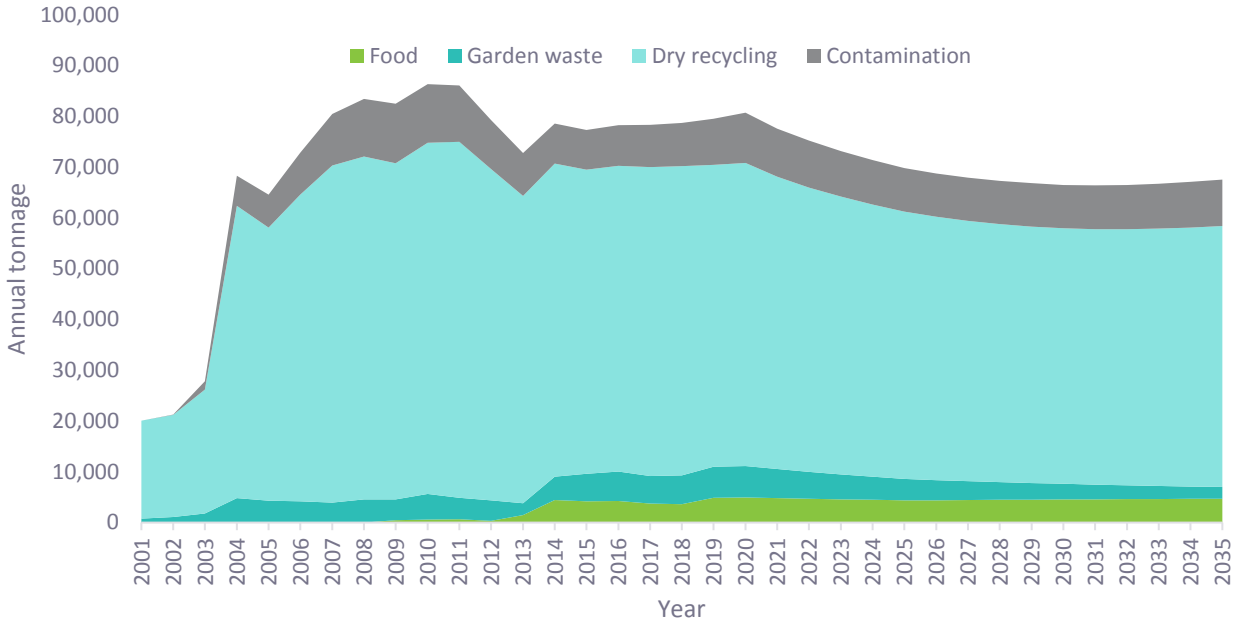
Figure 6.1 Option 1 - Total collected household recycling composition



6.3.4 Figure 6.2 disaggregates the net household recycling into four major categories; food waste, garden waste, dry recyclable material and contamination – material that cannot be recycled. This

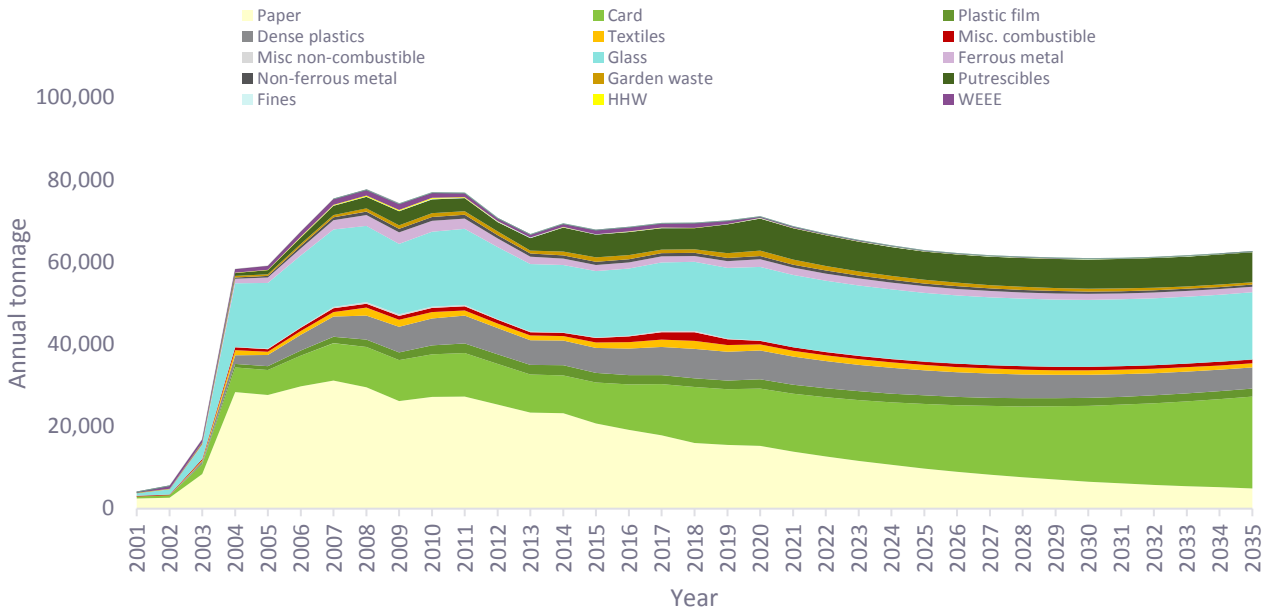
illustrates the level of contamination collected within the dry recycling stream. Dry recycling includes all recyclable materials including textiles and WEEE but excludes food and garden waste.

Figure 6.2 Option 1 - High level net household recycling composition



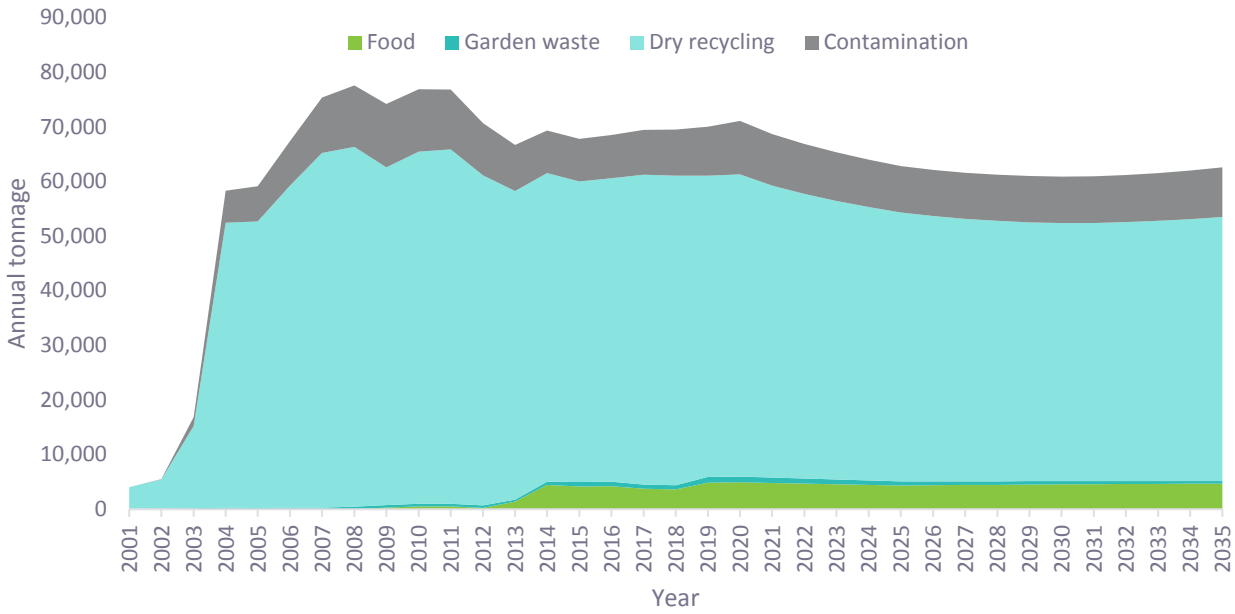
6.3.5 Figure 6.3 disaggregates the net kerbside household recycling into its component categories. This illustrates the historical and projected variation in material tonnage collected by the authority using this option.

Figure 6.3 Option 1 - Kerbside collected household recycling composition



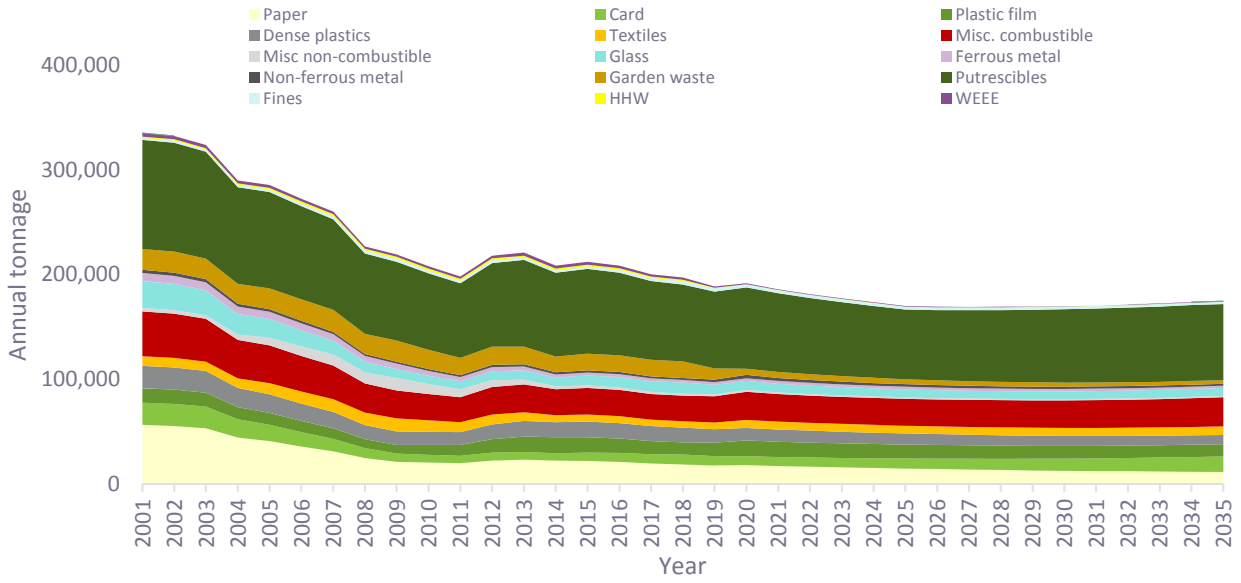
6.3.6 Figure 6.4 disaggregates the net kerbside recycling into four major categories; food waste, garden waste, dry recyclable material and contamination – material that cannot be recycled. This illustrates the level of contamination collected within the dry recycling stream. Dry recycling includes all recyclable materials including textiles and WEEE but excludes food and garden waste.

Figure 6.4 Option 1 - High level net kerbside recycling composition



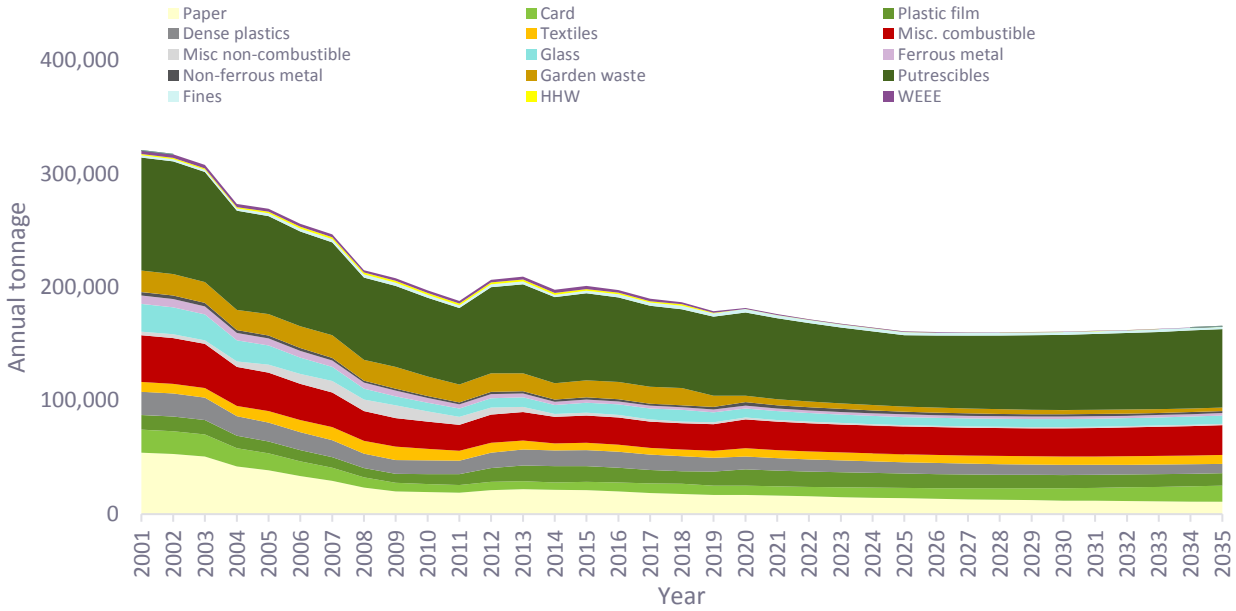
6.3.7 Figure 6.5 disaggregates the total collected residual waste stream into its component categories. This illustrates the historical and projected variation in material tonnage collected by the authority using this option.

Figure 6.5 Option 1 - Total collected household residual waste composition



6.3.8 Figure 6.6 disaggregates the Kerbside collected residual waste stream into its component categories. This illustrates the historical and projected variation in material tonnage collected by the authority using this option.

Figure 6.6 Option 1 - Kerbside collected residual waste composition



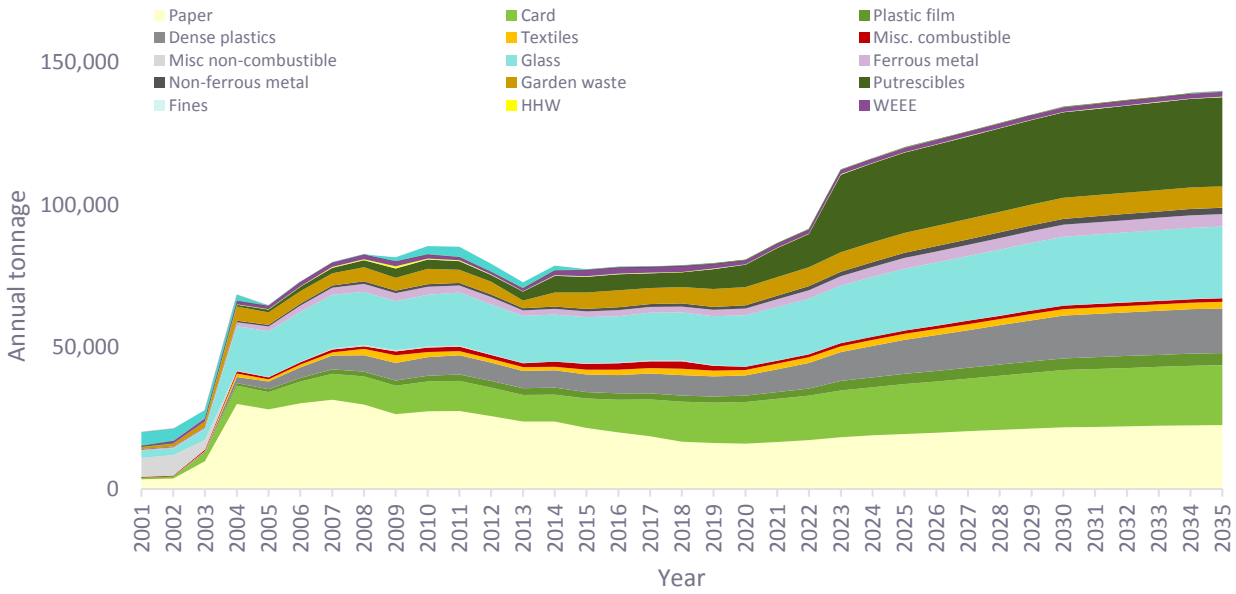
Option 2 Increase in recycling rate

6.3.9 The assumptions behind option 2, as referred to in table 6.8, are as follows:

- Households achieve a 35% recycling rate by 2025 and 40% by 2030, as opposed to households achieving 45% household waste recycling rate by 2025 (50% by 2030) as per the Mayors non-binding target
- Note: 40% recycling rate with no organics recycling translates to incredibly high dry recycling capture rates which may not be realistic - the Boroughs that are not currently collecting food waste (Wandsworth and H&F) have therefore been modelled assuming that a food waste collection service is introduced by 2025, as well as full service roll out for Lambeth and RBKC.
- Continuation of comingled collection with no separation of materials, e.g. glass.

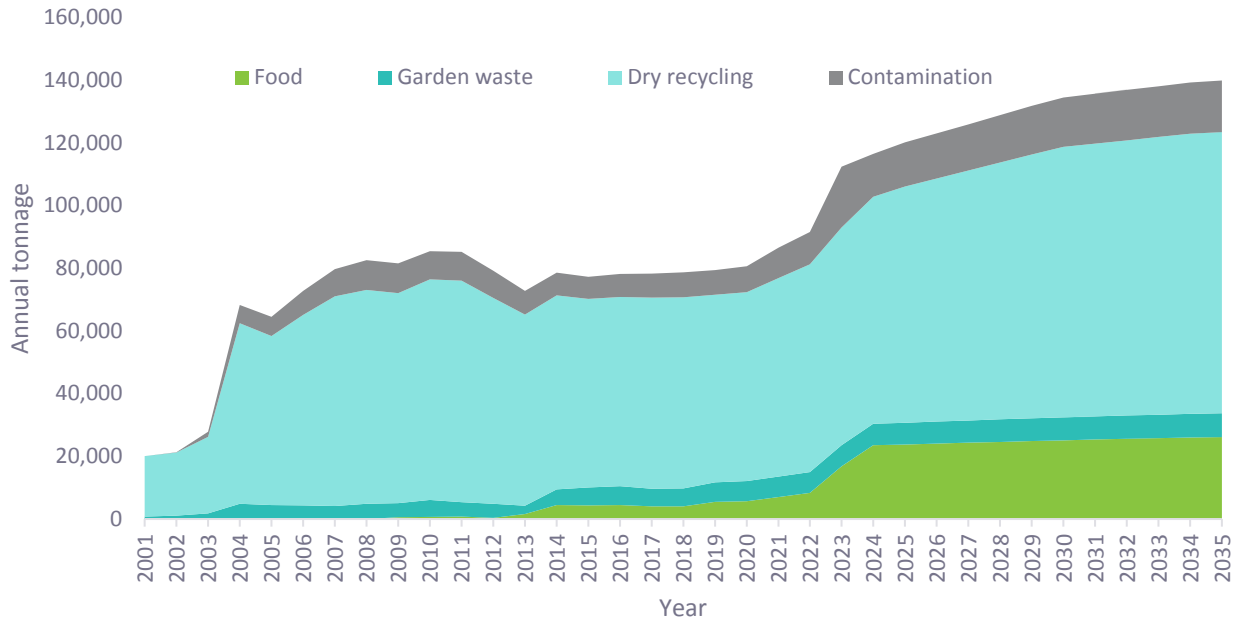
6.3.10 Figure 6.7 disaggregates the collected household recycling into its component categories. This illustrates the historical and projected variation in material tonnage collected by the authority using this option.

Figure 6.7 Option 2 - Total collected household recycling composition



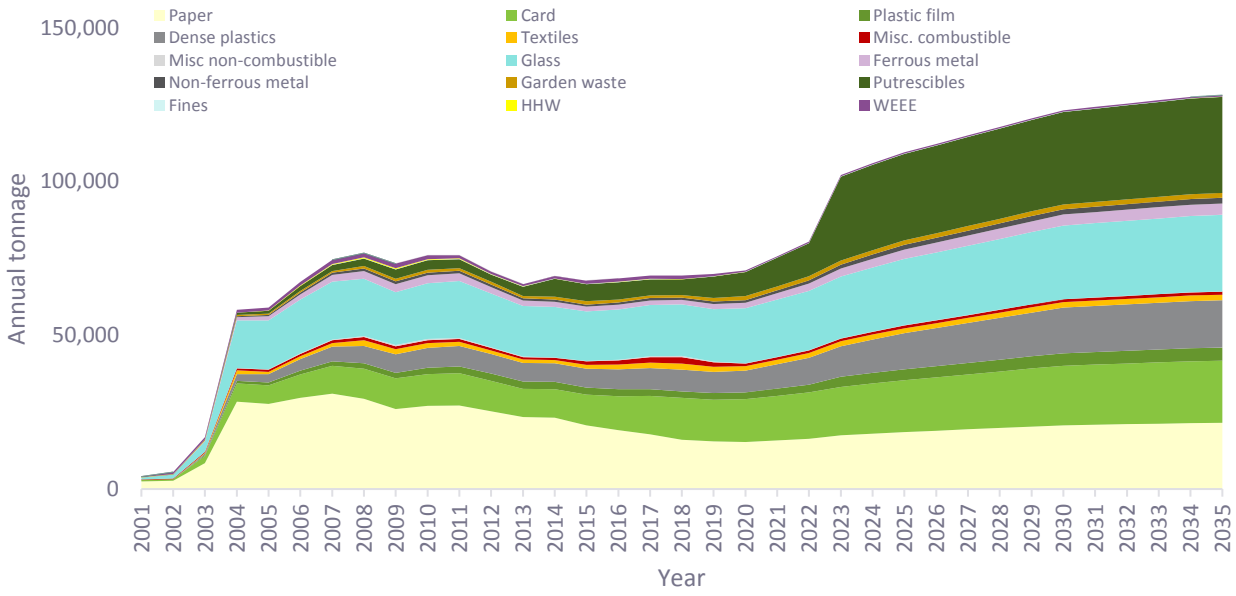
6.3.11 Figure 6.8 disaggregates the net kerbside recycling into four major categories; food waste, garden waste, dry recyclable material and contamination – material that cannot be recycled. This illustrates the level of contamination collected within the dry recycling stream. Dry recycling includes all recyclable materials including textiles and WEEE but excludes food and garden waste.

Figure 6.8 Option 2 - High level net household recycling composition



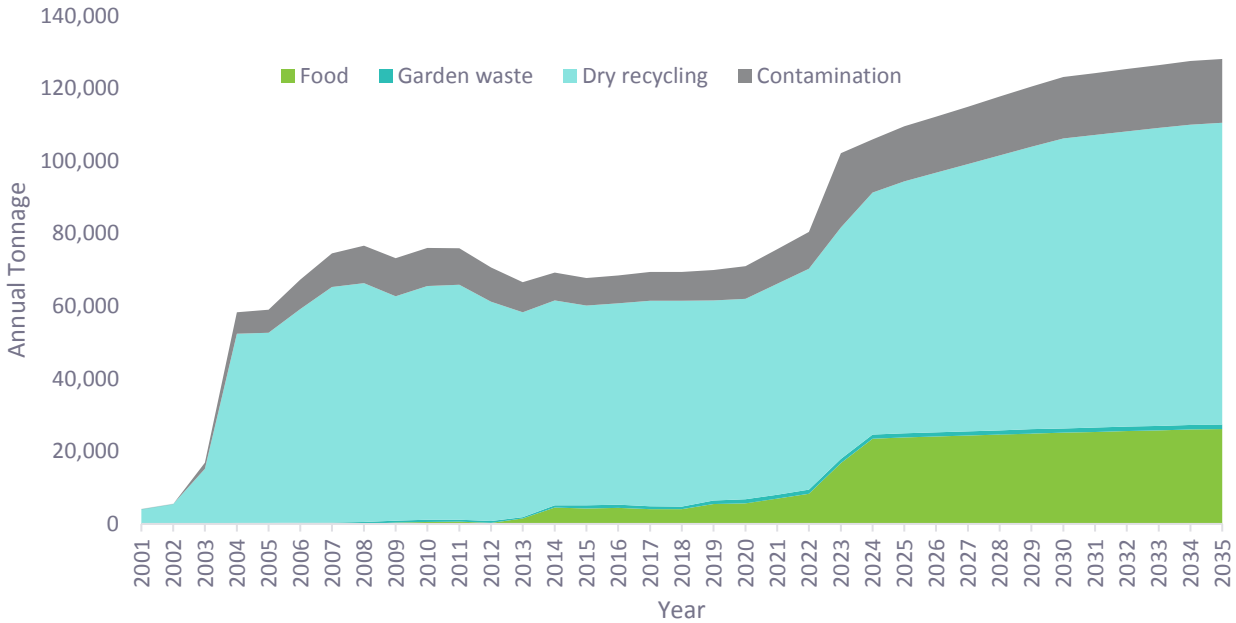
6.3.12 Figure 6.9 disaggregates the net kerbside recycling into its component categories. This illustrates the historical and projected variation in material tonnage collected by the authority using this option.

Figure 6.9 Option 2 - Kerbside collected household recycling composition



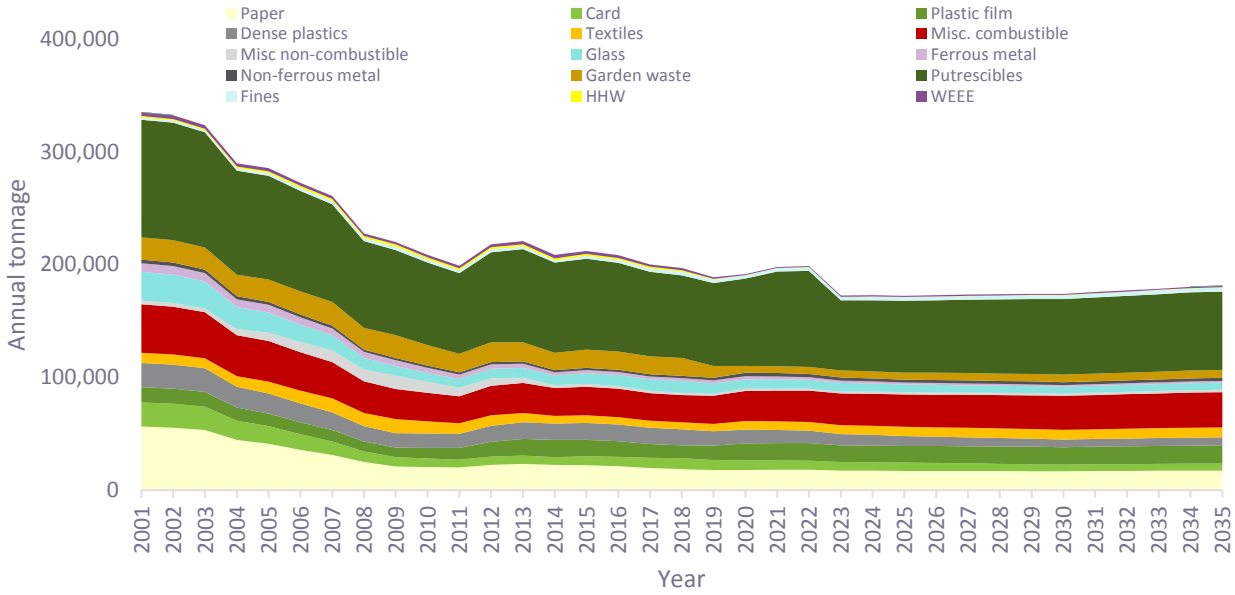
6.3.13 Figure 6.10 disaggregates the net kerbside recycling into four major categories; food waste, garden waste, dry recyclable material and contamination – material that cannot be recycled. This illustrates the level of contamination collected within the dry recycling stream. Dry recycling includes all recyclable materials including textiles and WEEE but excludes food and garden waste.

Figure 6.10 Option 2 - High level net kerbside recycling composition



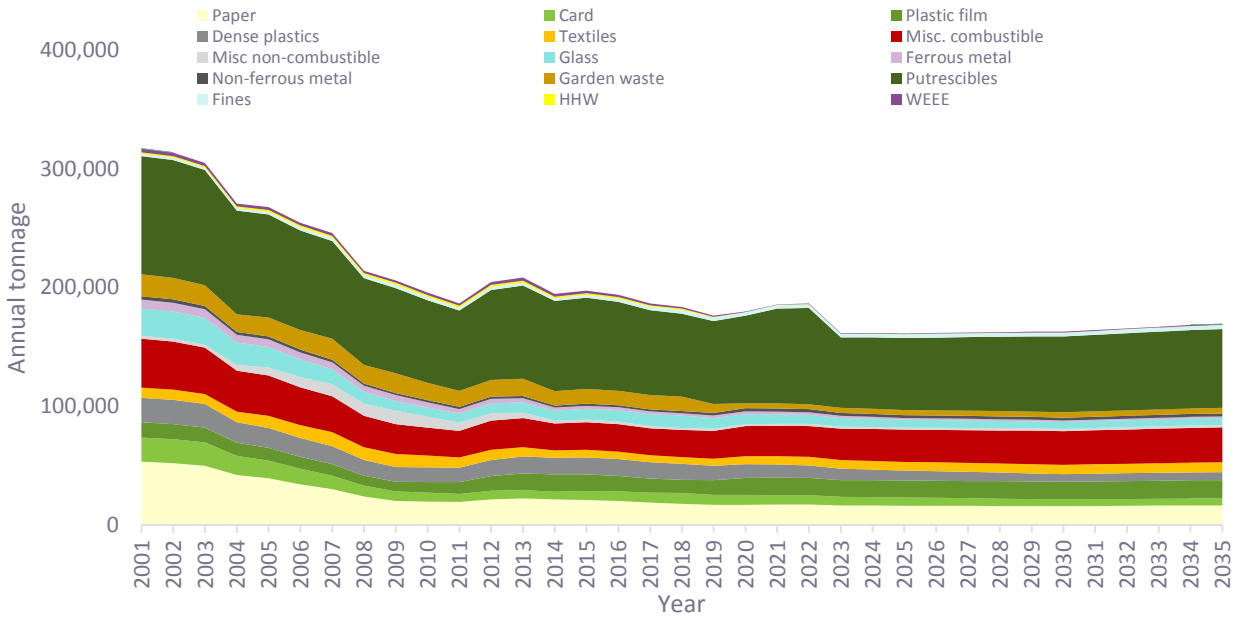
6.3.14 Figure 6.11 disaggregates the total collected residual waste stream into its component categories. This illustrates the historical and projected variation in material tonnage collected by the authority using this option.

Figure 6.11 Option 2 - Total collected household residual waste composition



6.3.15 Figure 6.12 disaggregates the Kerbside collected residual waste stream into its component categories. This illustrates the historical and projected variation in material tonnage collected by the authority using this option.

Figure 6.12 Option 2 - Kerbside collected residual waste composition



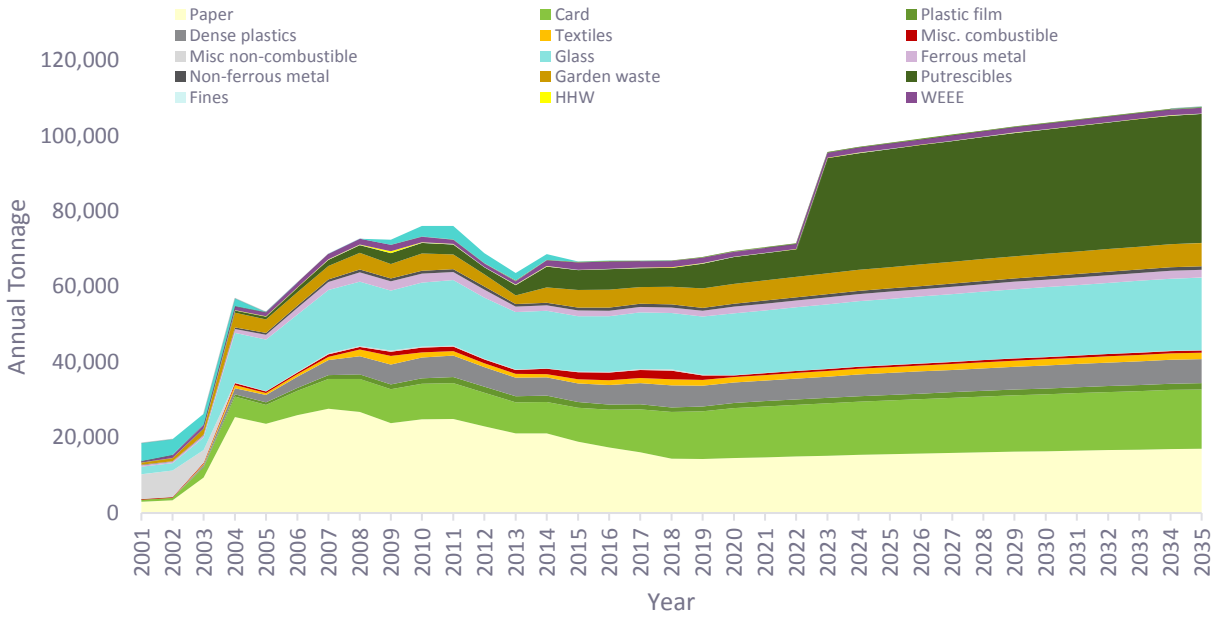
Option 3 Separate food waste collection to AD/IVC vs Status Quo

6.3.16 The assumptions behind option 3, as referred to in table 6.8, are as follows:

- No change in overall waste generated at household level or in the recycling rate of DMR and a food waste yield of 0.9 kg/hh/week for all boroughs, to be in effect by 2023.

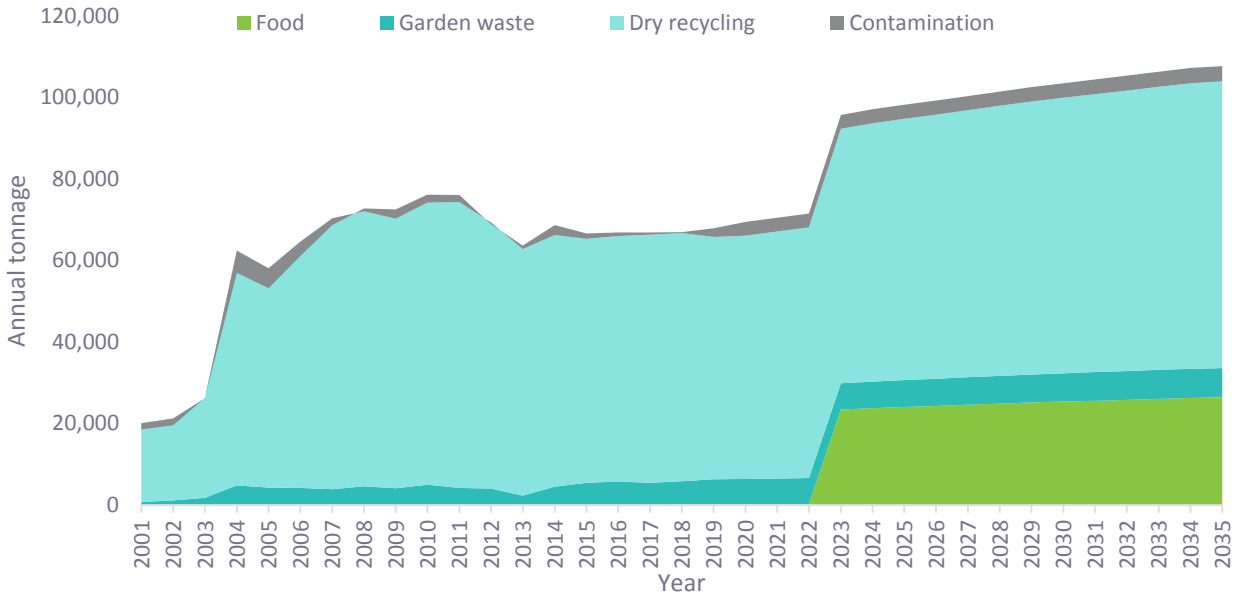
6.3.17 Figure 6.13 disaggregates the collected household recycling into its component categories. This illustrates the historical and projected variation in material tonnage collected by the authority using this option.

Figure 6.13 Option 3 - Total collected household recycling composition



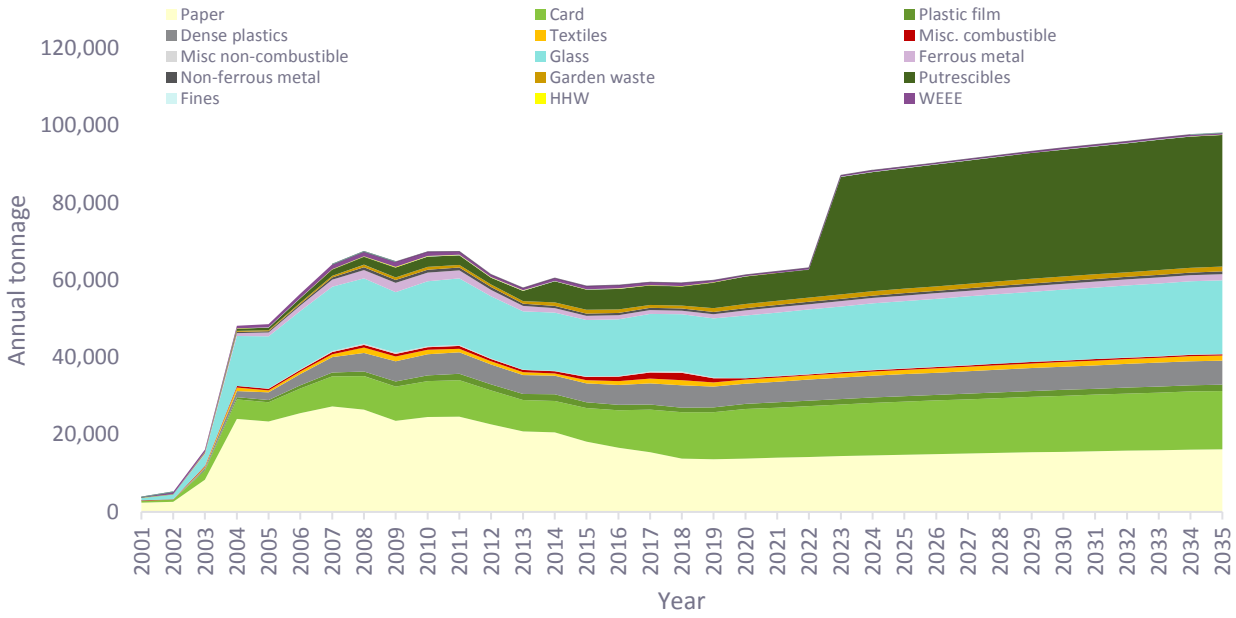
6.3.18 Figure 6.14 disaggregates the net household recycling into four major categories; food waste, garden waste, dry recyclable material and contamination – material that cannot be recycled. This illustrates the level of contamination collected within the dry recycling stream. Dry recycling includes all recyclable materials including textiles and WEEE but excludes food and garden waste.

Figure 6.14 Option 3 - High level net household recycling composition



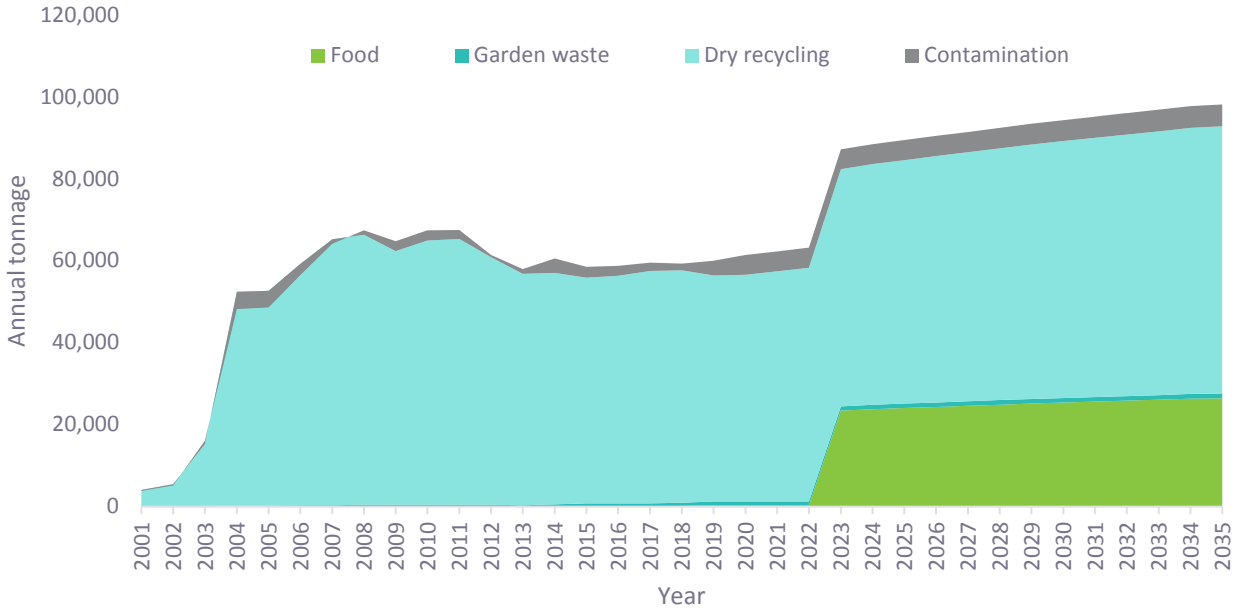
6.3.19 Figure 6.15 disaggregates the net kerbside recycling into its component categories. This illustrates the historical and projected variation in material tonnage collected by the authority using this option.

Figure 6.15 Option 3 - Kerbside collected household recycling composition



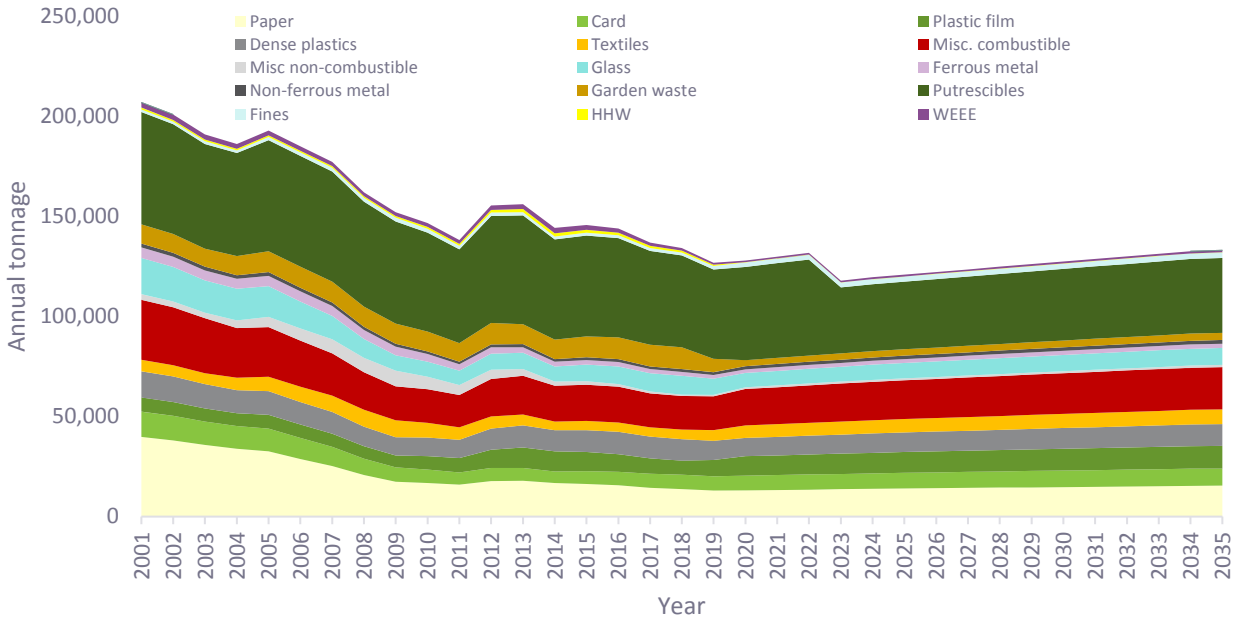
6.3.20 Figure 6.16 disaggregates the net kerbside recycling into four major categories; food waste, garden waste, dry recyclable material and contamination – material that cannot be recycled. This illustrates the level of contamination collected within the dry recycling stream. Dry recycling includes all recyclable materials including textiles and WEEE but excludes food and garden waste.

Figure 6.16 Option 3 - High level net kerbside recycling composition



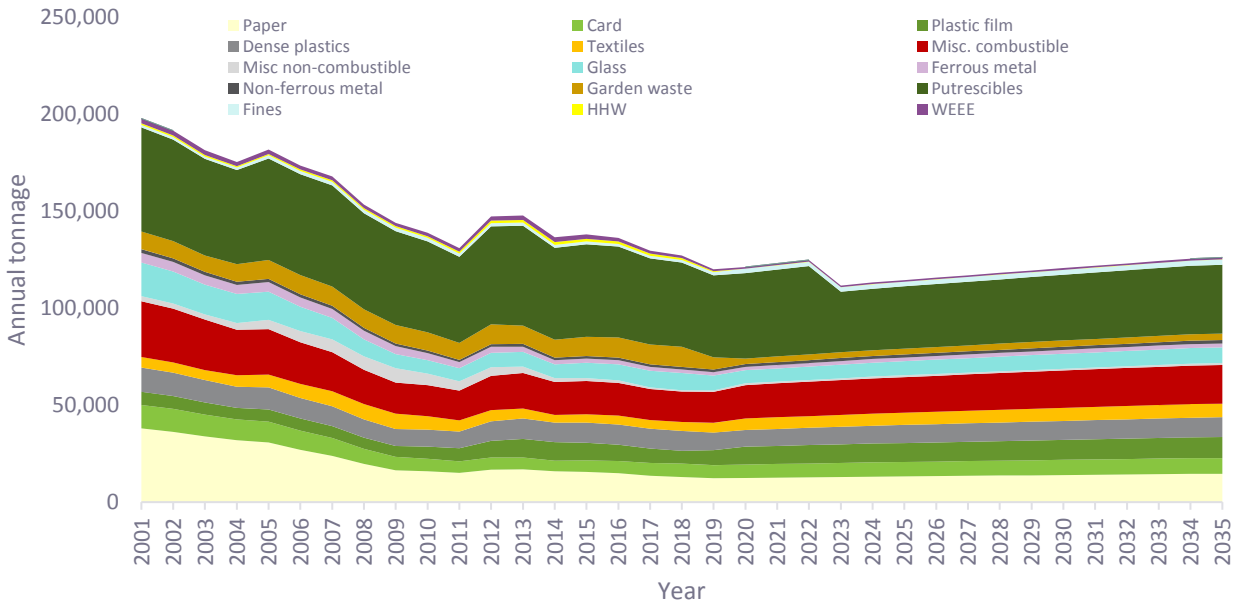
6.3.21 Figure 6.17 disaggregates the total collected residual waste stream into its component categories. This illustrates the historical and projected variation in material tonnage collected by the authority using this option.

Figure 6.17 Option 3 - Total collected household residual waste composition



6.3.22 Figure 6.18 disaggregates the Kerbside collected residual waste stream into its component categories. This illustrates the historical and projected variation in material tonnage collected by the authority using this option.

Figure 6.18 Option 3 - Kerbside collected residual waste composition



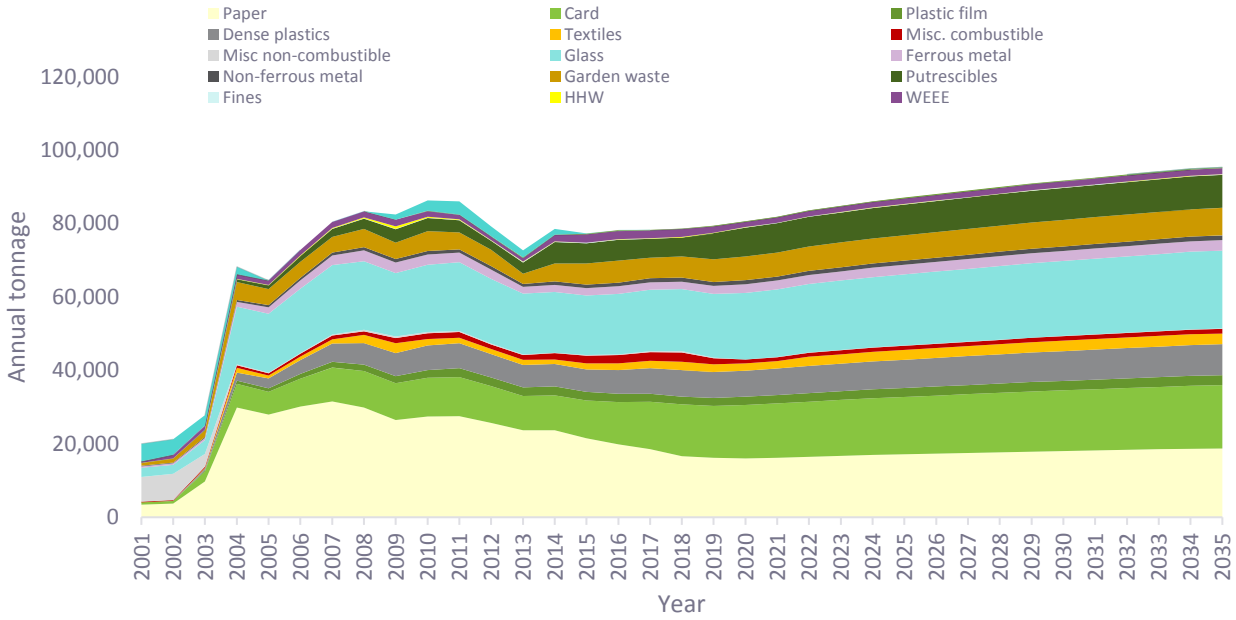
Option 4 Separate textiles collection

6.3.23 The assumptions behind option 4, as referred to in table 6.8, are as follows:

- Textile yield of 1.1kg/hh/yr
- Textiles collection commences in 2022; collections would either be carried out by existing rounds (given the low yields) or collected by charities.

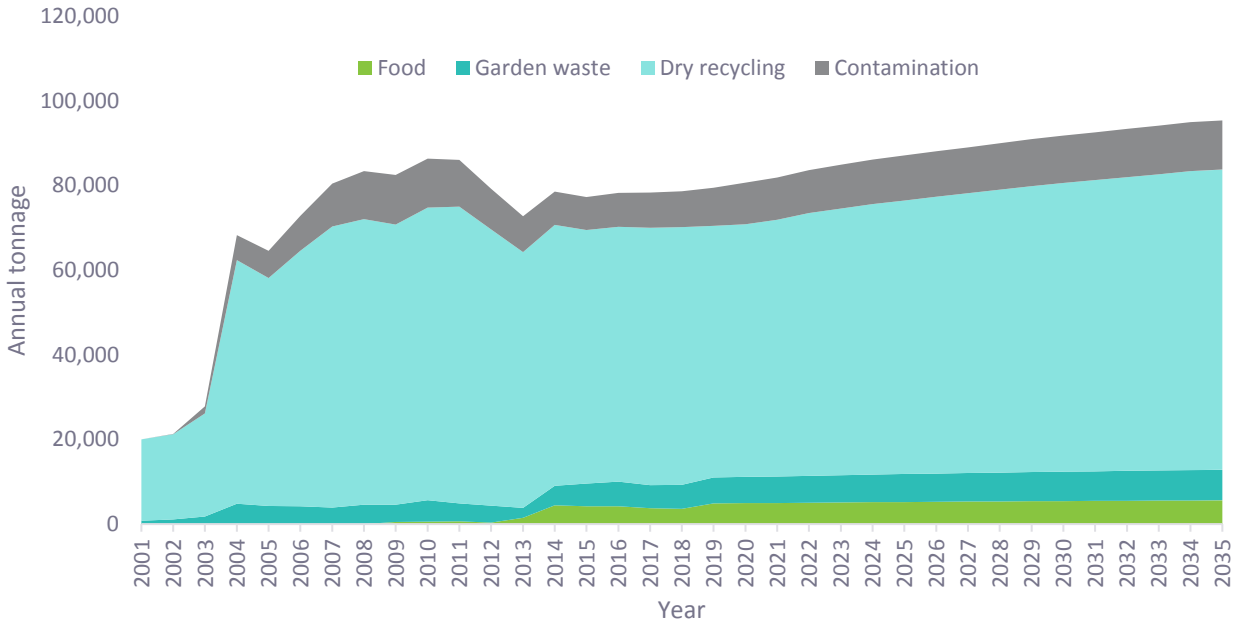
6.3.24 Figure 6.19 disaggregates the collected household recycling into its component categories. This illustrates the historical and projected variation in material tonnage collected by the authority using this option.

Figure 6.19 Option 4 - Total collected household recycling composition



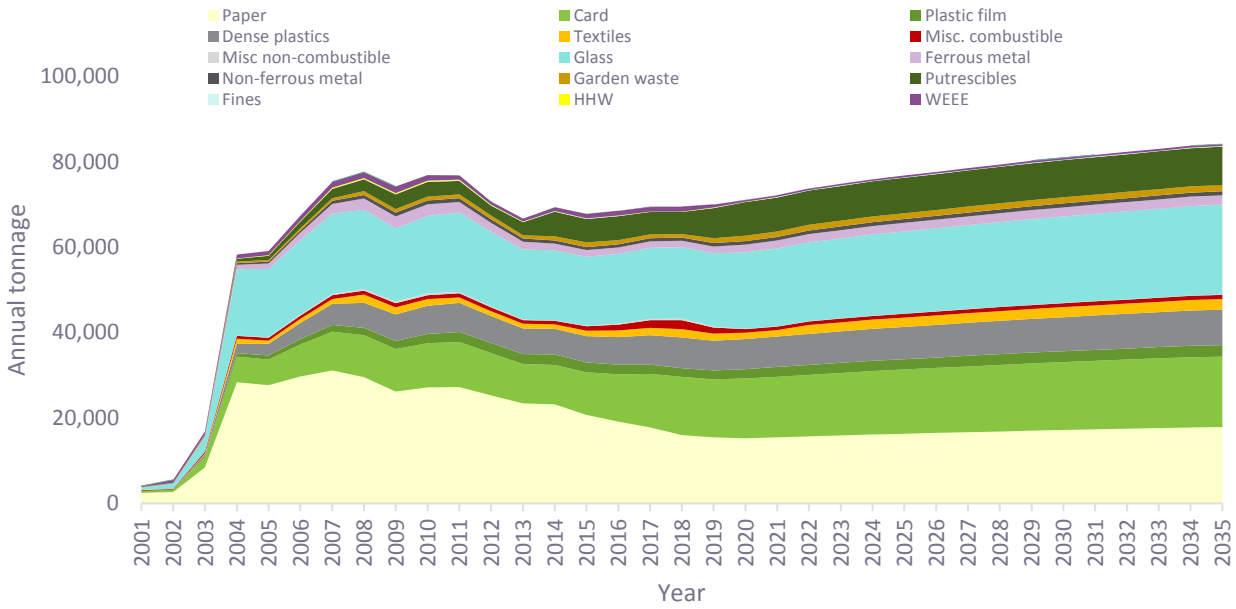
6.3.25 Figure 6.20 disaggregates the net household recycling into four major categories; food waste, garden waste, dry recyclable material and contamination – material that cannot be recycled. This illustrates the level of contamination collected within the dry recycling stream. Dry recycling includes all recyclable materials including textiles and WEEE but excludes food and garden waste.

Figure 6.20 Option 4 - High level net household recycling composition



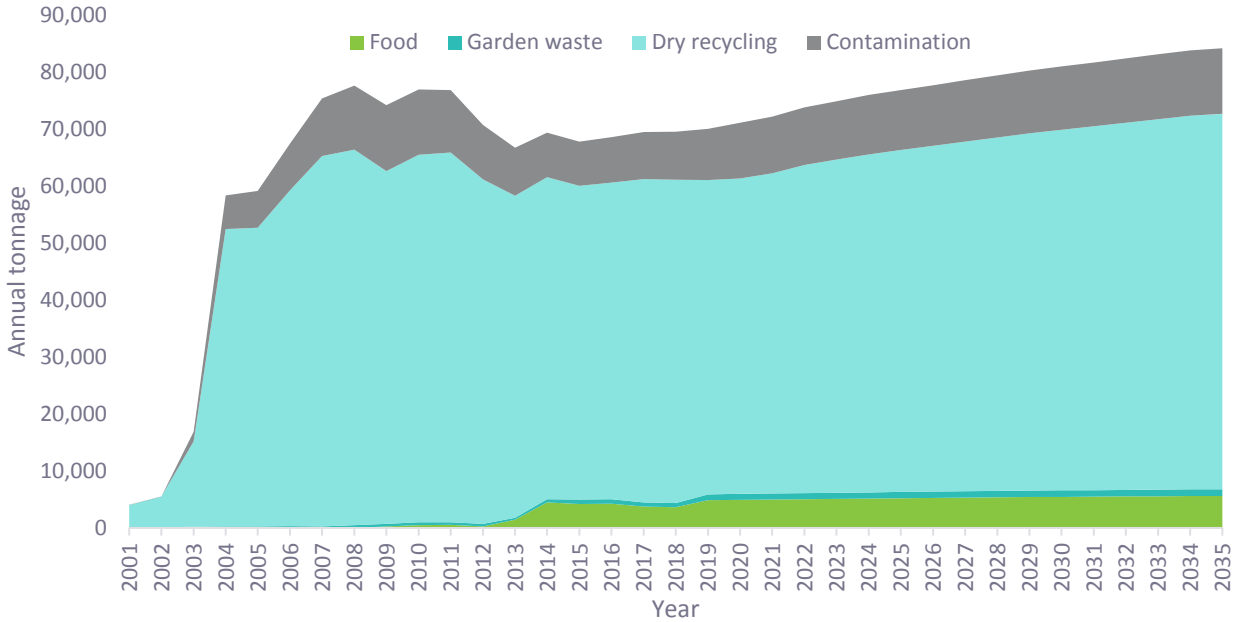
6.3.26 Figure 6.21 disaggregates the net kerbside recycling into its component categories. This illustrates the historical and projected variation in material tonnage collected by the authority using this option.

Figure 6.21 Option 4 - Kerbside collected household recycling composition



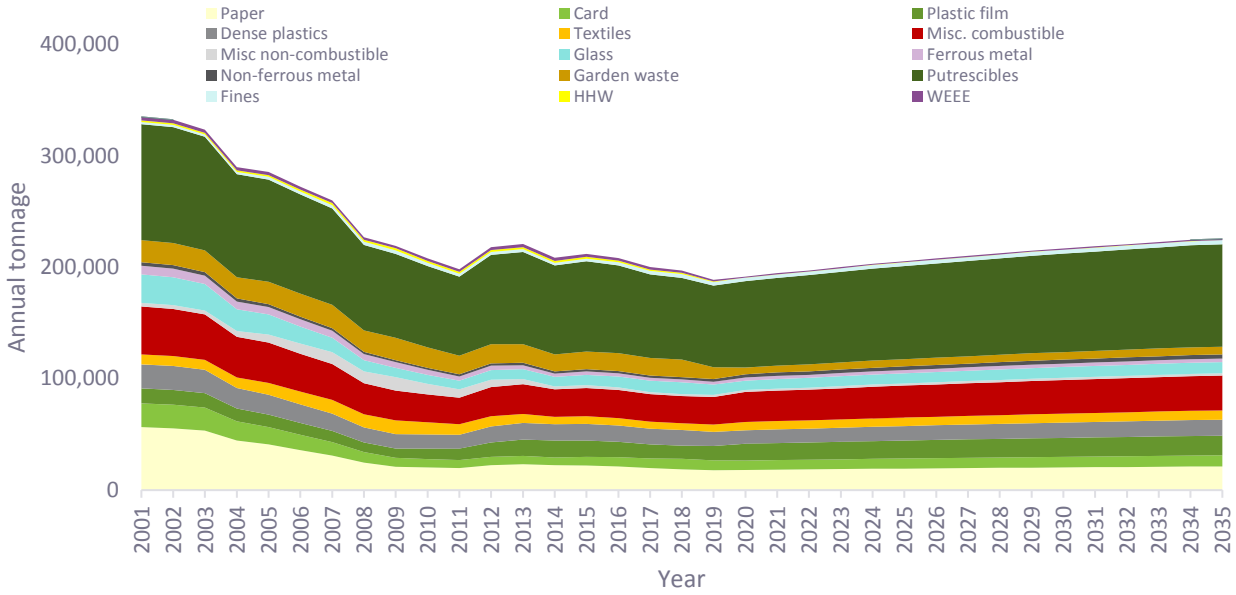
6.3.27 Figure 6.22 disaggregates the net kerbside recycling into four major categories; food waste, garden waste, dry recyclable material and contamination – material that cannot be recycled. This illustrates the level of contamination collected within the dry recycling stream. Dry recycling includes all recyclable materials including textiles and WEEE but excludes food and garden waste.

Figure 6.22 Option 4 - High level net kerbside recycling composition



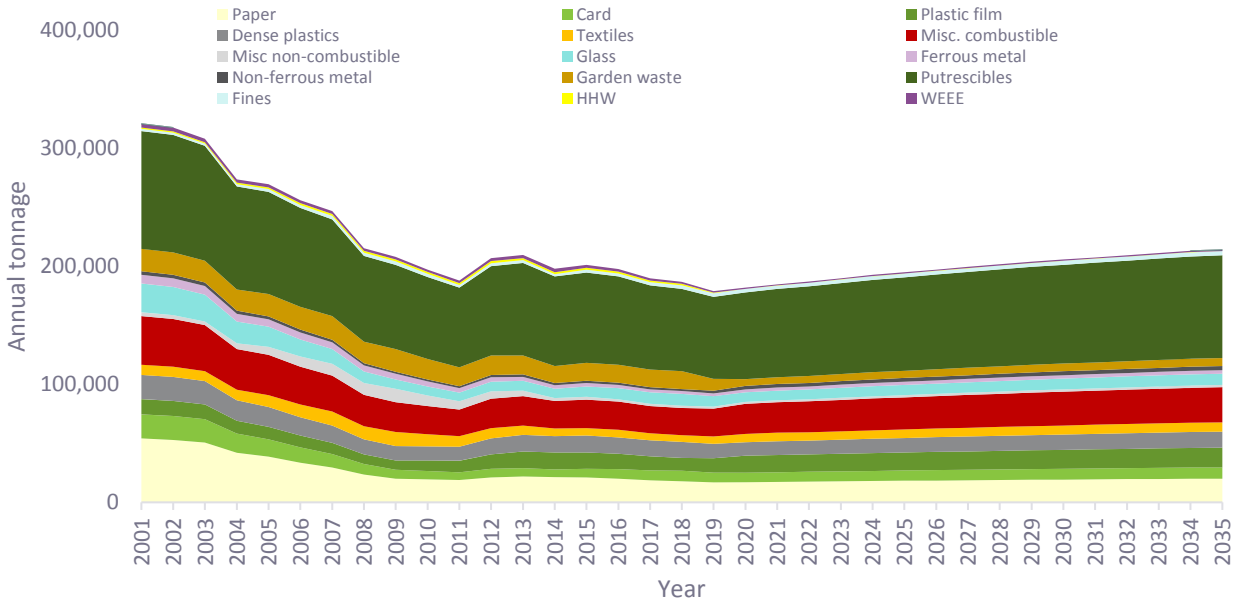
6.3.28 Figure 6.23 disaggregates the total collected residual waste stream into its component categories. This illustrates the historical and projected variation in material tonnage collected by the authority using this option.

Figure 6.23 Option 4 - Total collected household residual waste composition



6.3.29 Figure 6.24 disaggregates the Kerbside collected residual waste stream into its component categories. This illustrates the historical and projected variation in material tonnage collected by the authority using this option.

Figure 6.24 Option 4 - Kerbside collected residual waste composition



Option 5 Reduction of packaging waste (DRS assessment)

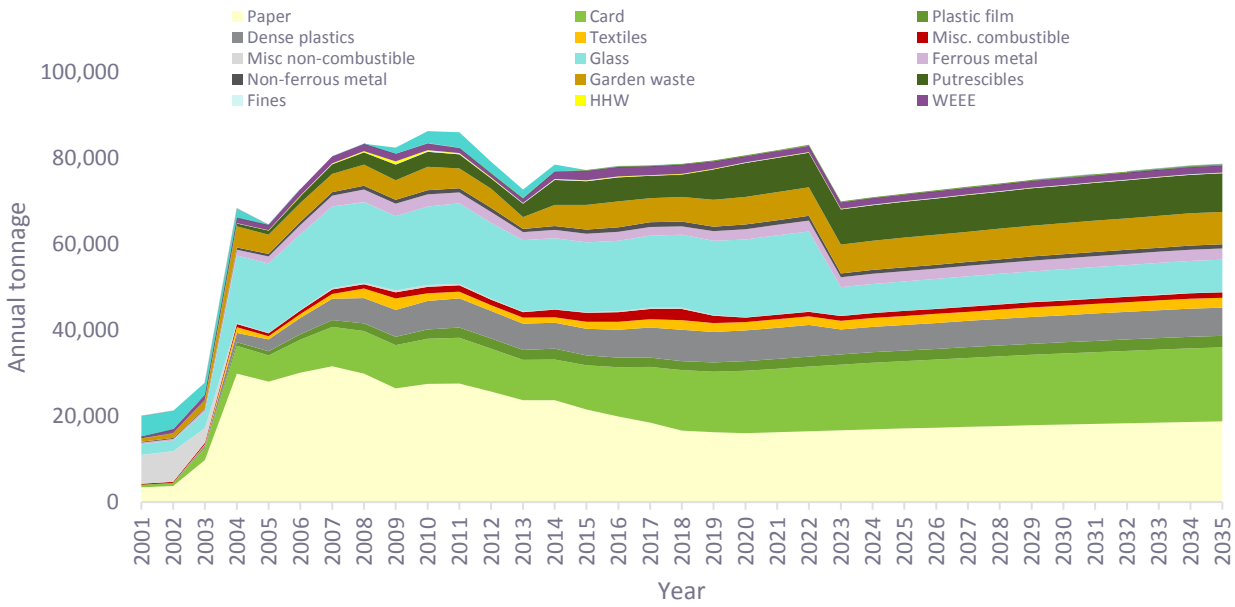
6.3.30 The assumptions behind option 5, as referred to in table 6.8, are as follows:

- DRS 'all-in' option in 2023 and that 85% of the following materials are transferred from kerbside recycling and refuse waste collections to DRS recycling collections: PET drinks bottles, steel and aluminium drink cans and glass drinks bottles

- The remaining 15% goes to kerbside.

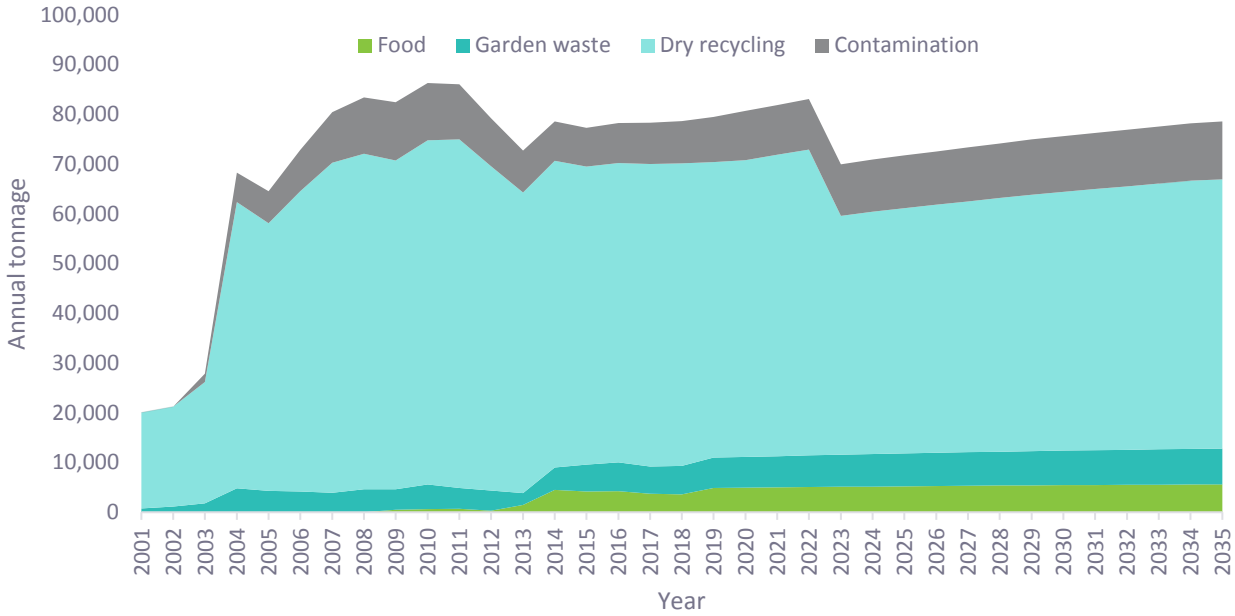
6.3.31 Figure 6.25 disaggregates the collected household recycling into its component categories. This illustrates the historical and projected variation in material tonnage collected by the authority using this option.

Figure 6.25 Option 5 - Total collected household recycling composition



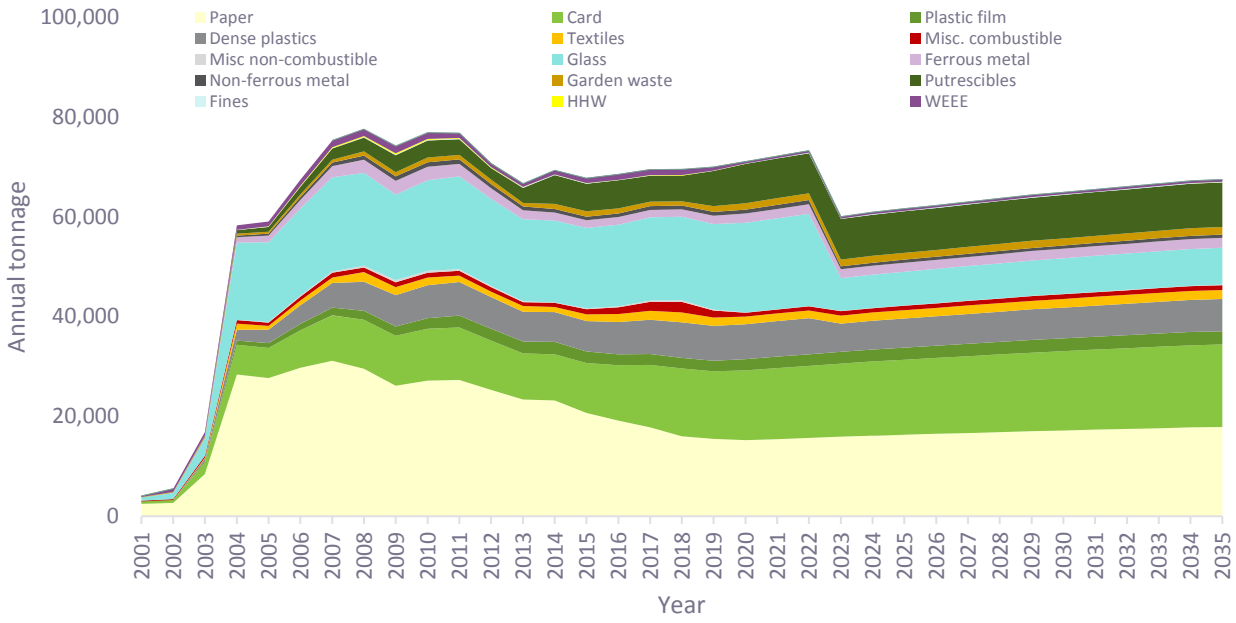
6.3.32 Figure 6.26 disaggregates the net household recycling into four major categories; food waste, garden waste, dry recyclable material and contamination – material that cannot be recycled. This illustrates the level of contamination collected within the dry recycling stream. Dry recycling includes all recyclable materials including textiles and WEEE but excludes food and garden waste.

Figure 6.26 Option 5 - High level net household recycling composition



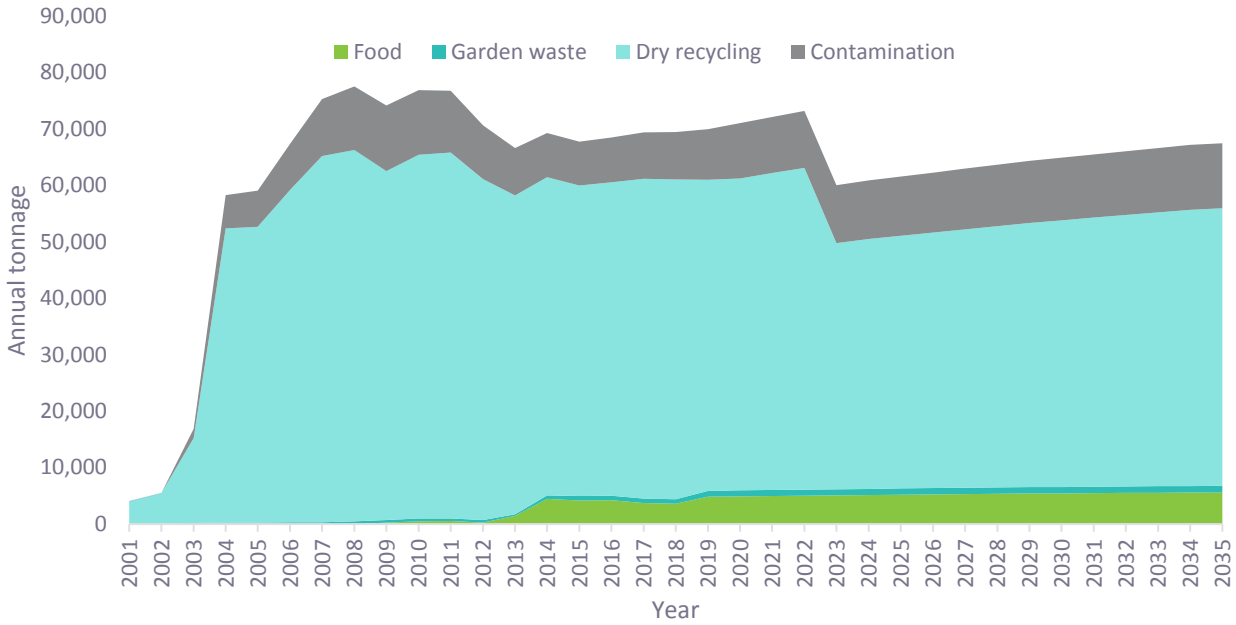
6.3.33 Figure 6.27 disaggregates the net kerbside recycling into its component categories. This illustrates the historical and projected variation in material tonnage collected by the authority using this option.

Figure 6.27 Option 5 - Kerbside collected household recycling composition



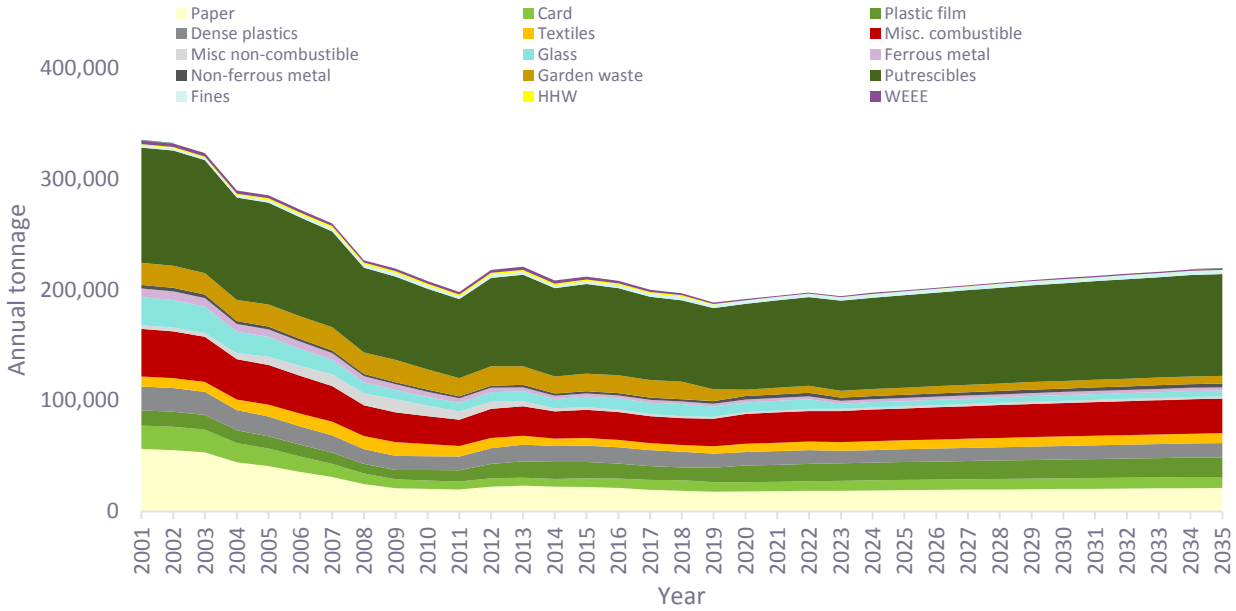
6.3.34 Figure 6.28 disaggregates the net kerbside recycling into four major categories; food waste, garden waste, dry recyclable material and contamination – material that cannot be recycled. This illustrates the level of contamination collected within the dry recycling stream. Dry recycling includes all recyclable materials including textiles and WEEE but excludes food and garden waste.

Figure 6.28 Option 5 - High level net kerbside recycling composition



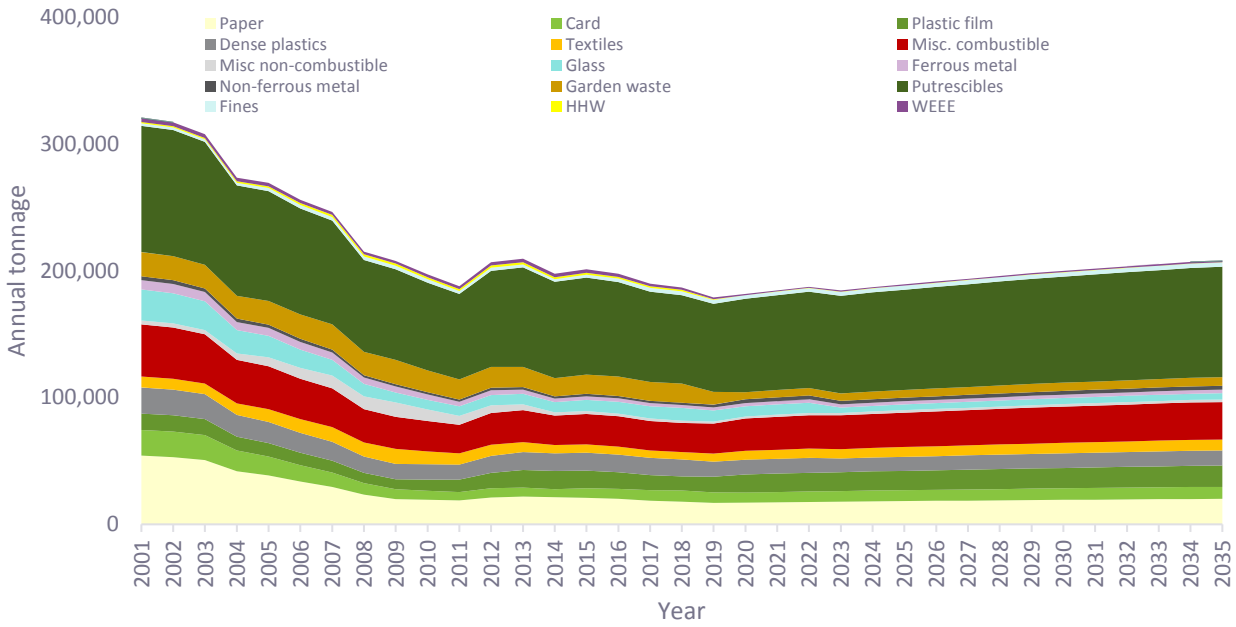
6.3.35 Figure 6.29 disaggregates the total collected residual waste stream into its component categories. This illustrates the historical and projected variation in material tonnage collected by the authority using this option.

Figure 6.29 Option 5 - Total collected household residual waste composition



6.3.36 Figure 6.30 disaggregates the Kerbside collected residual waste stream into its component categories. This illustrates the historical and projected variation in material tonnage collected by the authority using this option.

Figure 6.30 Option 5 - Kerbside collected residual waste composition



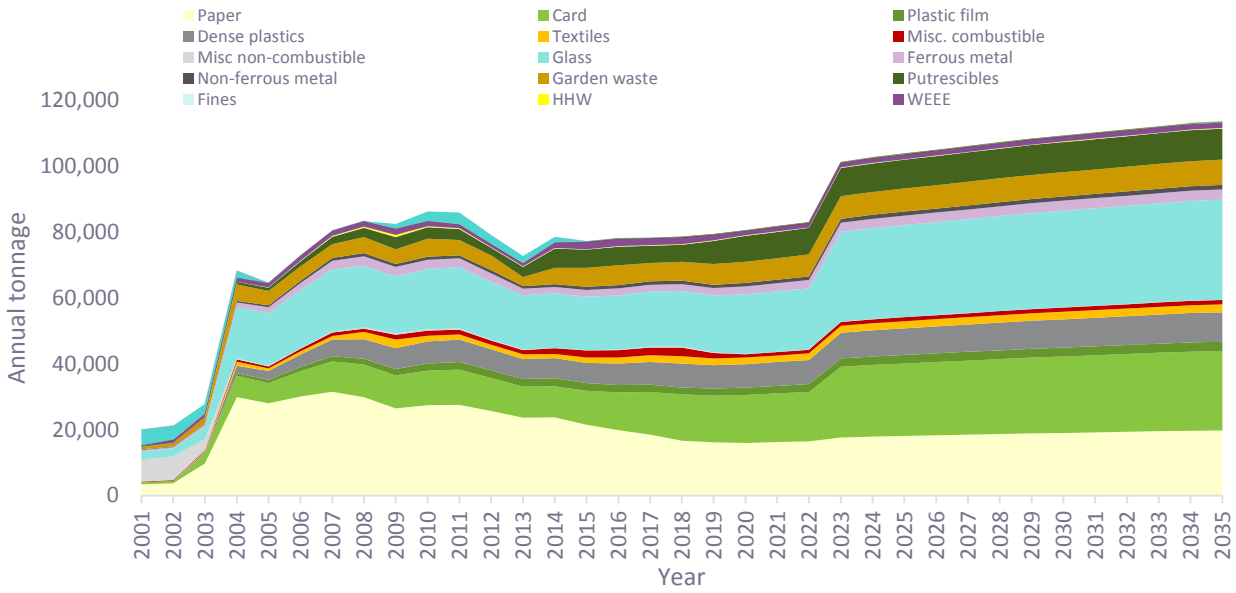
Option 7 Alternate weekly collections (AWC)

6.3.37 The assumptions behind option 7, as referred to in table 6.8, are as follows:

- Applicable to kerbside properties only
- Evidence from WRAP on reducing frequency of collections (+11% in dry recycling capture compared from moving residual waste to fortnightly from weekly).

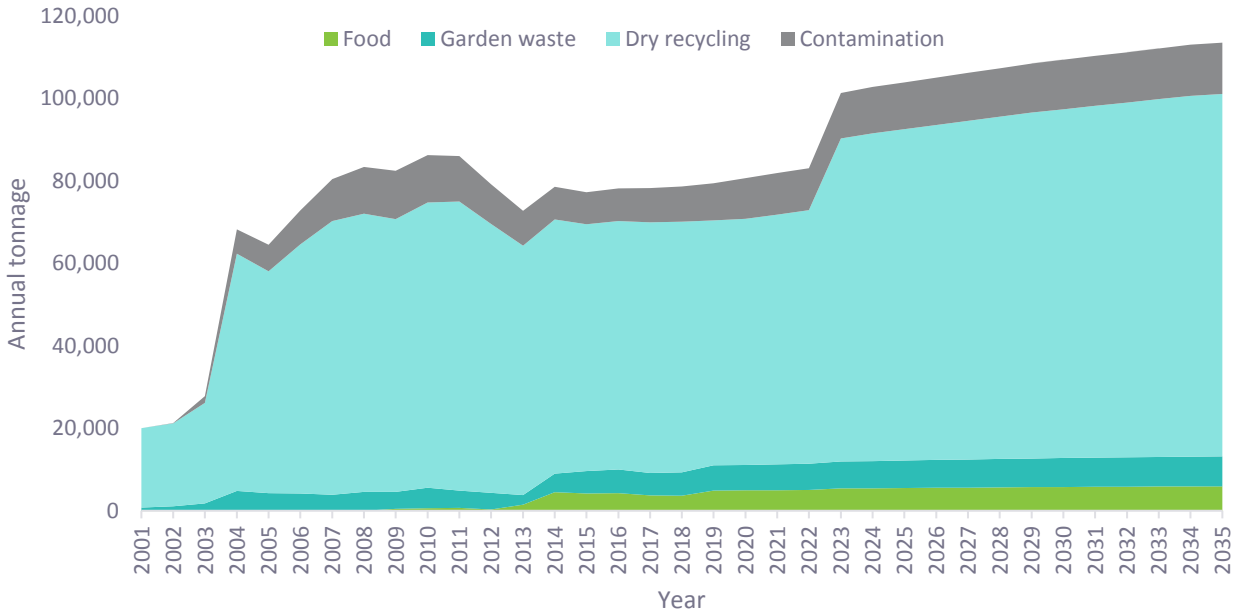
6.3.38 Figure 6.31 disaggregates the collected household recycling into its component categories. This illustrates the historical and projected variation in material tonnage collected by the authority using this option.

Figure 6.31 Option 7 - Total collected household recycling composition



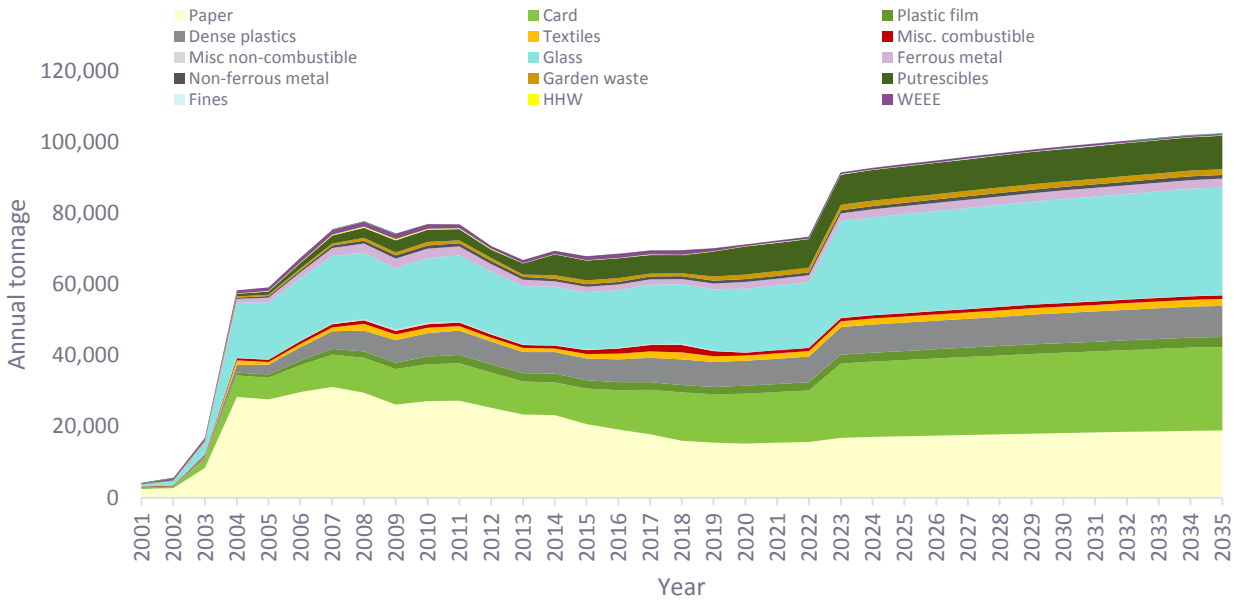
6.3.39 Figure 6.32 disaggregates the net household recycling into four major categories; food waste, garden waste, dry recyclable material and contamination – material that cannot be recycled. This illustrates the level of contamination collected within the dry recycling stream. Dry recycling includes all recyclable materials including textiles and WEEE but excludes food and garden waste.

Figure 6.32 Option 7 - High level net household recycling composition



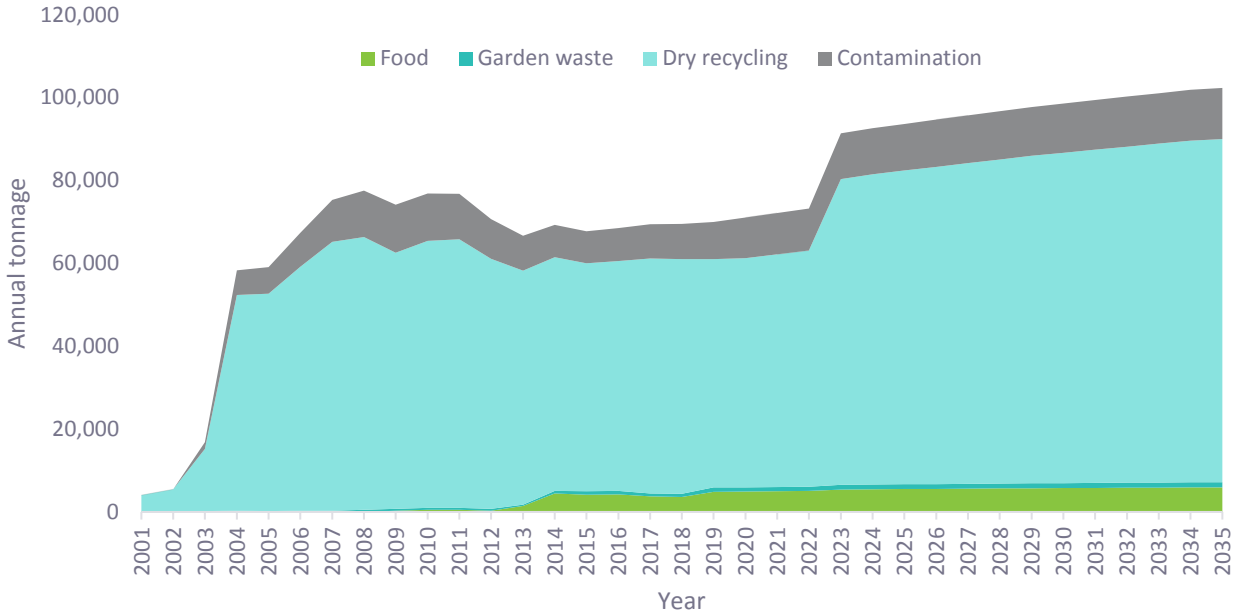
6.3.40 Figure 6.33 disaggregates the net kerbside recycling into its component categories. This illustrates the historical and projected variation in material tonnage collected by the authority using this option.

Figure 6.33 Option 7 - Kerbside collected household recycling composition



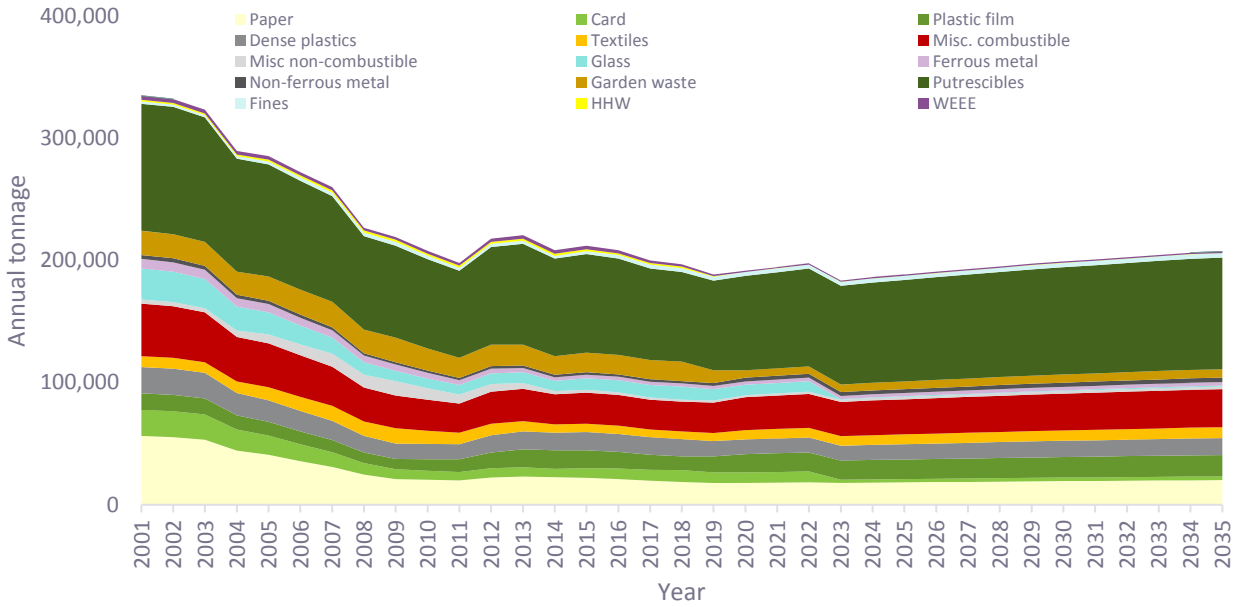
6.3.41 Figure 6.34 disaggregates the net kerbside recycling into four major categories; food waste, garden waste, dry recyclable material and contamination – material that cannot be recycled. This illustrates the level of contamination collected within the dry recycling stream. Dry recycling includes all recyclable materials including textiles and WEEE but excludes food and garden waste.

Figure 6.34 Option 7 - High level net kerbside recycling composition



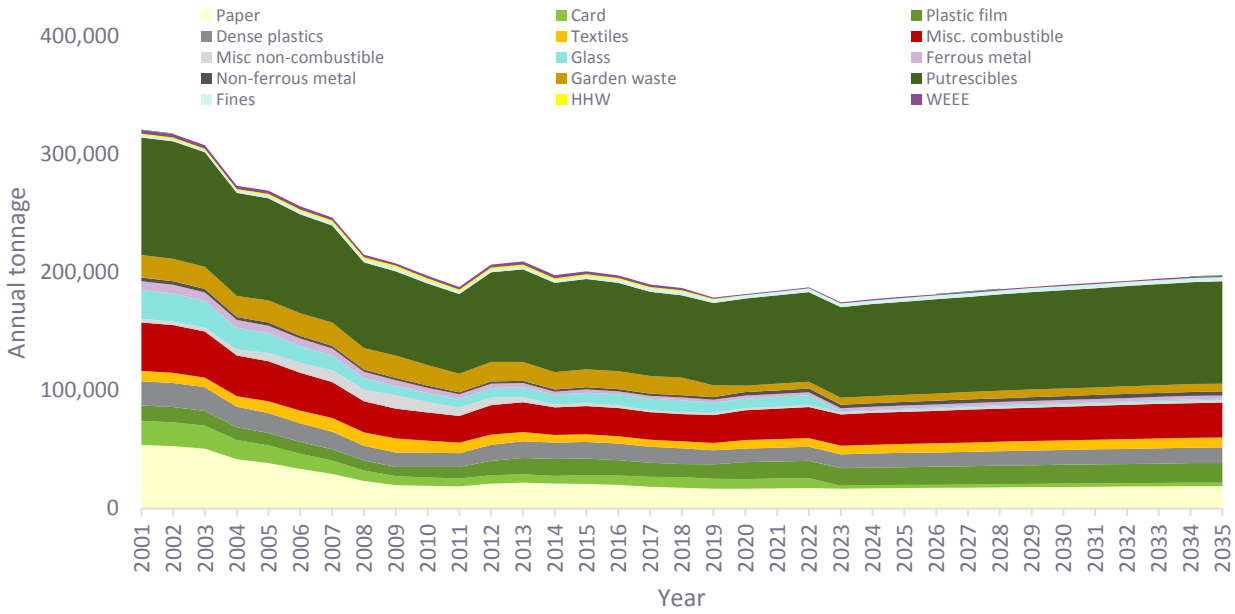
6.3.42 Figure 6.35 disaggregates the total collected residual waste stream into its component categories. This illustrates the historical and projected variation in material tonnage collected by the authority using this option.

Figure 6.35 Option 7 - Total collected household residual waste composition



6.3.43 Figure 6.36 disaggregates the Kerbside collected residual waste stream into its component categories. This illustrates the historical and projected variation in material tonnage collected by the authority using this option.

Figure 6.36 Option 7 - Kerbside collected residual waste composition



Option 8 Separate Garden Waste Collection

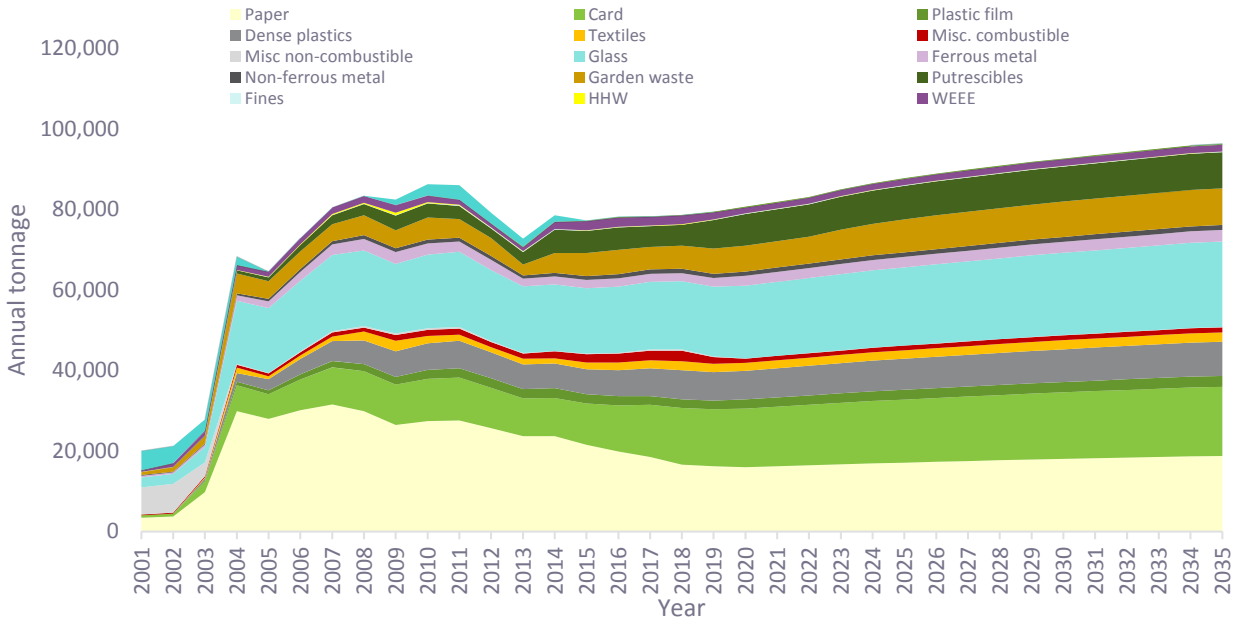
6.3.44 The assumptions behind option 8, as referred to in table 6.8, are as follows:

- Applicable to kerbside properties only
- Lambeth participation/ service take-up rate of 6% of the street level properties

- Projected kerbside yield of 95.6 kg/hh/yr per household participating
- Maximum level of participation level reached in year 3/4 from the introduction of the service.

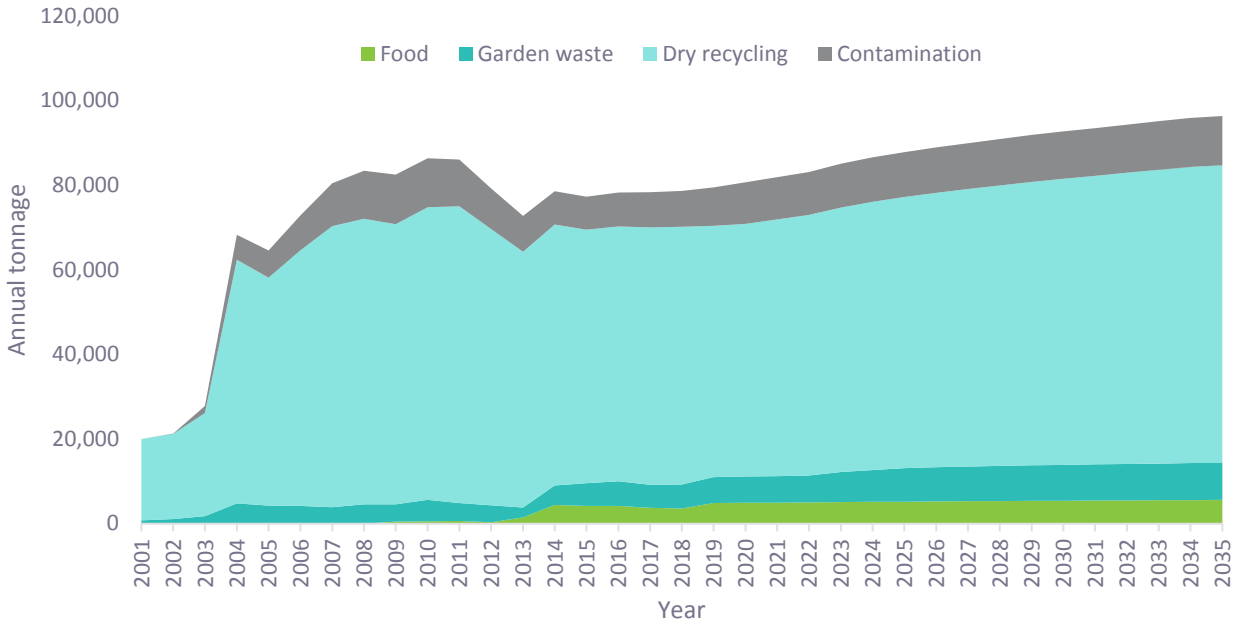
6.3.45 Figure 6.37 disaggregates the collected household recycling into its component categories. This illustrates the historical and projected variation in material tonnage collected by the authority using this option.

Figure 6.37 Option 8 - Total collected household recycling composition



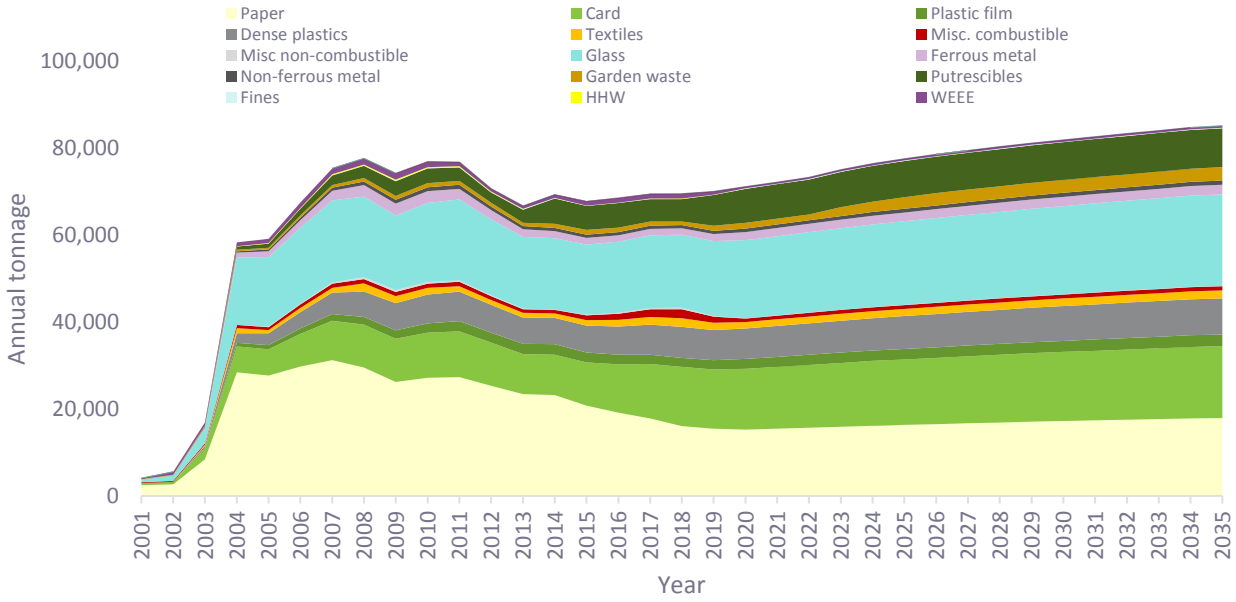
6.3.46 Figure 6.38 disaggregates the net household recycling into four major categories; food waste, garden waste, dry recyclable material and contamination – material that cannot be recycled. This illustrates the level of contamination collected within the dry recycling stream. Dry recycling includes all recyclable materials including textiles and WEEE but excludes food and garden waste.

Figure 6.38 Option 8 - High level net household recycling composition



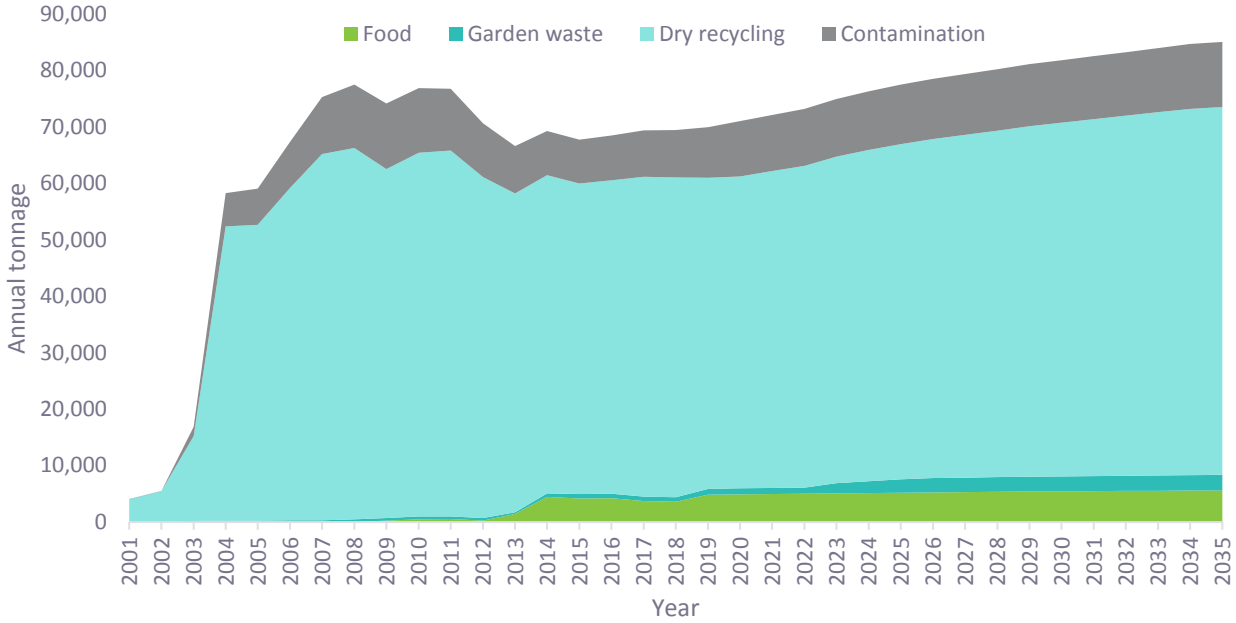
6.3.47 Figure 6.39 disaggregates the net kerbside recycling into its component categories. This illustrates the historical and projected variation in material tonnage collected by the authority using this option.

Figure 6.39 Option 8 - Kerbside collected household recycling composition



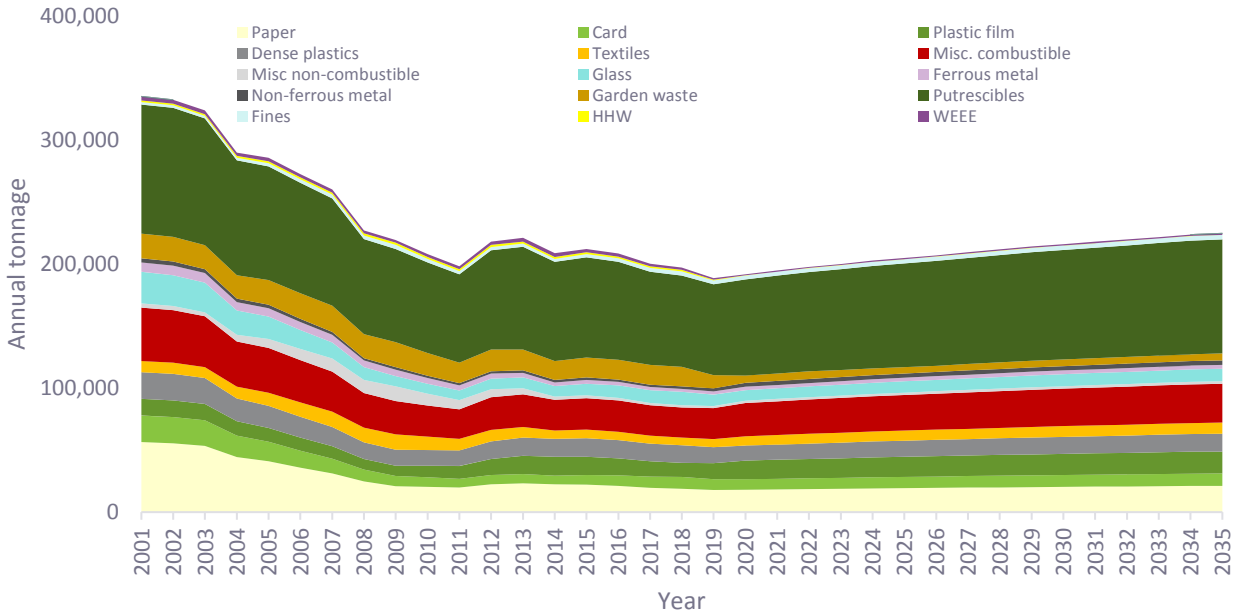
6.3.48 Figure 6.40 disaggregates the net kerbside recycling into four major categories; food waste, garden waste, dry recyclable material and contamination – material that cannot be recycled. This illustrates the level of contamination collected within the dry recycling stream. Dry recycling includes all recyclable materials including textiles and WEEE but excludes food and garden waste.

Figure 6.40 Option 8 - High level net kerbside recycling composition



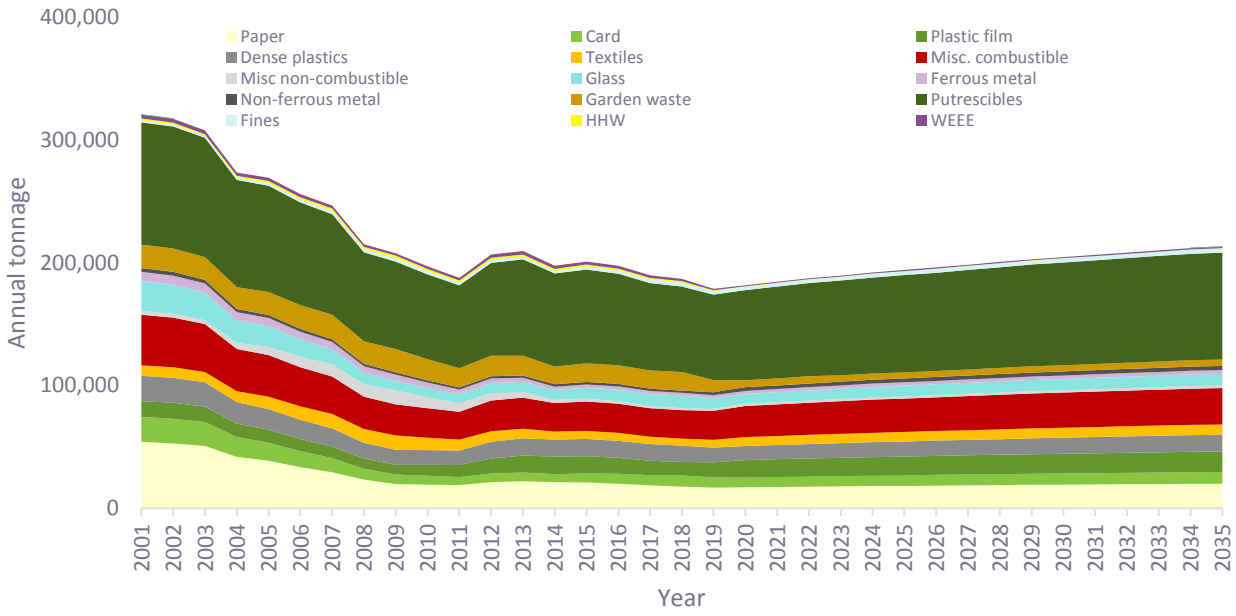
6.3.49 Figure 6.41 disaggregates the total collected residual waste stream into its component categories. This illustrates the historical and projected variation in material tonnage collected by the authority using this option.

Figure 6.41 Option 8 - Total collected household residual waste composition



6.3.50 Figure 6.42 disaggregates the Kerbside collected residual waste stream into its component categories. This illustrates the historical and projected variation in material tonnage collected by the authority using this option.

Figure 6.42 Option 8 - Kerbside collected residual waste composition



6.4 Cost and carbon modelling outputs

6.4.1 Following completion of options modelling and the provision of all operational and cost data for each of the constituent councils, Wood will complete the resource and cost modelling assessment. The cost model will utilise key service information to produce a strategic cost assessment of the options.

6.4.2 Wood will also assess the carbon impact of the modelled options to illustrate potential future emissions of the Authority's and its constituent councils' waste management activities. WRATE will be used to assess the carbon impact (and air quality) of the modelled options.

7. Next steps

7.1.1 The next stage of the project will include:

- Resource and cost assessment
- Carbon impact modelling
- Air quality impact modelling
- Quantitative assessment to identify preferred option
- SMART carbon target setting
- Development of carbon management plans

7.2 Carbon modelling

7.2.1 A comprehensive assessment using WRATE will be used for the bulk of the options, covering off more emission data with a greater level of control and output. It was agreed with the Council that the carbon impact will be focussed on the treatment/processing end, e.g. carbon impact of processing the waste. As the Greater London Authority (GLA) Emissions Performance Standard (EPS) model reflects the approach used for reporting waste impacts in London, it has been agreed with WRWA to model a 'preferred option' using the EPS for each Borough to give the carbon output in the format required.

7.2.2 A quantitative assessment will also consider the increase in the performance of the service against the impact on cost and carbon emissions to allow the Authority to make an assessment of the "Best" option for the future management of the Authority's wastes.

Target setting

7.2.3 Following identification of how the Authority may reduce its carbon impact we will recommend SMART carbon targets for the preferred option for each of the Boroughs, and the identification of plans for how these might be achieved so as to lessen the carbon impact of waste management in the future. The SMART targets will cover performance, carbon and cost, which the authority can easily monitor. These will be:

- Specific – the targets will relate to individual elements of the waste management activities where the Authority can focus efforts
- Measurable – the targets will be quantifiable and easy to measure and monitor over a time period
- Achievable – the targets will be appropriate to the time, resources and budget available to the Authority to meet the targets
- Realistic – the targets will be within the Authority's control to influence, bearing in mind the challenging targets set, e.g. by the Mayor of London.
- Timely – the targets will be time based and each target will have a unique timeframe under which it is likely to be achieved

Carbon management and strategy

7.2.4 Where carbon targets are identified we will develop SMART targets to define the strategic approach required, and these will be formulated into carbon management plans. These plans will allow the Authority to work towards the goals with clear guidance as to the input that will be required to implement the initiatives and achieve the targets. They will cover:

- steps of action;
- the resources required;
- the stakeholders that may need to be involved;
- progress monitoring;
- data recording and reporting.

