Kent Waste Needs Assessment 2022 Update

Capacity Requirement for the Management of Residual Non-Hazardous Waste in Kent

Report: Post Client Review

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Abbreviations

EA	Environment Agency
EfW	Energy from Waste
JMWMS	Joint Municipal Waste Management Strategy
LACW	Local Authority Collected Waste
MSW	Municipal Solid Waste
WNA	Waste Needs Assessment
WPA	Waste Planning Authority

Glossary of Terms

Commercial Waste	Waste arising from premises which are used wholly or mainly for trade, business, sport, recreation or entertainment, excluding municipal and industrial waste.
Construction, Demolition & Excavation Waste	Waste arising from the building process comprising demolition and site clearance waste and builders' waste from the construction/demolition of buildings and infrastructure. Includes masonry, rubble and timber.
Energy from Waste	The conversion of the calorific value of waste into energy, normally heat or electricity through applying thermal treatment of some sort.
Environment Agency	The body responsible for the regulation of waste management activities through issuing permits to control activities that handle or produce waste. It also provides up-to-date information on waste management matters and deals with other matters such as water issues including flood protection.
Industrial Waste	Waste arising from any factory and from any premises occupied by an industry (excluding mines and quarries).
Landfill (including land raising)	The permanent disposal of waste to land, by the filling of voids or similar features, or the construction of landforms above ground level (land-raising).
Local Authority Collected Waste	All waste collected by a local authority. Includes household waste and business waste where collected by a local authority. LACW is the definition used in statistical publications, which previously referred to municipal waste.
Municipal Solid Waste (MSW)	Term used to capture LACW plus waste that has a similar composition arising from businesses.
Other Recovery	Processes that recover value from waste such as thermal treatment to recover energy. Lower than recycling or composting on the waste hierarchy.
Recovery	Term to cover any process that recovers value from waste including recycling, composting or thermal treatment to recover energy.
Recycling	The reprocessing of materials extracted from the waste stream either into the same product or a different one.
Residual Waste	Waste remaining after materials for re-use, recycling and composting/organic waste treatment e.g. anaerobic digestion have been removed.

1. Introduction

1.1. Purpose

This report updates the estimate of the future capacity requirement for Energy from Waste (EfW) (referred to as 'Other Recovery') set out in the report, '*Capacity Requirement for the Management of Residual Non Hazardous Waste'* (BPP Consulting September 2018) that informed the Early Partial review of the KMWLP. It principally uses the outputs of the updated forecasts of waste arising as set out in other sections of the WNA 2022 Update. This estimate takes account of the following:

- The Kent Minerals and Waste Local Plan (KMWLP) objective of achieving net self-sufficiency in the management of residual non-hazardous waste for Kent;
- the updated capacity requirements calculated for Local Authority Collected Waste (LACW), Commercial and Industrial (C&I) and Construction, Demolition and Excavation (C, D & E) waste and for waste that may be imported from, or is currently exported to, London and related updated forecasts of waste arising as set out in other sections of the 2022 updated Waste Needs Assessment (WNA); and,
- remaining consented non-hazardous waste landfill capacity.

1.2. Definitions

For the avoidance of doubt, definitions of the key terms used in this report are set out below.

Residual non-hazardous waste

Residual non-hazardous waste is the portion of waste left over after elements have been extracted for recycling/composting. In this report the term refers to such waste that arises in the Kent LACW, C&I and C, D & E waste streams, as these are the principal sources of non-hazardous residual waste.

'Other Recovery'

The Waste Framework Directive classes any waste operation that isn't disposal, as 'recovery'. Recovery therefore includes recycling, composting and energy recovery. Recovery is further refined in the waste hierarchy which applies levels of preference between certain recovery activities, placing recycling and composting above energy recovery. Since recycling and composting fall within the overall class of recovery, and this report addresses the management needs of waste that remains once recycling and composting has been prioritised, the term 'Other Recovery' has been used to cover those operations that fall within the recovery class other than recycling or composting. For residual non-hazardous waste, 'Other Recovery' normally means thermal treatment with energy recovery i.e. EfW. Thermal treatment without energy recovery above a certain efficiency ranks alongside landfill as disposal, and sits at the bottom of the waste hierarchy.

1.3. Context

The report, *'Capacity Requirement for the Management of Residual Non-Hazardous Waste'* (BPP Consulting September 2018) that informed the Early Partial review of the KMWLP concluded the following:

> *"The assessment shows that the combined consented EfW capacity and remaining consented non-hazardous landfill capacity together is likely to be more than sufficient to meet the revised projected Plan needs for the management of residual non-hazardous waste to the end of the Plan period. Therefore, net self-sufficiency in residual waste management capacity may be achieved in Kent without provision for additional Other Recovery capacity other than that which has already been consented. The predicted remaining non-hazardous waste landfill void confers flexibility in the event of unforeseen changes in residual waste management requirements."*

This conclusion underpinned the revision of Policies CSW 7 and CSW 8 of KWMLP 2020 (which plans for the period to 2030), and meant that specific allocations of land for waste management, intended to help ensure any capacity shortfalls would be met, were no longer necessary.

2. Updated Forecasts of Residual Non-hazardous Waste

2.1. Residual Waste from LACW Stream

The management targets for LACW over the current Plan period that underpinned the adopted KMWLP following its Early Partial Review are as set out in Table 1 below:

Table 1: LACW Management Targets underpinning KMWLP EPR 2020

	Milestone Year		
	2020/21	**2025/26**	**2030/31**
Recycling/composting (floor)	50%	55%	60%
Remainder to Landfill (ceiling)	2%	2%	2%
Other Recovery (remainder)	48%	43%	38%

The proposed updates to the KMWLP include extending the plan period to 2038 and, as a result, additional revised Plan targets are proposed to cover this period. Since adoption of the amended Kent MWLP in 2020, further developments in waste and resource policy have occurred. This includes the intention to adopt a target to reduce the quantity of residual waste produced, and hence requiring management, by 50% by 2042. Achieving this target requires a recycling rate of over 70% to be achieved across the waste streams by 2042. This has been taken into account in the additional targets for 2035/36 and 2040/41 as set out in Table 2:

Table 2: LACW Management Targets Proposed in updated KMWLP 2022

	Actual	Milestone Year				
	2020	**2021/21**	**2025/26**	**2030/31**	**2035/36**	**2040/41**
Recycling/composting (floor)	*50%*	50%	55%	60%	65%	70%
Landfill (ceiling)	*2%*	2%	2%	2%	2%	2%
Remainder to Other Recovery	*45%*	48%	43%	38%	33%	28%

Applying these targets to the forecast arisings of Kent LACW[1] gives the requirement in Table 3.

Table 3: Proposed Updated Targets applied to projected LACW Arisings in Kent (tonnes per annum)
rounded

Line		Actual	Milestone Year				
		2020	**2020/21**	**2025/26**	**2030/31**	**2035/36**	**2040/41**
1	**Recycling/composting floor**	*298,702*	362,500	377,000	416,000	455,000	495,000
2	**Landfill ceiling**	*14,551*	14,500	14,000	14,000	14,000	14,000
3	**Remainder to Other Recovery (tpa)**	*365,640*	348,000	295,000	263,000	232,000	198,000

[1] Updated Management Requirement for Local Authority Collected Waste in Kent 2020 BPP Consulting October 2022

2.2. Residual Waste from Kent C&I Waste Stream

The management targets for Kent C&I waste over the current Plan period underpinning the adopted KMWLP are as set out in Table 4 below:

Table 4: C&I Waste Management Targets underpinning KMWLP EPR 2020

	Milestone Year		
	2020/21	**2025/26**	**2030/31**
Recycling/composting (floor)	50%	55%	60%
Remainder to Landfill (ceiling)	15%	12.5%	10%
Other Recovery (remainder)	35%	32.5%	30%

The Government's intention to adopt a target to reduce the quantity of residual waste produced and hence requiring management by 50% by 2042 is expected to require recycling of this stream to be substantially increased. This is likely to be achieved by imposition of a requirement for source segregation of recyclable materials and food waste by businesses. In addition, larger businesses are also already taking their own voluntary initiatives to reduce waste such as zero waste to landfill. Taking this into account, additional Plan targets for 2035/36 and 2040/41 have been derived for inclusion in the updated Plan as set out in Table 5:

Table 5: C&I Waste Management Targets Proposed in updated KMWLP 2022

	Actual	Milestone Year				
	2020	**2020/21**	**2025/26**	**2030/31**	**2035/36**	**2040/41**
Recycling/composting floor	*64%*	50%	55%	60%	65%	70%
Landfill ceiling	*22%*	15%	12.5%	10%	8.5%	5%
Remainder to Other Recovery	*14%*	35%	32.5%	30%	26.5%	25%

Applying these to the forecast arisings gives the capacity requirement in Table 6.

Table 6: Proposed Updated Targets applied to total C&I Waste Arising in Kent (tonnes per annum)
rounded

Line		Actual	Milestone Year				
		2020	**2020/21**	**2025/26**	**2030/31**	**2035/36**	**2040/41**
1	**Recycling/composting floor**	*691,304*	637,000	628,000	720,000	820,000	928,500
2	**Landfill ceiling**	*241,128*	191,000	143,000	120,000[2]	107,500	66,500
3	**Remainder to Other Recovery (tpa)**	*149,245*	446,000	371,000	360,000	335,500	332,000

[2] This value includes c135,000 tonnes of process residues arising from the DS Smith Paper mill at Kemsley. The operator of this plant has a commitment to 'zero waste to landfill' by 2030 so is adopting initiatives to reduce the tonnage produced and divert that which will continue to be produced from landfill. Therefore, it is considered that it is realistic to forecast a drop of over 100,000 tonnes going to landfill by 3030/31.

2.3. Residual Waste from C, D & E Waste Stream

The management targets for the non-inert fraction of C, D & E waste arising in Kent over the current Plan period underpinning the adopted KMWLP are as set out in Table 7 below. This is on the basis that the non-inert content accounts for 20% of total C, D & E waste arisings. For the purpose of this exercise it is assumed that the non-inert element of C, D & E waste represents the residual waste targeted in this report.

Table 7: C, D & E Waste Management Targets underpinning KMWLP EPR 2020 (non-inert only)

	Milestone Year		
	2020/21	**2025/26**	**2030/31**
Recycling Floor	12%	13%	14%
Composting Floor	1%	1%	1%
Other Recovery Ceiling	5%	5%	5%
Remainder to Landfill Ceiling	2%	1%	0.5%

The additional Plan targets for 2035/36 and 2040/41 proposed for inclusion in the updated Plan are expressed as % of non-inert waste arising of the Kent C, D & E waste stream. These targets equate to those shown in Table 8 on the basis that the non-inert content of C, D & E waste will account for 20% of total C, D & E waste arisings throughout the Plan period.

Table 8: Kent MWLP Proposed Non-inert C, D & E Waste Targets expressed as % of total arising

	Actual	Milestone Year				
Management Route	**2020**	**2020/21**	**2025/26**	**2030/31**	**2035/36**	**2040/41**
Recycling Floor	*12%*	12%	13%	14%	15%	16%
Composting Floor	-	1%	1%	1%	n/a	n/a
Other Recovery Ceiling	*5%*	5%	5%	5%	4.9%	4%
Remainder to Landfill Ceiling	*2%*	2%	1%	0.5%	0.1%	0%

Given the *Kent C, D & E Waste Management Needs Update* report concluded a zero-growth rate remains justified, the above proposed targets are applied to the updated baseline value for 2020 to arrive at the management requirements displayed in Table 9 below.

Table 9: Proposed Updated Targets applied to total C, D & E Waste Arisings in Kent (tonnes per annum) *rounded*

Line	Management Route	Actual	Milestone Year				
		2020	2020/21	2025/26	2030/31	2035/36	2040/41
1	Recycling	*364,851*	302,000	326,500	351,500	376,500[3]	402,000
2	Composting	*Unknown*	25,000	25,000	25,000		
3	Other Recovery	*28,781*	126,000	125,500	125,500	123,000	100,500
4	Non-inert Landfill	*74,657*	50,500	25,000	14,000	3,000	0

In addition, consideration of whether London's residual waste, as detailed in WNA 2022 Report entitled *Review of Waste Flows Between London & Kent*, should be factored into this assessment. Analysis in this report has shown that no express provision for additional capacity need be made for non-hazardous waste from London.

Furthermore, the report also concluded that the additional provision of the non-hazardous residual waste from Kent managed at Rainham landfill in London due to its expected closure in the Plan period no longer needs to be planned for on the basis that the principal wastes[4] managed there are already accounted for in the assessment of capacity needs for the C&I and C, D & E waste streams.

[3] Separation for recycling and composting considered together, given there is no EWC for green waste under Chapter 17 so it is impossible to distinguish the quantity of the total amount of green waste coded under Chapter 20 that might have arisen from C, D & E waste stream

[4] Soils and stones, screenings and wastes from waste processing

3. Future Residual Non-hazardous Waste Management Needs for Kent

To calculate the overall residual waste management capacity requirement for Kent, the values from lines 2, 3 and 4 of Tables 3, 6 and 10 above are combined in Table 10 below.

Table 10: Projected Tonnages of Kent Residual Waste Arisings Requiring Management (tonnes) *rounded*

	Actual	Milestone Year				
	2020	**2020/21**	**2025/26**	**2030/31**	**2035/36**	**2040/41**
Remainder to Landfill (ceiling)	*330,336*	256,000	181,500	148,000	124,000	80,000
Other Recovery (remainder)	*543,666*	920,000	791,000	749,000	688,000	630,000
Total		1,175,777	972,500	897,000	812,500	710,500

Table 10 above indicates that the maximum annual quantity of residual waste requiring 'other recovery' over the period 2025 to 2040 is predicted to be c791,000 tonnes at 2025 reducing to c630,000 tonnes at the end of the Plan period. The total cumulative landfill requirement over this period is predicted to be c2.15M tonnes (or 2.15M cubic metres in line with the assumption of a placed density of 1 tonne per cubic metre i.e. 1 tonne of residual non-hazardous waste would occupy 1 cubic metre of voidspace).

4. Existing Capacity for Management of Residual Non-Hazardous Waste by Other Recovery

Allington Energy from Waste plant

The Energy from Waste (EfW) plant at Allington has capacity to process up to 500,000 tonnes of waste per annum (tpa). KCC as Waste Disposal Authority (WDA) has a contract to supply up to 374,000 tpa of LACW to this facility until 2030 so it may be assumed that the remaining capacity i.e. 126,000 tonnes will be available for the management of residual non-hazardous waste from the Commercial and Industrial (C&I) waste stream. If the spare capacity is utilised by waste from beyond Kent then, when applying the principle of net self-sufficiency, it is acceptable to plan on the basis that an equivalent tonnage of waste from Kent may be managed outside the Plan Area.

Kemsley Sustainable Energy Plant (SEP)aka K3

Waste managed at the Kemsley Sustainable Energy Plant (SEP) comprises non-hazardous residual waste from municipal and C&I sources and may include up to 25,000 tpa of waste plastics arising from the adjoining paper making process although currently it is understood to only take c8,000tpa of waste from the papermill site. Following the grant of a Development Order Consent in 2020, the site provides 'other recovery' capacity of around 657,000 tonnes per annum of residual non-hazardous waste.

5. Assessing the 'Other Recovery' Capacity Requirement for Kent's Residual Non-Hazardous Waste

The requirement for any additional 'Other Recovery' capacity can be calculated by comparing the 'Other Recovery' requirement (set out in Table 10 above) against the existing consented capacity for EfW to manage residual waste summarised in the previous section. This comparison is set out in Table 11 below.

Table 11: Projected 'Other Recovery' Capacity Gap for Kent Non Haz Residual Waste Arisings (tpa)

Line		Milestone Year			
		2025/26	**2030/31**	**2035/36**	**2040/41**
1	*Allington EfW capacity*	*500,000*	*500,000*	*500,000*	*500,000*
2	*Kemsley SEP capacity at 2019*	*657,000*	*657,000*	*657,000*	*657,000*
3	Total (Line 1+2)	1,157,000	1,157,000	1,157,000	1,157,000
4	Other Recovery Requirement (Line 2 Table 10)	791,000	749,000	688,000	630,000
5	**'Other Recovery' Capacity Requirement (Line 3 minus Line 4)**	**0 (366,000 surplus)**	**0 (408,000 surplus)**	**0 (469,500 surplus)**	**0 (527,000 surplus)**
6	**Tonnage projected as going to landfill (Line 1 Table 10)**	181,500	148,000	124,000	80,000
7	**Non-haz residual waste capacity gap (Line 5 minus Line 6)**	0 (184,500 surplus)	0 (260,000 surplus)	0 (345,000 surplus)	0 (447,000 surplus)

This indicates that there is no predicted shortfall in 'other recovery' capacity and the capacity surplus is sufficient to absorb the predicted non-hazardous residual waste landfill requirement. This also shows that Kent would remain net self-sufficient in non-hazardous residual waste management capacity throughout the Plan period.

6. Assessing Kent's Need for Non-hazardous Waste Landfill

As shown in the section above, given the 'surplus' of EfW capacity in Kent, net self-sufficiency in non-hazardous residual waste will be achieved for the whole Plan period. However, it is acknowledged that not all wastes produced in Kent may be suitable for management by EfW and so consideration has been given to the possible need for non-hazardous landfill capacity within the county.

6.1. Kent Non-Hazardous Waste Landfill Capacity

Environment Agency data[5] shows that at the end of 2020 there was 1,792,500 cubic metres of void remaining at the sole remaining landfill in Kent (Shelford Landfill) consented to accept non-hazardous waste for disposal. Given Kemsley Paper Mill accounts for 50% (100,000 tonnes) of Kent non-hazardous residual waste sent to landfill in 2020 and its commitment to send zero waste to landfill by 2030, the projected management capacity required for non-hazardous residual waste to landfill over the Plan period (Table 11) is shown in Table 12 along with the predicted depletion of Plan Area non-hazardous waste landfill capacity.

Table 12: Predicted Depletion of Non-Hazardous Waste Landfill void in Kent (m3)

	Assuming 100,000 Tonnes Inputs from Kemsley Reducing to 0 by 2030	Remaining Non-Hazardous Waste to Landfill	Inert Cover/ Restoration material @15% input	Annual Depletion	Void Remaining
2020					1,792,500
2021	100,000	140,960	36,144	277,104	1,515,396
2022	88,889	132,240	33,169	254,299	1,261,097
2023	77,778	123,521	30,195	231,494	1,029,604
2024	66,667	114,802	27,220	208,688	820,915
2025	55,556	106,082	24,246	185,883	635,032
2026	44,444	102,159	21,991	168,594	466,438
2027	33,333	98,236	19,735	151,305	315,133
2028	22,222	94,313	17,480	134,016	181,117
2029	11,111	90,390	15,225	116,727	64,390
2030	0	86,467	12,970	99,438	-35,047
2031	0	83,706	12,556	96,262	-131,309
2032	0	80,944	12,142	93,086	-224,395
2033	0	78,182	11,727	89,910	-314,304
2034	0	75,421	11,313	86,734	-401,038
2035	0	72,659	10,899	83,558	-484,596
2036	0	67,539	10,131	77,670	-562,266
2037	0	62,419	9,363	71,782	-634,048
2038	0	57,299	8,595	65,894	-699,943

The theoretical non-hazardous landfill shortfall at the end of the Plan period is 0.7 million m3. However, this does not account for the possibility of a greater quantity of Kent non-hazardous

[5] Environment Agency Remaining Landfill Capacity (30 September 2022)

residual waste being managed by means other than landfill than the combined targets project, nor the actual fill rates of non-hazardous waste at Shelford landfill which in recent years stands at c150,000tpa[6] ,significantly less than the predicted requirement in 2021 of c241,000 tonnes.

Therefore a further scenario was tested to seek to minimise out of county landfill demand over the Plan period. This aims to conserve Shelford void so it is available for the management of Kent's non-hazardous waste over the whole Plan period. This found that a maximum tonnage of 185,000 tonnes in 2021 (initially split equally between column 2 Kemsley and column 3 remaining reflecting the fact Kemsley accounted for 50% of non-haz residual inputs in 2020) would result in capacity being conserved as shown in Table 13 below.

Table 13 also shows the tonnage of non-hazardous residual waste that would need to be managed through other means or elsewhere.

Table 13: Predicted Depletion of Non-Hazardous Void in Kent applying average actual fill rates (m3)

	Assuming 50% inputs from Kemsley reducing to 0 by 2030 (diff diverted from landfill)	Remaining non-hazardous waste to landfill applying reduction rate as in Table 12	Inert Cover/ Restoration material @15% input	Annual depletion	Void remaining	Remaining annual tonnage managed through other means or elsewhere	Potential Cumulative Requirement for waste to be managed through other means or elsewhere
2020					1,792,500		
2021	*92,500*	*92,500*	*27,750*	*212,750*	*1,579,750*	*55,960*	*55,960*
2022	82,222	86,778	25,350	194,350	1,385,400	52,498	108,458
2023	71,944	81,056	22,950	175,951	1,209,449	49,037	157,495
2024	61,667	75,335	20,550	157,551	1,051,897	45,575	203,070
2025	51,389	69,613	18,150	139,152	912,745	42,114	245,184
2026	41,111	67,038	16,222	124,372	788,373	40,556	285,740
2027	30,833	64,464	14,295	109,592	678,781	38,999	324,739
2028	20,556	61,890	12,367	94,812	583,969	37,442	362,181
2029	10,278	59,316	10,439	80,032	503,937	35,884	398,065
2030	0	56,741	8,511	65,252	438,684	34,327	432,392
2031	0	54,929	8,239	63,168	375,516	33,230	465,622
2032	0	53,117	7,968	61,084	314,432	32,134	497,756
2033	0	51,304	7,696	59,000	255,431	31,038	528,794
2034	0	49,492	7,424	56,916	198,515	29,941	558,735
2035	0	47,680	7,152	54,832	143,684	28,845	587,580
2036	0	44,320	6,648	50,968	92,715	26,812	614,393
2037	0	40,961	6,144	47,105	45,611	24,780	639,173
2038	0	37,601	5,640	43,241	2,370	22,747	661,920

[6] Based on the average inputs to Shelford Landfill in the WDI over a 4-year period from 2017-2020

6.2. Conclusion

The assessment shows that the combined consented EfW capacity and remaining consented non-hazardous landfill capacity together is likely to be more than sufficient to meet the revised projected KMWLP requirements for the management of residual non-hazardous waste to the end of the revised Plan period. Therefore, net self-sufficiency in residual waste management capacity can be expected to be achieved in Kent without the development of additional capacity.

While the remaining non-hazardous waste landfill void confers some flexibility; should significant amounts of waste prove to be unsuitable for EfW, non-hazardous waste landfill capacity may need to be augmented in the latter part of the Plan period. Plan policy CSW9 provides for this eventuality. However, it is anticipated that the actual depletion rate is likely to be much less than indicated in Table 12, especially bearing in mind the fact that 'other recovery' capacity is readily available within the county that will help expedite the diversion of waste from landfill.