

Review of Herefordshire and Worcestershire JMWMS Residual Options Appraisal

Report

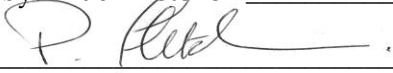
November 2012

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For and on behalf of Environmental Resources Management
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1 REVIEW OF HEREFORDSHIRE AND WORCESTERSHIRE JMWMS RESIDUAL OPTIONS APPRAISAL

1.1 INTRODUCTION

In 2009, ERM supported Worcestershire County Council (WCC) and Hereford Council (HC) on the review of their Joint Municipal Waste Management Strategy. Part of this work involved undertaking a Residual Waste Options Appraisal, the purpose of which was to help guide and inform future strategic decisions regarding the treatment of residual municipal waste.

Given that three years have now elapsed since the Options Appraisal work was undertaken, WCC and HC would like ERM to reference check key assumptions used within the assessment to ensure their continued validity and appropriateness. However, a full formal reassessment of the appraisal is not appropriate at this time.

The original assessment considered a range of alternative technologies in the option development process. It was necessary within this review therefore to check whether any new technologies had become available since the original assessment was undertaken.

Each of the Social, Financial and Risk Criteria has been reviewed individually, and where any assumptions have changed, the impact on the overall results and conclusions has been evaluated.

The Environmental Criteria have not been revisited at this time. The original assessment of the environmental criteria was completed using WRATE Version 1. In April 2010 WRATE Version 2 was issued. It would be possible to re-run the assessment using the new version of the software. However, although a re-run may change some of the specific output values, any changes to the set of options would be minor and the relative performance of the options would not change. There is therefore no value in carrying out a re-run of the appraisal against environmental criteria.

1.2 REVIEW OF OPTION

As part of the original assessment, options were developed using a two-step process. The first step involved listing the full range of technology options available for the treatment of residual municipal waste. This list has been reviewed to ensure that no new technologies have been identified since the original assessment was undertaken.

The second stage involved developing a short list of options to ensure only those technologies which would be able to deliver the objectives of the Strategy were considered. On reviewing this process, it is considered the exclusion of mass burn incineration and plasma arc technology is still appropriate and that no new technology options have become available for consideration.

1.3 SOCIAL CRITERIA

1.3.1 Health

The method used for assessing impacts on health was to quantify the human toxicity potential of the options using a series of characterisation factors which describe fate, exposure and effects of toxic substances for an infinite time horizon. WRATE is also used to compare the different options against this criterion.

The results showed that the majority of options have a beneficial impact on human health. This is due to the avoided health impacts associated with increased recycling and the offsetting of burning fossil fuels. The results from this assessment are indicative and are based on an impact assessment method from *CML (1999) Problem oriented approach HTP inf. (Huigbregts, 1999 & 2000)*.

Any technologies that were to be procured by the Partnership would need to adhere to strict EA emission standards and as such the impacts highlighted in this assessment are within those standards. In February 2010, the Health Protection Agency published updated advice on the health impacts of emissions from municipal waste incinerators. In it, the Health Protection Agency reviews research undertaken to examine the suggested links between emissions from municipal waste incinerators and effects on health. While it is not possible to rule out adverse health effects from modern, well-regulated municipal waste incinerators with complete certainty, any potential damage to the health of those living close-by is likely to be very small, if detectable. This view is based on detailed assessments of the effects of air pollutants on health and on the fact that modern and well-managed municipal waste incinerators make only a very small contribution to local concentrations of air pollutants. The HPA notes that the Committee on Carcinogenicity of Chemicals in Food, Consumer Products and the Environment has reviewed recent data and has concluded that there is no need to change its previous advice, namely that any potential risk of cancer due to residency near to municipal waste incinerators is exceedingly low and probably not measurable by the most modern techniques. The HPA concludes that since any possible health effects are likely to be very small, if detectable, studies of public health around modern, well-managed municipal waste incinerators are not recommended.

Up to April 2011, the HPA was not aware of any evidence that required a change in its position statement.

However, in January 2012 the HPA issued a statement saying that, while its current position that well-run and regulated modern municipal waste incinerators are not a significant risk to public health remains valid, it recognises that there are public concerns about this issue and so a new study is being carried out to extend the evidence base and to provide further information to the public on this subject. The study began in April 2012, but is not due to report preliminary results until March 2014. Therefore there is no significant new evidence which has emerged since the previous options appraisal work was undertaken by ERM, and so the conclusions at that time remain unchanged.

1.3.2 *Transport*

In our previous report, the assessment of transport distances was based on an assumption about potential locations of facilities, as no exact locations were known at that time. Following an application for a scoping opinion from Worcestershire County Council, we then undertook a sensitivity analysis to show the effect of a known location on the transport assessment. This showed that in all cases where a change in impact is discernible, the impact has increased slightly. However, the percentage change was very small and the ranking of the options was unchanged. Furthermore, the location was Hartlebury Trading Estate, where planning permission has now been granted. Therefore, the conclusions drawn in the original Residual Options Appraisal remain valid.

1.4 *FINANCIAL AND RISK CRITERIA*

1.4.1 *Costs*

The costs in this assessment are not necessarily indicative of actual costs currently being incurred for ongoing contracts but do provide representative costs for comparison of the technologies being considered here for new contracts.

CAPEX and OPEX have been established from a review of publically available sources and by obtaining information directly from operators of existing facilities. There is little new information available on typical capital and operational costs of waste management facilities since the previous report in July 2009, therefore the capex and opex figures remain unchanged from the previous report.

However, new data is available on current gate fees for various types of facilities and landfill tax. These data have been revised from our previous assessment, and the table below gives estimates of the cost of hazardous and non-hazardous landfill.

Table 1.1 Gate Fees and Landfill Tax

	Current (£ per tonne)
Landfill gate fee	21 ¹
Hazardous landfill gate fee	156 ²
EfW gate fee	82 ¹
Landfill tax	64 ¹

Notes

¹ Source: WRAP Gate Fees Report 2012

² Source: *Assessment of the Options to Improve the Management of Bio-Waste in the European Union*, Arcadis et al, November 2009

Each option will have an overall cost to the Partnership. The following table does not provide an accurate projection of the actual charges to the Partnership, but allows over the project lifetime (25 years) the different options to be compared. The costs in *Table 1.2* include the costs associated with the disposal of residues from the facilities for each option. There are no additional costs for option G as it is assumed that all costs are incorporated into the gate fee for this facility. The capital cost and operating costs of a Waste Transfer Station with a capacity of 110K tpa is included in option G. Transportation costs and potential income from heat, energy and recycle are not included in these figures.

Table 1.2 Option Costs (£million)

Option	CAPEX	OPEX	Landfill costs	Haz landfill costs	Landfill tax	Total	Rank
A	74	101	0	14	6	195	1
B	118	113	0	14	6	251	5
C	65	244	12	0	38	359	7
D	62	229	12	0	38	341	6
E	56	143	8	0	23	230	2
F	56	143	8	0	23	230	2
G	4	227	0	0	0	231	4

1.4.2 Reliability of Delivery

To get financial backing for a waste management facility, there needs to be security for the lender that the technology proposed can work on the scale proposed in the bid. It is often harder to secure financial backing for facilities that have not been proven in the UK, that have not been shown to work at large scale, or which have only been used on feedstock with different characteristics from the intended waste stream.

To assess reliability of delivery, the options appraisal assigned scores on the basis of whether a plant has already been operational at a large or small scale, and in the UK or in Europe.

Table 1.3 *Points Attributed to Proven Technologies*

Development status	Score
Proven on a large scale in the UK	4
Proven on a large scale in Europe	3
Proven on a small scale in the UK	2
Proven on a small scale in Europe	1

*A large scale plant is a plant greater than pilot or experimental scale

All of the options assessed are of a reasonably proven nature. Only two options did not score the top score of 4 for being proven on a large scale in the UK at the time the first appraisal was carried out, and these were options E and F (one or two autoclaves). At the time, there was only one autoclave in Rotherham operated by Sterecycle with a capacity of 100,000 tpa, and therefore the technology could not be said to be proven on a large scale in the UK.

The Rotherham facility has now gone into receivership, raising questions about the viability of the technology, therefore the score for the two autoclave options on reliability has been lowered. However, this does not change the ranking of the options.

Table 1.4 *Option Scores*

Option	Proven Technologies Score	Rank
A	4	1
B	4	1
C	4	1
D	4	1
E	1	6
F	1	6
G	4	1

*A large scale plant is a plant greater than pilot or experimental scale

1.4.3 *Planning Risk*

One of the greatest risks to any waste facility project is planning. The development of this assessment has compared the options in terms of number of sites required for each option. Options therefore fall into three categories; one site options (A, B and E), two site options (C, D and F) and the export option (G).

The two site options are considered to incur the greatest risk. To ensure the JMWMS is successfully delivered, the authorities would need both sites to be

successful through the planning process. For this reason the one site options are considered to have less planning risk associated with them.

Option G, the export option, assumes the designated facility is already established and thus the delivery of this option does not rely on obtaining additional planning permissions. This option however does incur an additional risk in relation to availability of spare capacity out of county.

Planning permission has been granted for an EfW facility which is CHP-enabled at Hartlebury in Worcestershire. Therefore, option A is considered low planning risk. Although the permission is for a CHP-enabled facility, additional planning permission is likely to be required for pipework and connections off site and there this option has been awarded a slightly higher risk.

Table 1.5 *Planning Risk Rankings*

Option	Description	Planning Risk Ranking
A	One site EfW	1
B	One site CHP	3
C	Two site MBT (on site burning)	5
D	Two site MBT (off site burning)	5
E	One site Autoclave	4
F	Two site Autoclave	5
G	Out of County EfW	1

1.4.4 *Compliance with Policy*

This criterion assesses the ability of each of the options to manage waste in accordance with national waste policy. Government policy seeks to drive the management of waste up the waste hierarchy.

ERM compared the options based on the tonnages of material handled by each of the following management methods:

- the amount of waste landfilled;
- the amount of mass lost during treatment;
- the amount of waste used to generate electricity;
- the amount of waste used to generate heat; and
- the amount of waste recycled.

The score for each option was determined by multiplying the relative tonnages for each management method by a weighting factor to represent the preference for each of these in the waste hierarchy.

The tonnages of waste managed at different levels of the waste hierarchy has not changed for any option, and therefore the assessment for compliance with policy is unchanged from the previous iteration of the options appraisal.

1.4.5 *Flexibility*

The options were assessed for their flexibility in terms of ability to accept waste with differing compositions arising from seasonal variations, potential changes to packaging material etc, and on their ability to adjust to variations in tonnages of waste throughputs.

This criterion was assessed qualitatively by ERM, using professional judgement based on our knowledge of the different technologies and experience of previous technical options appraisals.

The technologies have not changed to a significantly large degree that would alter the previous assessment of flexibility, therefore the previous rankings on flexibility remain unchanged.

1.4.6 *End Product Liability*

This criterion considers the risks associated with finding a market for the end products arising from the technologies. Some waste management technologies have greater risks associated with the management of end products because the markets for these materials are unproven or under-developed.

ERM compared the options based upon the tonnages of each material end product arising from the technologies involved in each option. The end product(s) from each technology have been assigned a coefficient based on the risks associated with finding a market for them. These risks have been based on ERM's knowledge and experience of the secondary materials market.

A high liability coefficient has been attached to RDF produced by treatment technologies for combustion off-site because there is still uncertainty about the availability of markets. While some RDF producers have recently secured contracts to supply RDF to customers overseas, there is still market instability in the UK, with cement production continuing to experience low growth, and some restructuring within the cement industry with mergers and plant closures.

The ban on co-disposal of hazardous waste with non-hazardous waste in the UK has severely reduced the number of landfill sites licensed to accept hazardous waste. However, there is a landfill site capable of accepting hazardous material in operation approximately 60 km from the proposed sites. The disposal of hazardous waste to landfill has been ranked as medium

risk, as any problems at this landfill would require significant extra transport to the next nearest hazardous landfill site.

It is assumed that the EfW and EfW+ CHP options (options A&B) would only be developed on sites with suitable and secure outlets for the heat and/or electricity produced and therefore these outputs have not been included in this assessment.

The above assessment of markets for end products means that the end product liability coefficients assigned to the different types of products remain the same as in the previous assessment and therefore the ranking of options is unchanged for this criterion.

1.5

RESULTS

The following table shows the rankings for all criteria, updated to reflect the conclusions in the above analysis. This shows that, while the rankings have changed for some individual criteria, this has made only a small change to the average of all the rankings. However, it is worth noting that the overall ranking of the different options has changed slightly. Option B, Energy from Waste with CHP, remains the highest ranking of all the options, but option A, Energy from Waste without CHP is now the second highest ranking. Option E, single autoclave, has slipped into third place. The ranking for all other options is unchanged.

Table 1.6

Total Updated Scores and Ranks

Option	Resource Depletion	Global Warming	Ecotoxicology	Acidification	Eutrophication	Health	Transport	Cost	Reliability	Planning Risk	Compliance with Policy	Flexibility - composition	Flexibility - tonnage	End Product Liability	Average	Rank
A	3	6	7	6	5	4	1	1	1	1	5	1	2	1	3.14	2
B	2	1	6	5	3	3	1	5	1	3	1	1	2	1	2.50	1
C	4	5	1	4	4	5	3	7	1	5	7	6	1	5	4.14	5
D	1	4	4	3	6	6	4	6	1	5	6	6	6	3	4.36	6
E	6	2	2	1	1	1	5	2	6	4	2	4	4	6	3.29	3
F	7	3	3	2	2	2	7	2	6	5	2	4	4	6	3.93	4
G	5	7	5	7	7	7	6	4	1	1	4	1	7	4	4.71	7

KEY:

Option A	1 x EFW
Option B	1 x EFW + CHP
Option C	2 x MBT - gasification
Option D	2 x MBT - cement kiln
Option E	1 x Autoclave
Option F	2 x Autoclave
Option G	EFW out of county

