

Waste Regulations Compliance Review

1.0 Introduction

Eunomia Research & Consulting (Eunomia) has prepared this report for City of London Corporation ('the Corporation') to provide a review of the Corporation's preparedness to demonstrate compliance with the Waste England and Wales Regulations 2011 (as amended) ('the Regulations').^{1 2}

Under the Regulations:

- Regulation 12, which came into force in 2011, places an ongoing requirement on authorities to apply the waste hierarchy.
- Regulation 13 states that from 1st January 2015, all waste collectors in England and Wales will be required to collect glass, metal, paper, and plastic ("the four materials") in separate streams where doing so is both necessary and technically, economically and environmentally practicable (TEEP).

Effectively, "necessity" and "practicability" are two tests that, if met, mean that separate collection is required. There is no statutory guidance on how to determine whether separate collection is "necessary" or "practicable". However, WRAP, the London Waste and Recycling Board, and Waste Network Chairs commissioned Eunomia to prepare a "Route-map" to assist authorities in interpreting the law.³ The Environment Agency (EA) has signalled that it will take account of the Route-map as part of its regulatory approach.⁴ The advice in this report is therefore closely based on the approach set out in the Route-map.

1.1 Waste Collections in City of London

Waste collection in the City of London differs greatly from other waste collection authorities. The 6,500 households within the City are located almost entirely in low-rise and high-rise blocks that have very limited storage space for waste containers and utilise communal bins. To overcome these challenges the Corporation's current collection system combines several different collection methods and frequencies:

- Residual:
 - Barbican: daily doorstep collections Monday-Friday using bags and access to communal bins
 - Golden Lane, Mansell Street and Middlesex Street Estates: households receive doorstep collections and have waste chutes to communal bins

¹ UK Government (2011) The Waste (England and Wales) Regulations 2011, 28th March 2011

² UK Government (2014) The Waste (England and Wales) (Amendment) Regulations 2012, 1st October 2012

³ WRAP, and LWARB (2014) *Waste Regulations Route-map*, April 2014

⁴ Environment Agency (2014) *Separate Collection of Recyclables: Briefing Note*, June 2014

- Private blocks with bin store: collections 1-5 times per week from communal bins
- Private blocks without bin store: daily time-banded doorstep collection of sacks (sacks must be set out between 6.30pm and 7.30pm)
- Dry Recycling (accepting paper, card, glass, tetra paks, foil, cans, mixed plastic and plastic bags):
 - Barbican: daily doorstep collection of co-mingled recycling collected Monday-Friday using clear sacks and access to communal bins
 - Golden Lane, Mansell Street and Middlesex Estates: doorstep collections of comingled recycling twice weekly using clear sacks
 - Private blocks with bin store: collections 1-5 times per week from communal bins
 - Private blocks without bin store: Daily time-banded doorstep collection of sacks (sacks must be set out between 6.30pm and 7.30pm)
- Collections of food waste (presented in caddies) are available at all four city estates, at the same time as comingled recycling is collected. Certain private blocks with bin stores have separate weekly food waste collections from communal bins

The Corporation also provides the following waste services:

- household bulky waste and bulky reuse collections;
- bring or communal bin sites, often including facilities for materials such as textiles (Salvation Army charity bins), batteries, light bulbs and small WEEE;
- hazardous waste collections, where requested by residents;
- clinical waste collections, where requested by residents;
- a seasonal Christmas Tree collection service from designated collection points; and
- on street litter and recycling collection as well as street cleansing services, which includes the separation of waste and recycling from street sweeper barrows.

1.2 About This Report

Eunomia has undertaken a detailed review of documents and data provided by the Corporation to assess whether:

- the policies and practices of the Corporation allow it to demonstrate that it has, as required by Regulation 12, taken “all such measures available to it as are reasonable in the circumstances” to apply the waste hierarchy; and
- the Corporation has the information in place to enable it to demonstrate if separate collection of one or more of the four recyclable materials specified in the law (glass, metal, paper, plastics) is necessary (to facilitate or improve recovery) and practicable.

The report identifies any gaps in the Corporation's current evidence base, and the opportunities for the Corporation to take action to demonstrate compliance. It provides the Corporation with:

- a list of the data and written evidence of policies and decisions that would be required to demonstrate compliance; and a 'gap-analysis', detailing exactly what information is already held by the Corporation, whether the evidence is likely to meet the standards required, and where data-gaps are evident or additional work may be required to build the evidence base (Section 3.0 and Section 4.0);
- an explanation of the modelling methodology used in this report (Section 5.0 **Error! Reference source not found.**);
- an examination of whether separate collection of the four recyclable materials specified in the law (glass, metal, paper, plastics) is necessary in the City of London (Section 6.0);
- an examination of whether separate collection of the four recyclable materials specified in the law (glass, metal, paper, plastics) is practicable in the City of London (Section 7.0); and
- a summary of the Corporation's likely position with respect to the Regulations, where opportunities exist to demonstrate compliance within the current collection model and an overview of next steps in order to secure the Corporation's position (Section 8.0).

2.0 Regulatory Background

The following sections provide further detail on each of the key regulations.

2.1 Regulation 12: Waste Hierarchy

Regulation 12 places no restriction on the types of waste to which the hierarchy should be applied.⁵ Under the Regulations, the waste hierarchy must therefore be applied to each type of material collected, whether it is currently separated for recycling, or collected as part of the residual waste stream. The Department for Environment, Food and Rural Affairs (DEFRA) has produced detailed guidance on how to apply the waste hierarchy, which may be a helpful addition to this summary.⁶

It is important to consider first the steps that could be taken to achieve the highest levels of the hierarchy, before considering whether it would be "reasonable in the circumstances" to manage waste at that level. Although compliance with the hierarchy is not optional, Regulation 12 states that departure from it is allowed when the measures that would be required would not be "reasonable in the circumstances", or where departure will "achieve the best overall environmental

⁵ Waste (England and Wales) Regulations (as amended), Regulation 12(1).

⁶ DEFRA (2011) *Guidance on Applying the Waste Hierarchy*, June 2011, <http://www.defra.gov.uk/publications/files/pb13530-waste-hierarchy-guidance.pdf>

outcome where this is justified by life-cycle thinking on the overall impacts of the generation and management of the waste”.

When considering the ‘overall impacts’ the following must be taken into account:

- the general environmental protection principles of precaution and sustainability;
- technical feasibility and economic viability protection of resources; and
- the overall environmental, human health, economic and social impacts.⁷

In practice, moving less widely recycled materials (those other than glass, metal, paper, plastic and perhaps food) up the hierarchy may in many cases necessitate collecting it separately from residual waste – and often from all other materials.

The wording of Article 4 of the WFD is also relevant to the interpretation of the waste hierarchy. As well as considering what may justify departure from the waste hierarchy, Article 4(2) explains that when applying the waste hierarchy you should “take measures to encourage the options that deliver the best overall environmental outcome.” The best environmental outcome, perhaps identified through lifecycle thinking, may therefore be a relevant consideration in deciding what approach to recycling should be adopted – not just in deciding whether downward departure from the hierarchy is allowable.

2.2 Regulation 13: Separate Collection

The “necessity” and “practicability” tests are two tests that, if met in respect of any of the four materials (glass, metal, paper/card, plastic), mean that separate collection of that material is required.

There is no statutory guidance on how to determine whether separate collection is “necessary” or “practicable”. However, WRAP, the London Waste and Recycling Board, and Waste Network Chairs commissioned Eunomia to prepare a “Route Map” to assist authorities in interpreting the law.⁸ The Environment Agency has signalled that it will take account of the Route Map as part of its regulatory approach.⁹ The advice in this report is therefore closely based on the approach set out in the Route Map.

Applying the tests will require authorities to gather and assess a good deal of information to demonstrate the reasoning supporting the decisions they have made, or to undertake new work to determine if changes to their collection system are required by law.

Further detail on the key terms used are outlined in the sections below.

⁷ Waste (England and Wales) Regulations (as amended), Regulation 12(3)

⁸ WRAP, and LWARB (2014) *Waste Regulations Route-map*, April 2014

⁹ Environment Agency (2014) *Separate Collection of Recyclables: Briefing Note*, June 2014

2.2.1 *Technically Practicable*

The European Commission guidance on the WFD says that “‘Technically practicable’ means that the separate collection may be implemented through a system which has been technically developed and proven to function in practice.” In order to establish whether separate collection is likely to be technically practicable for an area, it should be established whether separate collection systems have previously been developed and proven to function in practice in an authority with similar relevant characteristics; or whether there are specific local issues that make separate collection inordinately difficult.

The material collected through separate collection would also have to be technically capable of being recycled. The range of materials that can be recycled is growing, and some investigation of recycling options would be needed to support a conclusion that, for example, due to a lack of available processing capacity it is only technically practicable to collect plastic bottles, not other plastics. If processing capacity is available, but not cost effective, this would be an issue of economic practicability.

2.2.2 *Environmentally Practicable*

The European Commission guidance on the WFD says that “‘Environmentally practicable’ should be understood such that the added value of ecological benefits justifies possible negative environmental effects of the separate collection (e.g. additional emissions from transport).” A system will therefore be environmentally practicable if the benefits from increased or improved recycling outweigh any negative impacts.

However, it is reasonable to expect the environmental benefits of any normal form of collection of the four materials to outweigh the environmental costs. The Route Map therefore suggests that it may be reasonable to look at the relative costs and benefits of different collection systems.

Whilst the default option is separate collection, if co-mingled collection seems to lead to substantially better environmental performance over all, this may be evidence that it is permissible.

2.2.3 *Economically Practicable*

The European Commission guidance on the WFD says that “‘Economically practicable’ refers to a separate collection which does not cause excessive costs in comparison with the treatment [including recycling] of a non-separated [co-mingled or residual] waste stream, considering the added value of recovery and recycling and the principle of proportionality.”

‘Economically practicable’ does not mean ‘the cheapest option’. Separate collection will be economically practicable so long as the cost is not excessive, or disproportionate to the benefits. Except where any extra costs of separate collection are very small or very large, assessing ‘proportionality’ is not straightforward. It may not be sufficient to show, for example, that the extra costs would marginally exceed the current waste budget.

Authorities that have entered into long-term waste collection or disposal contracts that make it difficult for them to implement separate collections, especially if they have done so since the Regulations were implemented in their current form in 2012, will need to consider carefully how to take account of any constraints or termination costs associated with the contract. Termination or variation costs might be looked at separately from the basic economic case for the choice between separate and co-mingled collections.

2.2.4 *High Quality Recycling*

Whilst “high quality recycling” is not mentioned in Regulations 12 and 13, Defra’s Waste Management Plan for England, to which local authorities should have regard, states that “in effect” the Regulations “require the separate collection of waste paper, metal, plastic and glass from 2015 onwards wherever separate collection is necessary to get high quality recycling, and practicable.” The plan, which is itself a requirement of Regulation 7, is the principal way in which Article 10 of the WFD has been transposed into the law of England.

There is no simple definition of “high quality” recycling, and a number of competing definitions emerge from the legislation and associated documents. These are explored in more detail in Section 0.

3.0 Analysis of Information Provided by the Corporation

This section summarises the information supplied by the Corporation as evidence relevant to the demonstrating compliance with the Regulations.

3.1 Regulations 12: Waste Hierarchy

The information provided by the Corporation regarding its application of the waste hierarchy is set out in Appendix **Error! Reference source not found.**. The information supplied has been sufficient to allow a detailed analysis to be carried out.

Actions taken by the Corporation to apply the waste hierarchy are summarised in Table 3-1 for all major material streams. Numbers in square brackets after each action refer to the document in which evidence for the action has been found. A full list of the documents referenced can be found in Appendix 0.

Table 3-1: Summary of Actions Taken to Apply the Waste Hierarchy

Material	Actions Taken		
	Prevention/Reduction	Reuse	Recycling
Dry recycling	<p>Mail Preference Service/No Junk Mail campaign [1]</p> <p>Smarter Shopping (although this campaign was last run more than 2 years ago) [1]</p>		Co-mingled collections of paper, cardboard, glass, mixed plastic, tetra paks, foil, plastic bags, cans and aerosols [1, website]
Food	<p>Love Food Hate Waste Campaign [1, web]</p> <p>WRAP funding received to deliver workshops, cookery demonstrations and distribute information to businesses and residents [1, 12]</p>		Food waste collections available at all 4 estates as well as some of the private blocks [1, website]
Bulky		<p>Partnership with London Re-Use Network who collect reusable bulky items for resale [1,4]</p> <p>Recycling Team currently assessing whether material can be pulled out of bulky collection points on estates to be sent for reuse or recycling [13]</p> <p>Give and Take Days [1, 7]</p>	<p>Recycling Roadshow [1]</p> <p>Push bike recycling</p>
WEEE	Restart pop-up events [10a,b,c]	Give and Take Days [7]	Collected in bring banks on the 4 estates [1]
Batteries			Collected in bring banks on the 4 estates and in battery bins located in public buildings e.g. libraries [1]
Low Energy Light Bulbs			Collected in bring banks on the 4 estates [1] and

Material	Actions Taken		
	Prevention/Reduction	Reuse	Recycling
			battery bins located in public buildings e.g. libraries
Textiles		Give and Take Days [7]	Collected in bring banks on the 4 estates [1]
Nappies	Real Nappies Campaign [1]		
Clinical	Free collections service where required – but evidence not provided regarding how it is treated [1]		
Streets/Litter			Street sweepings are manually sorted using split compartment sweeper barrows (comingled dry recycling and residual) [11]

3.2 Regulation 13: Separate Waste Collection

This section summarises the Corporation’s current collection system as set out in the proforma returned by the Corporation. The proforma relating to separate collections can be found in Appendix **Error! Reference source not found.** The Corporation has been able to supply the majority of information that would be needed to fully apply the necessity and practicability tests.

4.0 Waste Hierarchy Analysis

This section summarises the findings of a gap analysis relating to the Corporation’s evidence in regard to its application of the waste hierarchy.

4.1.1 *Waste Hierarchy Evidence of Policies and Decisions*

The documents provided by the Corporation demonstrate a clear understanding of the waste hierarchy legislation, which has been incorporated into its policies and is evidenced through action.

The Corporation provided evidence of policies, and actions, which addresses the requirement to apply the waste hierarchy for most materials. The Corporation can identify specific practical measures (see Table 3-1) carried out to implement the hierarchy that would provide a clear basis for the justification of its approach in respect of the key materials and waste streams, and many of the more minor ones, were it to be challenged.

All domestic residual waste is sent to energy recovery, with none going direct to landfill, ensuring that as little waste as possible is managed at the very bottom of the hierarchy.

It collects a wide range of materials from residential properties (including less commonly collected materials such as plastic pots, tubs and trays and tetrapaks), offers a food waste service to many of its residents and has a good network of bring sites that enable other materials, such as textiles and WEEE, to be collected on the City's four estates. Some material is also separated for recycling from the street litter that is collected by the Corporation, which is something that relatively few councils can boast.

The Corporation has been active in seeking to implement schemes to encourage residents to reuse items such as WEEE, clothes and bulky goods. It has entered into an arrangement with London Re-Use Network to try to further promote the reuse of furniture, and is examining the case for further action to identify potentially reusable bulky items collected from the bulky collection points on the estates.

The Corporation can also evidence steps that it has taken to promote waste prevention. Examples include its adoption of the Love Food, Hate Waste (LFHW) campaign and its efforts to encourage parents to try reusable nappies for their children are particular examples.

We were unable to establish with certainty how the clinical waste is managed, but our understanding is that this material is incinerated. There is unlikely to be any reasonable way of moving this material further up the waste hierarchy due to health and safety risks. The Corporation is clearly aware that the full potential for reuse and recycling of bulky waste is not yet being exploited, and is considering further steps to promote this.

Nevertheless, the Corporation could improve its ongoing readiness to respond to an enquiry regarding its waste hierarchy compliance by maintaining a document that tracks work done in this area.

Recommendation 1: The Corporation may wish to produce and maintain an overview, based on

Table 3-1, to evidence the actions carried out to implement the waste hierarchy and the rationale for their selection.

Compliance with the waste hierarchy is an ongoing requirement, and the Corporation may wish to ensure it maintains a forward plan of work in this area, which might be incorporated into the Recycling Action Plan.

Recommendation 2: The Corporation may wish to ensure that it has a clear timetable in place showing planned actions relevant to the waste hierarchy.

The Corporation is already considering whether there are additional measures which could cost-effectively help to divert additional bulky waste to higher levels of the hierarchy, not least through encouraging reuse. Whilst efforts are clearly made to divert material from the residual stream, and no material is sent directly to landfill, the Corporation may wish to set out its rationale for continuing to send recyclable and reusable material to incineration (e.g. that it has put in place all cost-effective measures, including awareness raising work, to encourage residents to move waste up the hierarchy).

Recommendation 3: The Corporation may wish to include in its Recycling Action Plan a rationale for incineration of certain material streams and state why it is not reasonable to take action to move these materials further up the waste hierarchy.

4.1.2 Data

The Corporation has been able to supply much of the data that we would expect it might need to rely on if challenged regarding its compliance with the hierarchy. However, a few areas where further work may be worthwhile have been identified.

In common with many other authorities, the Corporation cannot at present clearly evidence the effectiveness of the measures it has taken to prevent waste and encourage reuse and recycling, although it has taken sensible steps to try to monitor this where possible. This has revealed, for example, that the arrangement with London Re-Use Network has not yet delivered the level of diversion that was hoped for, and given the Corporation the opportunity to consider whether other measures might be employed to boost reuse.

The Corporation has not yet quantified the impact on waste arisings of its efforts to encourage waste prevention and preparation for reuse for other household waste arisings. Whilst waste prevention in particular is not entirely straightforward to evaluate, there are approaches that can be used to provide credible estimates. Noting the inherent difficulties in quantifying these impacts, the Corporation should record any decision made regarding whether such an assessment is feasible.

Recommendation 4: An analysis of the impact of waste prevention and reuse measures would provide the Corporation with further evidence of the effectiveness of the actions they have taken to apply the waste hierarchy; if this is not deemed feasible, the Corporation should record the reasons why.

5.0 Options Appraisal Methodology

The Waste Regulations Route Map indicates that in order to carry out the necessity and practicability tests, an options appraisal may be required in order to determine the likely costs and outputs of a separate collection system. Eunomia has followed this suggested approach in order to examine the implications of the tests.

5.1 Our Approach to Collection Options Appraisal

Eunomia's 'Practicability and Necessity' model (PAN) has been used to calculate the performance and costs associated with different doorstep waste collection scheme configurations for the Corporation. This model has been developed specifically to cost-effectively compare collection systems in relation to the requirements of the Regulations. Whilst it is a relatively simple model, it relies heavily on assumptions and an approach that are common to other such options appraisal tools.

In the model, a 'baseline' was created to represent the Corporation's current service. The aim of the baseline is to reflect the resources and logistics of the expected model as accurately as possible, so that it serves as a reliable foundation for testing various alternative collection options. Authority-specific inputs to the baseline include information regarding the Corporation's number and type of households, current services and service performance, resources, and waste composition. Known inputs (from the perspective of the model these include tonnages of each material type collected, numbers and types of households offered the service, tipping locations as per the current collection system, including the new MRF location) are calibrated to known outputs (which in modelling terms includes the numbers of crew and vehicles used to deliver the collection services).

Put simply, the baseline model should accurately reflect the Corporation's current:

- recycling composition and tonnages;
- demographic characteristics (household numbers, population, housing types);
- travel logistics (distance, pass rate); and
- current vehicle and container types and costs.

This creates a sensible basis from which to establish the change in resource requirements for different potential future service configurations, ensuring that the Corporation's specific constraints are properly reflected.

The likely performance of new schemes is then driven by comparing the authority's collection pass rate with an expected value based on data available from other authorities operating similar schemes, and factoring in the extent of urban and rural collections within the authority – the City of London is 100% urban. This pass rate factor, which reflects the actual number of properties from which material may be collected on a round, is then used to generate expected pass rates for alternate collection approaches. This dictates the expected level of resources needed to undertake collections.

The model automatically builds up the costs associated with the baseline and future schemes based on unit cost data extracted from a database. The numbers of vehicles, containers, and crew required are multiplied by the unit costs to derive an overall cost for the baseline and each future scheme option in turn.

Alongside this, separate standard assumptions are made regarding recycling compositions and yields and within different collection systems and frequencies. These are combined with material, vehicle and crew financial information, using the Corporation's own data wherever possible, in order to calculate expected net system costs.

Annual costs include the amortised cost of capital using standard depreciation periods and interest rates. The model for the Corporation does not include costs such as spare vehicles, supervisors, depot costs, overheads, and internal recharges. Since the total baseline cost is not being developed in the scope of this project, only relative costs are reported in the results sections below.

5.2 Options Modelled

Because of the housing stock in the City of London and the very limited storage space available to residents for waste receptacles, the City has a highly unusual waste collection system, with some households able to receive collections six days per week both from the doorstep and communal bins. Other estates receive collections two days per week and more frequent collections from the communal bins, whilst other residents use only communal bins for waste and recycling.

These restrictions make the development of a workable multi-stream recycling collection system unusually difficult. It would not be reasonable to expect most residents to make use, for example, of normal 55L boxes from which recyclables could be sorted as these would be impractical as well as potentially posing health and safety risks due to storage issues; and the stillage vehicle ('RRV') collection vehicles that would typically be used for multi-stream collections would be unsuitable for emptying communal bins of source separated recycling. It would also be impossible in the majority of cases to fit four recycling bins into the footprint occupied by the current communal co-mingled recycling bins.

A number of options were considered, including the replacement of the current transparent recycling sacks with up to four different coloured sacks, which would then be placed in the same bins and/or collected in the same standard RCVs as at present, while relying on subsequent automated or manual separation of the sacks by colour to deliver the effect of separate collection – a model used in several urban areas in Norway.

However, we are concerned that this would be likely to be an ineffective model. It is likely that there would be significant cross-contamination through split bags; and it would be profoundly difficult to communicate to residents the reason why they were being asked to carefully separate materials into bags that were then to be placed in the same bin/vehicle; this would be likely to lead to poor levels of compliance with the scheme by residents.

We do not consider it likely that it would be acceptable in terms of service for householders that currently receive a daily service for recyclables to move to an

“alternate daily” system, which would require them to keep certain recyclables in sacks in the home overnight. Were this acceptable, the Corporation would be likely to have adopted somewhat less frequent collections in respect of its current mixed recycling system.

We have therefore modelled the following options, set out in Table 5-1.

Table 5-1: Options Modelled

Option	Dry Recycling	Food Waste	Residual Waste
Baseline	Collections of co-mingled material using Corporation-supplied clear sacks 2-6 days per week from most properties, with most material collected from communal bins	Caddy collected at same frequency as dry recycling for City estates with doorstep collections. Private blocks receive weekly collection from communal bins and some households do not receive food waste service (no bin store).	Collections of residual waste using resident-supplied sacks 2-6 days per week from properties with bin stores. Properties without bin stores, receive Corporation-supplied white sack collected 6 days per week.
Option 1 - Separate Collection	Three-stream collections of paper/card, plastic/metal and glass in Corporation-supplied coloured sacks 2-6 days per week from most properties, or from communal bins.	Same as baseline	Same as baseline
Option 2 - Separate Paper	Two-stream collections of paper/card, separate from other material in Corporation-supplied coloured sacks 2-6 days per week from most properties, or from communal bins.	Same as baseline	Same as baseline

The separate collection system proposed (Option 1) employs three-streams:

- Paper/card;
- Glass; and
- Plastic/metals (cans, aerosols, etc).

This approach is intended to be readily used by as many householders as possible.

Paper and card are widely collected together and can be sorted to a good standard. Many “source separated” collection systems in fact collect plastics and metals together, since they too can be separated from one another with a high degree of accuracy.

For householders who currently do not have access to communal bins, the system would require them to use three different coloured sacks. This would clearly be less convenient than the current system, but many households would not need to use all three colours every collection day. For householders that use communal bins, we propose that wherever space permits, the current single large bin should be replaced with three smaller wheeled bins occupying approximately the same footprint. If possible, the bin for paper and card should be slightly larger than those for the other materials to reflect the likely space requirements.

For properties where there is insufficient room for three bins, it is suggested that no glass bin be provided, and that where possible mixed glass bring banks be installed as nearby as is feasible; these could be emptied on the same round as the household collections. In properties where space is extremely limited it might be possible to use communal 3BoxStack™ bins, which would allow for collection of glass, paper and card and containers (plastic and cans) materials in separate boxes within a bin with the footprint of a standard 240L bin – although the small amount of containment space available would clearly necessitate very frequent collections.

In order to collect these materials at the current frequency, it would be necessary for an additional splitback vehicle and crew to be employed. Our expectation is that the paper and card would be collected in the standard RCV, while the plastic/cans mix and the glass would be placed in the two chambers of the splitback.

We have priced in the cost of additional depot space – which might need to be obtained in a neighbouring authority if no space is available in the City – for the additional vehicle. It is further assumed that recycling would be bulked within the expanded depot, and that some basic sort line technology would be installed to enable waste the mixed plastic and metals stream to be separated prior to onward sale – a practice carried out by numerous other authorities. Clearly this would be a significant logistical challenge, and could not take place within the current depot. However, it is not wholly impracticable.

The two-stream collection system proposed (Option 2) involves separating paper and card from the other dry recycling in order to improve the quality and value of the fibre stream:

For householders who currently do not have access to communal bins, the system would require them to use two different coloured sacks. This would be somewhat less convenient than the current system, but many households would not need to use both colours every collection day. For householders that use communal bins, we propose that, the current single communal bin should be replaced with two smaller wheeled bins or stacked containers occupying approximately the same footprint.

In order to collect these materials at the current frequency, it would be necessary to switch recycling to a splitback vehicle. This would have a lower collection efficiency than the current single stream method, but it is assumed that the rounds could still be accomplished.

We have again priced in the cost of additional depot space so that paper can be bulked at this location.

In both options, all other elements of the service would continue in their current configuration.

5.3 Environmental Model

The PAN model also contains assumptions derived from the Environment Agency's WRATE model regarding the CO₂ emitted and saved through

- the collection and reprocessing of recycling; and
- the benefit derived from avoiding the need for virgin materials

to provide a proxy for the overall environmental impact of different collection systems. This enables the environmental practicability of different collection options to be considered.

6.0 Necessity Test

This section addresses the 'necessity test', and seeks to establish whether separate collection of waste streams is, in the words of the Waste Regulations, "is necessary to ensure that waste undergoes recovery operations in accordance with Articles 4 and 13 of the Waste Framework Directive and to facilitate or improve recovery". If separate collection is not necessary, the law does not require it.

There is no definition of "facilitate" or "improve" given in the Waste Framework Directive, the Regulations or any guidance document. However, the Waste Regulations Route Map advises that:

- "Facilitate" means to make possible or easier. If a measure "facilitates" recovery, it might be expected to result in the amount of material recovered rather than sent for disposal being increased.
- Recovery is "improved" if it achieves better results. Recovery may therefore be "improved" if:
 - more waste is recycled rather than subject to other recovery; and/or
 - more of the recycling is "high quality".

6.1 Facilitating Recovery

If a separate collection system facilitates recovery, the quantity of material expected to be recycled should increase when it is implemented. Predicting the results of a collection system so unusual as that proposed for the City of London is difficult, but based on the closest approximations within our experience, the expected tonnage of recycling collected as a result of the separate collection approach is compared with the baseline in Table 6-1.

Table 6-1: Dry Recycling Collected Compared with Baseline (tonnes/year)

Material	Baseline – Co-mingled	Option 1 – Separate Collection	Option 2 – Separate Paper
Co-mingled	808	0	0
Mixed Glass, Metals and Plastic	0	0	341
Mixed Paper & Card	0	385	427
Glass	0	145	0
Mixed Plastic and Cans	0	101	0
Total Dry Collected	808	632	768
MRF Rejects	-65	-5	-31
Total Dry Recycled	743	627	737
Food Waste	96	96	96
Residual Waste	1,520	1,697	1,595

Separate collection is expected to yield 176 tonnes/year less collected material than the current baseline; Option 2 means a 40 tonne/year reduction. This reflects the additional complexity of the collection systems, and as well as the fact that we would anticipate a reduction in the amount of non-target material being collected where materials are separated.

Because the contract with Veolia MRF in Southwark is at an early stage, no data is available at the time of writing regarding the level of rejects from the Corporation's material. However, since no change is being made to the collection system, it is reasonable to assume that the level of input contamination will remain the same, and in the absence of other information we therefore make use of the previous MRF's reject rate. The material rejected by the MRF is added to the Corporation's residual waste. Net of MRF rejects, the difference in performance is reduced, with the current system still performing marginally better than Option 2 (4 tonnes/year) and considerably better than Option 1.

These results indicate that there is no convincing argument that compared with the current baseline separate collection would boost the quantity of recycling in the City of London.

The Regulations state that separate collection is required if it is necessary in order to *facilitate* recovery. The Route Map explains that this can be understood to mean that separate collection is required if it could be expected to yield an increase in the volume of material collected. Our findings indicate that neither two nor three-stream collections would be expected to facilitate recovery.

6.2 Quality of Material

If a separate collection system *improves* recovery, the *quality* of material expected to be recycled should increase when it is implemented. In common with many other authorities, the Corporation has not previously made a detailed assessment of the quality of the recyclate that would result from different collection systems.

There are several possible definitions of 'high quality recycling' that the Corporation might consider:

1. Article 11 of the Directive appears to define 'high quality' in terms of "the necessary quality standards for the relevant recycling sectors". This can be understood in three main ways:
 - a. Some have argued that any recyclable material for which an off-taker can be found must of necessity meet the standards of some part or other of the recycling sector. Therefore, all recycling is high quality – only if recyclate is so poor that it cannot be recycled at all would it fail to qualify.
 - b. If the Corporation's material attracts premium prices, this might be indicative of it being high quality.
 - c. Alternatively, the Corporation could compare the purity of its MRF outputs with the input specifications of UK reprocessors.¹⁰ Materials that meet the reprocessors' standards could be deemed to be high quality. This is a lower-risk approach, but sets a standard that many MRFs seem likely to find it difficult to meet.
2. Section 4.3.4 of the Commission's guidance on the Waste Framework Directive relates "high quality" to the standards achieved through separate collection. It gives two somewhat different statements, advising that separate collection is not necessary if:
 - a. "the aim of high-quality recycling can be achieved just as well with a form of co-mingled collection". This suggests that co-mingled collection can be used only if the resulting material can be recycled in just the same way as separately collected material, i.e. there is no use to which it cannot be put that separately collected material could be; and
 - b. "subsequent separation can achieve high-quality recycling similar to that achieved with separate collection". This suggests that some minor differences in the recycling achieved may be permissible.

Of course, one of the key determinants of quality is the end use to which material is put. We have received information regarding the end destinations of material from the Veolia MRF at Southwark. This lists a range of paper mills and glass, metal and plastics reprocessors, and indicates that significant amounts of

¹⁰ Resource Association *Recycling Quality Specifications*, accessed 5 August 2014, <http://www.resourceassociation.com/recycling-quality-specifications/>

material go to closed loop recycling. However, the information does not indicate the proportion of the material that goes to closed loop or open loop uses.

In order to properly assess whether separate collection is necessary in order to improve the quality of recycling, the Corporation would need to obtain an assessment of the quality of the final recyclate outputted from its MRF so that this can be compared with the likely purity of a separate collection system. Because the MRF contract with Veolia is sufficiently new that no output purity figures have yet been reported. However under recent amendments to the Environmental Permitting Regulations (the so-called MRF Regs), larger MRFs will be required to undertake regular sampling of their output streams.¹¹ It should therefore be possible for the Corporation to obtain information regarding output purity from the MRF in the near future, and the Corporation should make clear that it would like to receive this information as soon as possible.

In the short term, it is possible to use reasonable estimates of the output purity as the basis for an assessment. The figures we deem most applicable to the Corporation's collections appear in bold in

¹¹ HM Government (2014) *The Environmental Permitting (England and Wales) (Amendment) Regulations 2014*, 10th February 2014,
http://www.legislation.gov.uk/ukxi/2014/255/pdfs/ukxi_20140255_en.pdf

Table 6-2 **Error! Reference source not found.** The table also contains two quality criteria – the typical performance of separate collection and the reprocessor quality standards specified by the Resource Association. Where the Corporation’s material meets or exceeds the standard, it is highlighted in green; where it contains more contaminants than the standard, this is highlighted in red.

Table 6-2: Contamination Rates Used in Model

Material	Typical MRF ¹²	Quality Criterion: Separate Collection ¹³	Quality Criterion: Reprocessor Specification ¹⁴
News and PAMs	9.8%	1.1%	1.0%
Paper	15.8%	0.9%	3.0%
Card	12.0%	4.1%	3.0%
Glass	10.4%	0.4%	1.0%
Mixed Plastic	15.8%	2.9%	6.0%
Aluminium	2.5%	1.0%	3.0%
Steel	6.2%	3.0%	N/a

The sack-based separate collection system proposed for the City of London is unlikely to perform as well as the kerbside sort separate collections used in other areas of the country, since material will not be hand sorted from boxes by operatives. Nevertheless, there would be more scope for them to visually inspect material during the collection process than with the co-mingled collections currently in use. The contamination rate for materials collected co-mingled would be expected to be at least double the typical separate collection figures. However, this would still be an improvement over the anticipated MRF results. If Option 2 were to be pursued, contamination rates for the separate paper and card would be expected to be the same as in Option 1, but the glass, plastics and metals would be little improved, especially if the same MRF were to be used as in the baseline.

The expected results for the current co-mingled material outputs can be seen to be likely to fall below the quality of typical separate collection in all cases, and below the Resource Association specifications for all materials other than aluminium. Therefore, unless the Corporation's MRF outputs prove in practice to be very pure, the Corporation would be likely to conclude that separate collection would *improve* recovery if it were to rely on any definition of "high quality" more taxing than 1) a or b above.

¹² Enviro Consulting (2009) *MRF Quality Assessment Study*, Report for WRAP, November 2009

¹³ Zero Waste Scotland (2014) *Contamination in Source-separated Municipal and Business Recyclate in the UK 2013*, March 2014, <http://www.zerowastescotland.org.uk/sites/files/zws/Contamination%20in%20source-separated%20municipal%20and%20business%20recyclate%20in%20the%20UK%202013%20240314.pdf>

¹⁴ Resource Association *Recycling Quality Specifications*, accessed 5 August 2014, <http://www.resourceassociation.com/recycling-quality-specifications/>

Recommendation 5: Further work to obtain actual MRF output data would allow a reassessment of whether separate collection is necessary in order to improve recovery. The Corporation will need to reach a view on what it considers to be “high quality recycling”.

6.3 Conclusions

On the basis of the modelling undertaken and the information provided by the Corporation:

- it appears that neither a separate collection nor a separate paper system would be expected to increase the amount of recycling collected. Separation is not therefore “necessary” (in the technical language of the Regulations) to *facilitate* recovery of the four materials;
- however, depending on the view taken on the definition of “high quality recycling” it appears that separate collection may be necessary (in the technical language of the Regulations) in order to *improve* recovery of materials; but
- MRF-specific contamination data, if available in the future, may allow the Corporation to revisit the question of whether separate collection is necessary in order to *improve* recovery.

Separate collection is necessary if it will either facilitate or improve recovery. The results therefore indicate that separate collection is necessary in the terms set out in the Regulations. We therefore move on to assess whether separate collection is practicable.

7.0 Practicability Test

The Practicability (TEEP) Test examines whether separate collection would be technically, environmentally and economically practicable. It must be practicable in all three respects in order for it to be required. However, for something not to be practicable is a ‘high hurdle’.¹⁵ It isn’t the same as it being difficult or inconvenient.¹⁶

7.1 Technical Practicability

The European Commission guidance on the Waste Framework Directive says that:

¹⁵ Defra, Letter to Local Authority Bodies on the Separate Collection of Waste Paper, Metal, Glass and Plastic, October 2013, p2.

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/250013/waste-seperate-collection-201310.pdf

¹⁶ Compare UK Recyclate Ltd and Others v Secretary of State for Environment, Food and Rural Affairs and Welsh Ministers, Royal Court of Justice, Case No. CO/6117/2011, paragraph 18

“Technically practicable’ means that the separate collection may be implemented through a system which has been technically developed and proven to function in practice.” (Section 4.3.4)

There is a history of kerbside sort collections being operated in both urban and rural settings, across a wide range of authorities. Unlike many other waste collection authorities, the City of London has not previously operated a form of separate collection, and the exceptionally high prevalence of flats and profound limitations on storage space for residents in the City mean that the established method of collecting material in boxes to be sorted onto a stillage vehicle is not practicable for the Corporation.

Devising an alternative separate collection system that would be workable in the City is challenging. However, there is an interplay between technical and economic practicability. Many technical issues with separate collection – for example, concerns regarding access or the storage space householders have available – are capable of being addressed, provided that sufficient resources are dedicated to the task.

We have taken these constraints into account in the development of our proposed options, as discussed in section 5.2. Whilst these differ from standard kerbside sort collections, they rely on established collection technologies, tailored to the specific circumstances of the City. While a number of points of detail would remain to be resolved if such a system were to be implemented, our view is that it is difficult to determine at this point that they are in principle insurmountable.

Whilst there are legitimate concerns regarding whether separate collections would be technically practicable in the City, it is not clear that these are fatal to the idea that such a system could be technically practicable. It therefore remains to explore whether separate collections would be economically and environmentally practicable.

7.2 Economic Practicability

The European Commission guidance on the WFD says that:

“Economically practicable’ refers to a separate collection which does not cause excessive costs in comparison with the treatment [including recycling] of a non-separated [co-mingled or residual] waste stream, considering the added value of recovery and recycling and the principle of proportionality.” (Section 4.3.4)

‘Economically practicable’ does not therefore mean ‘the cheapest option’. Separate collection will be economically practicable so long as the cost is not excessive, or disproportionate to the benefits. Except where any extra costs of separate collection are very small or very large, assessing ‘proportionality’ is not straightforward. It may not be sufficient to show, for example, that the extra costs would marginally exceed the current waste budget. It may even be proportionate to consider cuts to other discretionary expenditure in order to meet the legal obligations regarding separate waste collection.

7.2.1 Modelling Results

Eunomia has used its collection options appraisal tool in order to assess whether either three-stream collection (of paper/card, glass, and plastics/metals) or two-stream (of paper/card and other recyclable materials) may be economically practicable. The results of the economic modelling are set out in Table 7-1.

Table 7-1: Financial Performance of Collection Systems (£s)

	Baseline – Co-mingled	Option 1 – Separate Collection	Option 2 – Separate Paper
Vehicles	199,439	260,176	202,771
Staff	177,078	240,799	177,078
Additional Depot	0	250,000	100,000
Receptacles	42,625	124,369	83,497
Material Costs/ Income	2,425	-34,966	-20,319
Organics Processing	6,533	6,533	6,533
Residual Treatment	183,860	204,618	192,892
Net Cost	611,959	1,051,528	742,453

The modelling undertaken shows that separate collection (Option 1) would be 71.8% more expensive than the current baseline service. Separate paper would be 21.3% more expensive. Although the separate materials would yield an income, the relatively small amount of material available to be collected means this would be outweighed by additional collection, residual treatment and depot costs.

Whilst the additional costs of separate collection may be significant, if the Corporation proposes to argue that separate collection is not economically practicable, it would need to evidence not just that there would be additional expense and financial risk under separate collection, but that this would represent an excessive operational cost.¹⁷ This entails consideration of the balance between the costs and the benefits (including the environmental benefits) of separate collection; and of the Corporation's financial position, which will have a considerable bearing on whether it could reasonably meet any additional costs.

Alongside the operational costs of different collection models, the adoption of a separate collection system in place of a co-mingled system or two-stream system might result in transitional costs such as recruiting staff, setting up new materials

¹⁷ European Commission (2012) *Guidance on the Interpretation of Key Provisions of Directive 2008/98/EC on Waste*, June 2012, http://ec.europa.eu/environment/waste/framework/pdf/guidance_doc.pdf

contracts and legal and compensation costs associated with halting or amending the current contract with Amey, which runs to 2019. The Corporation may wish to identify these costs. We would recommend that operational costs should always be viewed separately from transition costs in assessing economic practicability. It appears legitimate for an authority to recognise that, operationally, separate collection might be economically practicable, whilst taking the view that contractual, infrastructural or capital considerations make change impossible in the short term.

Economically, separate collections seek to balance an investment in additional collection vehicles against a saving in sorting costs and higher material incomes. Achieving good material incomes may be more difficult for the City of London as a collector of relatively small quantities of recycling, but the proximity of numerous offtakers may mitigate this risk. As a result of the additional investment in collection infrastructure, the economics of separate collections are more heavily dependent on securing good material incomes than, typically, is a co-mingled collection. Therefore, if separate collections were introduced, the Corporation would be exposed to a degree of financial risk associated with future material values, from which it is at present shielded through its fixed price MRF contract.

Recommendation 6: In the context of this options appraisal and its financial circumstances, the Corporation should consider what level of expenditure on waste services is affordable, and what would qualify as “excessive cost”.

Recommendation 7: The Corporation may wish to assess the extent to which its contract with Amey can be exited or amended. If this cost is excessive, then this might constitute a further reason for deferring any change until procurement of a new contract is due in 2019.

7.2.2 *Conclusions*

On the basis of the modelling undertaken and the information provided by the Corporation:

- it appears that both separate collection and separate paper would be more expensive than the baseline collection system;
- because of the higher reliance on material sales income within separate collection systems to offset the additional operational costs of collection, increasing the level of separation will bring an inherently greater economic risk compared with co-mingled collections;
- the difference between the costs of the systems may be sufficiently large so as to make it likely that the either the two-stream or the three-stream system would represent the ‘excessive cost’ that guidance indicates makes separate collection economically impracticable.

If the Corporation were to rely on the argument that separate collection is not economically practicable, it would need to ensure that a clear, high level decision was reached regarding the level of expenditure on waste collection (plus any agreed knock-on costs and material income risk) that is acceptable. The Corporation would need to explicitly take the view that the level of additional

expenditure would, in its circumstances and in the light of the environmental performance of different collection systems, represent an ‘excessive cost’.

7.3 Environmental Practicability

The European Commission guidance on the WFD says that:

“Environmentally practicable’ should be understood such that the added value of ecological benefits justify possible negative environmental effects of the separate collection (e.g. additional emissions from transport).”
(Section 4.3.4)

A system will therefore be environmentally practicable if the benefits from increased or improved recycling outweigh any negative impacts. However, this test is likely to be met by almost any recycling collection system, since the benefits achieved through recycling should almost always outweigh the environmental impacts of its collection and processing.

7.4 Modelling Results

The results of the environmental modelling are shown in Table 7-2.

Table 7-2: Environmental Benefit of Collection Options (Tonnes of CO₂e/yr)

	Baseline – Co-mingled	Option 1 – Separate Collection	Option 2 – Separate Paper
Dry Recyclables	258	341	336
Organics	16	16	16
Transport	-17	-22	-17
MRF	-16	0	-7
Net Carbon Benefit	241	334	328

As anticipated, each collection system meets the minimum practicability requirement of its costs being outweighed by its benefits. The greatest net benefit comes from Option 1, yielding 38.7% more net carbon benefit per year than the current baseline service. Although transport emissions are higher, the benefit from the increased benefit from the separate dry recyclables and the avoidance of using a MRF result in a greater net environmental benefit.

7.4.1 Conclusions

The results of the modelling show that separate collection is environmentally practicable, and outperforms the current approach by a significant margin.

8.0 Conclusions

8.1 Overview

At present, a good deal remains uncertain regarding how the Waste Regulations will be enforced. The Environment Agency has begun to outline its approach to enforcement, but has not yet indicated how active it proposes to be in its role as the enforcement body for this legislation; nor have any third parties disclosed an intention to seek to clarify the requirements of the law by pursuing legal action against authorities.

As a result, there is a risk that some authorities may act in anticipation of enforcement action that may not in practice be forthcoming; there is also a risk that some authorities may do too little, and find themselves subject to attention from either the Environment Agency or third parties that results in them needing to make changes. For authorities that have followed the Waste Regulations Route Map process and acted on the findings, the likelihood of these risks emerging is in all probability low, although the impact of enforcement, and the need to make change in some haste, may be high.

Our recommendations here are intended to set out a course of action that the City of London Corporation can pursue that will help to minimise these risks. Authorities that have set out a clear path towards compliance will have a reasonable position to rely on if challenged regarding their approach to the Regulations, but can avoid taking action that may be precipitate.

8.2 Regulation 12: Waste Hierarchy

Our review suggests that the waste hierarchy has been given due consideration in the design of the City of London Corporation's service, although it would be sensible to ensure that the work it carries out in this area is actively tracked and monitored through its Recycling Action Plan.

With a small amount of further work to check that a full range of actions has been considered and the most effective ones implemented, the Corporation will be in a good position to respond effectively to any hierarchy-based legal challenges that can reasonably be envisaged.

Recommended actions which the Corporation may wish to consider in relation to the waste hierarchy are listed in Appendix A.4.1.

8.3 Regulation 13: Separate Collection

8.3.1 *Necessity Test*

The analysis carried out indicates that separate collection of the four materials:

- does not appear to be necessary in order to *facilitate* recovery, since it would not increase the amount of material captured;
- appears likely to be necessary in order to *improve* recovery, assuming that:

- the term “high quality” is interpreted in one of the more demanding senses set out in section 6.2, whereby the MRF outputs are assessed against reprocessors’ published input requirements, or to mean rejected as too risky to rely on; and
- the Corporation’s MRF output contamination rates are similar to those modelled, as council-specific data regarding its new MRF was not available.

Due to recent amendments to the Environmental Permitting Regulations, it may be that output quality data will become available from the MRF in the near future. The Corporation may wish to revisit the necessity test when this is the case.

There are interpretations of “high quality” available that the outputs from the Southwark MRF would be likely to be consistent with, and the Corporation may wish to consider whether it is happy to accept such a definition. If it decides that separate collection is not necessary in order to *improve* recovery, separate collection would not pass the necessity test.

8.3.2 *Practicability Test*

There are legitimate concerns as to whether a technically practicable approach to separate collections is available given the nature of the City’s housing stock. Lack of storage space and a heavy reliance on communal bins mean that a system using stillage vehicles would not be workable. However, it is plausible (if not entirely certain) that, with sufficient resources, a collection system could be implemented that would rely on established collection methods (sacks, communal bins, RCVs) but would achieve a substantially greater level of separation than at present.

The modelling work carried out on two such collections indicates that they would be environmentally practicable. However, there is a clear argument that it may not be economically practicable based on the findings that:

- separate collection would be 71.8% more expensive than the Corporation’s baseline option; and
- separate collection would expose the Corporation to greater financial risk in the event of a downturn in the secondary materials market.

There may be additional costs that the Corporation might identify that could be associated with operating a separate collection system, including the transitional costs of amending its contract with Amey.

Recommendation 8: The Corporation may now wish to gain appropriate internal sign-off for the proposition separate collection is necessary, technically practicable and environmentally practicable; to decide whether the additional costs and inherent financial risk amounts to making it not economically practicable, by virtue of representing an ‘excessive cost’; and to decide if there are financial reasons why a transition to a separate collection system might in any case not be feasible in the short term.

APPENDICES

A.1.0 Supporting Information Provided by the Corporation

The following tables present a gap-analysis of information provided by the Corporation in response to a proforma supplied by Eunomia. The information is of two main kinds:

- Key data that would be required in order for the Corporation to undertake an options appraisal comparing the performance of separate collection with that of any preferred collection model (e.g. the Corporation's current approach), an essential part of the Route-map process; and
- Evidence of policies and decisions made by the Corporation regarding which materials will be collected and the collection method to be employed, to examine whether the reasoning and evidence supporting the decisions is consistent with the Route-map's interpretation of the Regulations.

Each element of information required is described in the left hand column(s). The relevant evidence provided by the Corporation is recorded (short summaries of policies are included), and where the evidence is supported by a document a reference number is provided in square brackets. A key to the reference numbers can be found in Appendix 0. The final column records Eunomia's assessment of the evidence. This may be:

1. Complete: The Corporation has the required information and this is of a standard to enable it to be relied on in an assessment of compliance;
2. Work Required: The Corporation has relevant information, but it is either incomplete or requires some additional input to enable it to be relied upon; and
3. Absent: The Corporation was not able to provide the required information.

A.1.1 Regulation 12: Waste Hierarchy

A.1.1.1 Waste Hierarchy Checklist: Written Evidence of Policies and Decisions

Table A - 1: Written Evidence of Policies and Decisions Required for Waste Hierarchy Compliance Evaluation

Descriptor	Sub-Descriptor	Document	Description	Rating
Policy/decision regarding waste hierarchy approach to each waste stream (refuse and recycling)	Household	[1, 9]	Document 1 describes the current collection system and sets out the Corporation's aim to increase reuse and recycling and reduce waste arising, clearly indicating waste hierarchy awareness [1] Document 9 confirms the operation of a push bike reuse/recycling scheme	Work Required [Ensure each waste stream is tackled explicitly in the Recycling Strategy]
	e.g. HWRCs	[1]	There are no HWRCs in the Corporation. Residents can use neighbouring council facility	N/A
	e.g. Bulky	[1,4,13, website]	The Corporation provides bulky waste collections where residents can either phone up for a collection (£27 for up to 3 items or 10 bags) or take their items to the bulky waste storage area on estates where this is available [1] The Corporation also operates a bulky reuse collection where residents phoning in for a collection of a reusable bulky item are transferred to London Re-Use	Work Required [Provide rationale for non-recycling of bulky waste]

Descriptor	Sub-Descriptor	Document	Description	Rating
			Network [1,4]	
	e.g. Commercial		The Corporation does not provide a commercial collection service	N/A
	e.g. Street sweepings	[1,11]	Street sweepings are part recycled using split compartments in sweeper barrows to collect co-mingled recycling (paper, glass, plastic bottles and cans. Mechanical one stream vehicles are also used [1,11]	Complete
	e.g. Litter bins	[1]	On street recycling bins for mixed recyclables and paper were trialed but withdrawn [1]	Work Required [Ensure evidence is in place to justify withdrawal]
Written policy/decision regarding the waste hierarchy approach to each material type	Dry recycling types	[1]	Document describes strategy to increase recycling [1]	Work Required [Ensure strategy also discusses prevention options]
	Batteries	[1]	Partnership arrangements with third party organisations to collect batteries from the recycling banks located on four main housing estates and public locations e.g. libraries[1]	Work Required [Consider how effective this approach is, and ensure rationale is in place for not implementing near entry or doorstep collections]
	Soil		Likely to be received mainly at HWRCs in neighbouring council	N/A
	Wood		Likely to be received mainly at HWRCs in neighbouring council	N/A
	Textiles	[1]	Partnership arrangements with	Work

Descriptor	Sub-Descriptor	Document	Description	Rating
			third party organisations to collect textiles from the recycling banks located on our four main housing estates [1]	Required [Consider how effective this approach is, and ensure rationale is in place for not implementing near entry or doorstep collections]
	Clinical		Corporation provides a free clinical waste collection service to residents	Work Required [Determine how clinical waste is treated, and confirm this is in line with waste hierarchy]
Evidence of actions taken to apply the waste hierarchy	Prevention/reduction		Details provided in Table 3-1	Work Required [Ensure clear forward programme of work is in place]
	(Prep for) Reuse		Details provided in Table 3-1	Work Required [Ensure clear forward programme of work is in place]
	Recycling		Details provided in Table 3-1	Complete
	Energy recovery	[1]	EfW facility became fully operational in 2011. Percentage of waste landfilled fell from 75 to 21% between 2010 and 2011 [1]	Complete

A.1.1.2 Waste Hierarchy Data

Table A - 2: Data Required for Waste Hierarchy Compliance Evaluation

Descriptor	Sub-Descriptor	Data and Source	Rating
Do you hold waste composition data?	Residential	[3,8]	Complete
	HWRC	N/A	N/A
	Bring sites	N/A	N/A
Have you quantified the impact on waste arisings of:	Waste prevention activities		
	Preparation for reuse		
Do you hold details of the tonnage of each material sent for:	Recycling	[14a,b]	Complete
	Energy recovery	[3]	Work Required [Establish fate of clinical waste, seek information on composition of residual waste to establish effectiveness of recycling system in diverting recyclable materials]
	Disposal	[3]	Complete

A.1.2 Separate Collections Checklist

A.1.2.1 Key Data Regarding Waste Service: Collections

Table A - 3: Key Data Regarding Current Collection System

Descriptor	Sub-Descriptor	Data and Source	Rating
Demographics	Households served	6,500	Complete
	Households in rural areas	0	Complete
	Households in private blocks	2400	Complete
	Other properties with very limited storage	6500	Complete
	Other households that present particular collection issues	850	Complete
Is your domestic collection system:	Co-mingled?	YES [1]	Complete
	Do you separately collect:		
	Glass?	NO	N/A
	Metal?	NO	N/A
	Paper/card?	NO	N/A
Do you also collect waste from any other sources?	Plastic?	NO	N/A
	e.g. Commercial	NO	N/A
	e.g. Bulky	YES [1]	Complete
	e.g. Bring sites	YES [1]	Complete
	e.g. HWRCs	NO	N/A
How is your current collection service provided	e.g. Streets and Litter	YES [1]	Complete
	In house	NO	N/A
	Outsourced	YES [1]	Complete
	Standard RCV (Refuse)	1	Complete
	Standard RCV (Recycling)	1	Complete
	Standard RCV (Food waste)	1	Complete
	Dry recycling doorstep van	1	Complete
	Standard RCV (residual Saturday, shared with	1	Complete

	Commercial)		
	Time-banded residual (shared with commercial 3.5-7.5t cage or alternative)	1	Complete
Please specify the containers that are typically issued to households	Refuse	850 households receive free residual waste bags Other properties have communal bins (from 240L to 1100 L)	Complete
	Recycling	Free clear recycling bags to all properties "All other properties have communal bins; ranging from 240ltr to 1100ltr dependent on property/bin store"	Complete
	Food	5L internal caddy and bin liners	Complete
	Other	850 properties do not have a bin store, and receive evening collection service 6 days week Privately managed flats and all estates have communal co-mingled bins	Complete
How many households have non-standard receptacles?	850		Complete
What is the full annual net cost of your collection system?	Outsourced		Complete
Are any significant collection service changes planned?	NO		Complete

A.1.2.2 Disposal

Table A - 4: Basic Information Regarding Current Disposal/Treatment Arrangements

Descriptor	Sub-Descriptor	Data and Source	Rating
Where do you initially tip...	Refuse	Walbrook Wharf, 79 – 83 Upper Thames Street, London, EC4R 3TD	Complete
	Dry Recycling	Southwark IWMF 43 Devon Street SE15 1AL	Complete
	Food Waste	Southwark IWMF 43 Devon Street SE15 1AL	Complete
	Garden Waste	N/A	N/A
Do you use a MRF to separate any materials that are collected co-mingled?		Southwark IWMF 43 Devon Street SE15 1AL	Complete
Do you send any material for energy recovery (this includes material from MRFs)		All residual to Riverside Resource Recovery, Belvedere, Bexley	
What are your gate fees/income for:	Refuse (including landfill tax)	£120.97 (increases by RPI each year. Contract until 2025)	Complete
	Dry Recycling	£3 per tonne	Complete
	Food Waste	£68	Complete
	Other materials	Clinical (£566.91)	Complete
Do you receive any recycling credits or avoided disposal payments or tipping away fees for material diverted?		No	N/A
What is the full annual cost of your disposal/treatment system?		£500,000	Complete
Are any significant disposal/treatment changes planned?		No. Recently initiated the services of a new MRF.	Complete

A.1.2.3 Separate Collection Checklist: Written Evidence of Policies and Decisions

Table A - 5: Additional Written Evidence of Policies and Decisions Required for Separate Collection Compliance Evaluation

Descriptor	Sub-Descriptor	Description	Rating
Have you made any assessment of	whether separate collection of the four materials would lead to an increase in quantity of recyclate collected	None	Absent
	whether separate collection of the four materials would lead to an increase in the quality of recovery (more, or better recycling)	None	Absent
Technical practicability	Have you looked at how separate collection could be implemented for hard to serve households (e.g. other authorities' best practice)?	None	Absent
Economic practicability	Have you undertaken a comparison of the full costs to the Corporation (including the benefit of material incomes) of separate vs co-mingled collection?	None	Absent
Environmental Practicability	Have you undertaken a comparison of the environmental impact of separate vs. co-mingled collection, including, for example, energy use in haulage and MRF operations?	None	Absent

Table A - 6: Additional Data Required for Separate Collection Compliance Evaluation

Descriptor	Description	Rating
If you have contracted out collection or disposal/ treatment work, what assessment has been made of the costs of breaking or amending the contract?	A new memorandum of understanding with Amey would be required; there would be a cost to this, but as yet unknown.	Work required
Do you hold information regarding the outputs from any MRF that you use, including details of rejects and of the purity of the outputs?	The MRF contract is new, and information has not yet been received	Work Required
Do you hold any information regarding the end destination of material that is sent through the	List of reprocessors has been supplied by MRF. but could usefully be supplemented with	Complete

MRF?	details of quantities of each material to closed loop uses [15c]	
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Table A - 7: Comparative Information on Separate Collection

Descriptor	Sub-Descriptor	Evidence	Rating
What assessment has been made of the comparative number/cost of the following items for separate collection?	Vehicle requirements	None	Absent
	Crew requirements	None	Absent
	Depot costs	None	Absent
	Likely diversion rate	None	Absent
	Containers	None	Absent
	Material gate fees and disposal costs	None	Absent

A.2.0 Additional Tables

A.2.1 Materials

Table A – 8: Breakdown of Material Tonnages (Tonnes)

Material	Baseline – Co-mingled	Option 1 – Separate Collection	Option 2 – Separate Paper
Co-mingled	808		
Mixed Containers			341
Mixed Paper & Card		385	427
Glass		145	
Plastic		76	
Steel		19	
Aluminium		7	
Total Dry Collected	808	632	768
MRF Rejects	65	5	31
Food Waste	96	96	96
Residual Waste	1,520	1,691	1,595

Table 9 – Modelled Gate Fees and Material Incomes (£)

Material	Gate Fee
Co-mingled	3.00
Mixed Containers	3.00
Mixed Paper and Card	-50.00
Glass	-15.00
Plastic	-90.00
Steel	-95.00
Aluminium	-750.00
Food Waste	68.00
Residual Waste (inc. LFT)	120.97

Note: Negative gate fees represent an income.

Table A – 10: Breakdown of Material Incomes (£s)

Material	Baseline – Co-mingled	Option 1 – Separate Collection	Option 2 – Separate Paper
Co-mingled	2,425	0	0
Mixed Containers	0	0	1,023
Mixed Paper and Card	0	-19,265	-21,342
Glass	0	-2,179	0
Plastic	0	-6,822	0
Steel	0	-1,776	0
Aluminium	0	-4,924	0

A.2.2 Carbon Factors

Table A – 11: Breakdown of Carbon Factors (Tonnes of CO₂ emitted/saved)

Material/Activity	CO ₂ Impact
Single Stream	-0.35
Containers Only	-0.61
Mixed Paper & Card	-0.34
Glass	-0.20
Plastic	-1.17
Steel	-1.83
Aluminium	-8.70
MRF Glass	-0.07
Food Waste	-0.16
Diesel fuel (litre)	0.0003
MRF operation (per tonne of material processed)	0.02

Note: All figures are based on savings per tonne of virgin material replaced, except as indicated.

A.3.0 Documents Referenced

The table below presents a comprehensive list of data and written evidence of policies and decisions, provided by the Corporation, which would be needed to demonstrate compliance with the Regulations. These documents are referenced to numerically in the report.

Table A - 12: List of Data and Documentation Required for Compliance Check

Document No.	Document Name
1	Final Waste Strategy April 2014 – 2013-2020
2	Confirmation of CoL Service data and additional queries and replies
3	MRF composition summary 2013-14
4	Bulky Reuse Collection Service
5	Park and Open Spaces FAQ
6	City of London Bulky Waste Report
7	Give and Take Days
8	Composition Analysis
9	Bike Swap Confirmation
10a	Restart Pop-Up for Recycling Week
10b	Restart Promotion Plan
10c	Restart Booking Plan
11	Street Sweeper Data
12	LFHW Funded Activities 2013-14
13	Potential Bulky Items Recycling
14a	Waste Collection 2013-14
14b	Waste Collection 2014-15
15a	Final Destination 2013b – Ideal
15b	Final Destinations – Ideal
15c	Final Destinations – Veolia MRF November 2014
Web	City of London Corporation Website

A.4.0 Key Recommendations

A.4.1 Regulation 12: Waste Hierarchy

Recommendation 1: The Corporation may wish to produce and maintain an overview, based on

Table 3-1, to evidence the actions carried out to implement the waste hierarchy and the rationale for their selection.

Recommendation 2: The Corporation may wish to ensure that it has a clear timetable in place showing planned actions relevant to the waste hierarchy.

Recommendation 3: The Corporation may wish to put in place documents that explain its rationale for incineration of certain material streams or state why it is not reasonable to take action to move these materials further up the waste hierarchy.

Recommendation 4: An analysis of the impact of waste prevention and reuse measures would provide the Corporation with further evidence of the effectiveness of the actions they have taken to apply the waste hierarchy; if this is not deemed feasible, the Corporation should record the reasons why.

A.4.2 Regulation 13: Separate Collection

Recommendation 5: Further work to obtain actual MRF output data would allow a reassessment of whether separate collection is necessary in order to improve recovery. The Corporation will need to reach a view on what it considers to be “high quality recycling”.

Recommendation 6: In the context of this options appraisal, the Corporation should consider what level of expenditure on waste services is affordable, and what would qualify as “excessive cost”.

Recommendation 7: The Corporation may wish to assess the extent to which its contract with Amey can be exited or amended. If this cost is excessive, then this might constitute a further reason for deferring any change until procurement of a new contract is due in 2019.

Recommendation 8: The Corporation may now wish to gain appropriate internal sign-off for the proposition separate collection is necessary, technically practicable and environmentally practicable; to decide whether the additional costs and inherent financial risk amounts to making it not economically practicable, by virtue of representing an ‘excessive cost’; and to decide if there are financial reasons why a transition to a separate collection system might in any case not be feasible in the short term.