West London Waste Plan

Hazardous Waste Assessment

Final Issue

Version: 1.0

Issued: 27th February 2014

BPP Consulting Document Control

Project: West London Waste Local Plan

Report: Hazardous Waste Assessment

Version Description: Final Issue

Version No.: 1.0

Date:27th February 2014

Version No.	Version Description	Author	Date	Reviewer	Date
0.1	Draft for Internal review	Ian Blake		Alan Potter	
0.2	Draft for internal review	Alan Potter	25.02.14	Ian Blake	25.02.14
0.3	Draft for internal review	Alan Potter	26.02.14	Ian Blake	26.02.14
1.0	Final Issue	Alan Potter	27.02.14	Ian Blake	

Inquiries about this report should be directed to BPP Consulting at

info@bppconsulting.co.uk or Tel 01342 825300.

Table of Contents

List of Tables

Table of Figures

Appendices

1. Executive Summary

Hazardous wastes are categorised as those that are harmful to human health, or the environment, either immediately or over an extended period of time. They range from asbestos, chemicals and oil, through to electrical goods and certain types of healthcare waste.

Hazardous waste generated in West London is a significant waste stream requiring a range of specialist facilities for its management.

In 2012, West London produced just over 88,000 tonnes of which approximately 85% was exported for management. At the same time 20,000 tonnes was imported from outside the Plan area. West London boroughs exported hazardous waste to 38 different destinations across England, with the main ones being Northamptonshire, Hertfordshire, Surrey and Kent. Overall the Plan Area achieved 40% net self sufficiency in 2012.

It has been established that within the Plan area there is a moderate level of capacity for the management of hazardous waste. Other flows have been tracked with the general finding being that waste of this type travels for up to 2.5 hours of the Plan area for management. These flows have been subject to further investigation under the Duty to Co-operate requirements to confirm continued availability for the Plan period. It is not anticipated that substantial additional need for new capacity locally will be identified which would require specific identification of sites in the Plan.

2. Introduction

What is Hazardous Waste?

The term "hazardous waste"[1] is used to describe waste with hazardous characteristics in line with the List of Wastes (LoW) Regulations. Certain types of waste are classed as hazardous because they are considered to possess properties that pose a threat to human health or the environment such as toxicity, flammability, corrosiveness and carcinogenic. The 'List of Waste' identifies waste that are either definitively hazardous, may be hazardous by virtue of their particular properties, and are not hazardous. Specification of thresholds of potentially hazardous properties (hazardousness) is provided by guidance produced by the Environment Agency which also includes testing methods. [2]

Hazardous waste is most helpfully described in Defra's 'Strategy for Hazardous Waste Management in England' as follows:

"Hazardous waste is waste that may cause particular harm to human health or the environment. Such wastes contain one or more hazardous properties. The European Commission defines hazardous waste and such wastes are currently asterisked in the European Waste List (Commission Decision 2000/532/EC). The list is subject to periodic review by the European Commission. Some everyday items such as computer monitors, TVs, refrigeration equipment and some batteries may be hazardous waste as well as more obvious materials such as asbestos and oil. Hazardous waste therefore comes from a wide range of sources, including households, businesses of all types, and public services, such as the health service, schools and universities."

[1] In general; waste classified as radioactive waste is regulated under separate legislation

[2] Technical Guidance WM2 - Interpretation of the definition and classification of hazardous waste (3rd Edition, August 2013)

3. Study Context

The 2011 Preferred Sites and Policies Consultation version of the West London Waste Plan (WLWP) made no specific provision for hazardous waste on the basis that it is not required to do so by the London Plan and it should be planned for on a regional basis – the position taken is set out below:

"The preferred approach is therefore to make no specific provision for hazardous wastes within the Plan; however, planning applications for hazardous waste facilities will be treated in the same way as applications for all waste management facilities and the capacity of hazardous waste facilities will be monitored closely to establish whether additional provision is required at a later date."

In reaching the position in the 2011 draft Plan, consultation had previously taken place on Issues and Options (I&O) (in 2009) which had invited views on the following options for hazardous waste:

1. Include capacity provision to manage hazardous waste arising; or
2. Assume hazardous waste is managed elsewhere and make a small provision for what may be need to be treated or disposed of; or
3. Make no provision for hazardous wastes (this is assumed to represent the 'no change' option).

At the same time it was suggested that 13% of hazardous waste produced in west London was managed in London with the rest being managed elsewhere (It isn't stated how much was believed to have been managed in west London).

The supporting Sustainability Appraisal considered the above three options. Due to the lack of data it made the baseline assumption that all hazardous waste was being exported for management outside west London. While the appraisal found that option 1 above was the most preferable, difficulties with the appraisal were noted due to the lack of data, in particular the following:

- The need to define the existing baseline more clearly to allow effective appraisal
- Clarification is needed for the amount of waste to be provided for
- Current arisings of hazardous waste need to be determined along with detail regarding current management methods and distances travelled
- Consider whether it is economically viable to make provision for a small amount of hazardous waste
- The implications of transporting all hazardous waste out of West London need to be quantified

Comments expressing concern with the position taken in the 2011 Proposed Sites and Policies document were received, in particular from the Environment Agency and Surrey County Council, with both suggesting that the Plan should actively plan for the management of hazardous waste arising in West London.

National policy recognises that the combination of the specialist nature of hazardous waste facilities and the relatively small quantities generated within a particular Plan Area mean that hazardous waste is more usually managed at facilities serving a wide catchment.

The purpose of this study is to review hazardous waste production and management in west London, taking into account the concerns regarding the availability of evidence raised in the I&O SA recommendations.

4. Hazardous Waste Policy & Regulatory Context

4.1. National Policy

In guidance on the implementation of the EU Waste Framework Directive, DCLG clearly states its expectation that WPAs should plan for the sustainable management of hazardous waste[3].

The national policy context for the management of hazardous waste in England is summarised in the 'Waste Management Plan for England December 2013'[4] as follows:

"The Government's Strategy for Hazardous Waste Management in England[5] sets out the Government's vision for improved hazardous waste treatment. The Strategy aims to continue to encourage policies which lead to reductions in hazardous waste arisings, and the wider application of the waste hierarchy to the management of hazardous waste.

We anticipate that associated hazardous waste management practices and new infrastructure will meet existing regulatory requirements, including those of the revised Waste Framework Directive and the Landfill Directive. This will help to secure environmentally sound management of hazardous waste. The hazardous waste management Strategy includes information on how some key hazardous wastes are managed. It includes an annex listing the priority facilities required. In addition, guidance has been developed on applying the waste hierarchy to hazardous waste to encourage further the provision of key infrastructure.

Furthermore, under the Planning Act 2008, Defra published in June 2013 a National Policy Statement for Hazardous Waste in relation to the development of nationally significant hazardous waste infrastructure. The Statement sets out the strategic need and government policy context for the provision of such infrastructure. It will be used to guide decisions by the Planning Inspectorate but also will provide guidance to developers. "

[3] Guidance for local planning authorities on implementing planning requirements of the European Union Waste Framework Directive (2008/98/EC), DCLG, December 2012

[4] https://www.gov.uk/government/publications/waste-management-plan-for-england

[5] http://archive.defra.gov.uk/environment/waste/topics/hazwaste/documents/policy.pdf.

The objectives of government policy on hazardous waste are included in the National Policy Statement for Hazardous Waste as follows:

> The main objectives of Government policy on hazardous waste are:
>
> **(a) To protect human health and the environment** – stringent legislative controls are in place to control the management of waste with hazardous properties;
>
> **(b) Implementation of the waste hierarchy** – to produce less hazardous waste, using it as a resource where possible and only disposing of it as a last resort;
>
> **(c) Self-sufficiency and proximity** – to ensure that sufficient disposal facilities are provided in the country as a whole to match expected arisings of all hazardous wastes, except those produced in very small quantities, and to enable hazardous waste to be disposed of in one of the nearest appropriate installations;
>
> **(d) Climate change** – to minimise greenhouse gas emissions and maximise opportunities for climate change adaptation and resilience.

The Government's strategy for the management of hazardous waste is set out in the Strategy for Hazardous Waste Management in England, March 2010. This is summarised in the more recent (June 2013) National Policy Statement[6], which considers the principles included in the Strategy insofar as they relate to the provision of infrastructure, as set out below:

> 2.4.1 The Waste Strategy for England, published in 2007, identified infrastructure and capacity needs for the treatment and disposal of hazardous waste. To take this forward, and to underpin the practical application of the revised Waste Framework Directive, Defra published a Strategy for Hazardous Waste Management in England in March 2010[17]. This includes a set of six high level principles for the management of hazardous waste, intended to drive the management of hazardous waste up the waste hierarchy and to more sustainable management. Five of these principles are of particular relevance to the need for new infrastructure:
>
> - **Principle 1** requires hazardous waste to be managed to provide the best overall environmental outcome – expected to be in line with the waste hierarchy, except where life cycle analysis indicates that (exceptionally) the best overall environmental option would require a departure from that hierarchy.
> - **Principle 2** requires a reduction in reliance on landfill, with landfill only being used where, overall, there is no better recovery or disposal option.
> - **Principle 3** requires that hazardous waste is not mixed with different categories of hazardous waste or with other waste substances or materials (although co-disposal of some wastes in landfill is allowed).
> - **Principle 4** requires that organic hazardous wastes that cannot be reused, recycled or recovered shall be subject to destruction using best available techniques, with energy recovery for all appropriate treatments. No hazardous organic waste is to be landfilled unless the requirements of the Landfill Directive are met.
> - **Principle 5** the practice of relying on higher Landfill Directive waste acceptance criteria to enable some hazardous waste to continue to be landfilled must end.

[6] https://www.gov.uk/government/publications/hazardous-waste-national-policy-statement

Hazardous Waste and the Waste Hierarchy

As stated above there is an expectation that hazardous waste will be managed in accordance with the waste hierarchy. The need for this is enshrined in legislation set out in the Waste (England and Wales) Regulations 2011. Regulation 12 of these regulations requires producers of all types of waste to formally declare that they have taken all reasonable measures to prevent the waste arising in the first place and taken the hierarchy into account when transferring their waste for management.

To support implementation of the Regulations and recognising the problematic nature of hazardous waste the Government has produced specific guidance on the application of the waste hierarchy to hazardous waste[7]. This includes four decision trees to help waste producers understand how to apply the waste hierarchy to organic wastes[8], inorganic wastes[9], waste articles and wastes which are classed as mixed[10]. These decision trees may be used to demonstrate circumstances where it might be more appropriate to depart from the waste hierarchy in order to achieve the 'best overall environmental outcome'. The decision trees can also be used to select the most appropriate waste management option for certain types of hazardous waste.

[7] Guidance On Applying The Waste Hierarchy To Hazardous Waste November 2011 https://www.gov.uk/government/publications/guidance-on-applying-the-waste-hierarchy-to-hazardous-waste

[8] Organic wastes are those that predominately contain covalently-bonded carbon compounds usually in association with hydrogen, such as methane but also in association with halides such as tetrachloromethane. Some carbon compounds such as graphite, carbides, carbonates, cyanides are classified as inorganic.

[9] Inorganic wastes are generally salts, consisting of cations and anions joined by ionic bonding.

[10] Mixed wastes are wastes that could be separated to facilitate further treatment.

Regional Policy (the London Plan)

Policy 5.19 of the London Plan (2011) states that the Mayor will prepare a Hazardous Waste Strategy for London and will work in partnership with the boroughs, the Environment Agency, industry and neighbouring authorities to identify the capacity gap for dealing with hazardous waste and to provide and maintain direction on the need for hazardous waste management capacity. This policy also directs that existing hazardous waste sites should be safeguarded unless compensatory provision is made. In January 2014 the Mayor released a report[11] to help inform London's hazardous waste management capacity requirements and planning policy for the next iteration of the London Plan, due for publication (adoption) in 2015. This study is a non-statutory document and sets out the Mayor's understanding of London's hazardous waste management arrangements. It also presents a number of recommendations the most relevant of which are summarised below:

1. Identify suitable sites to manage hazardous waste in London. It recommends that London waste planning authorities (WPAs) identify suitable sites for hazardous waste management in their waste development plans to fulfil London Plan apportionment policy.
2. Monitor the capacity of waste management facilities (including landfill) accepting London's hazardous waste.
3. Review the potential to divert London's hazardous waste to reuse, recycling or other forms of recovery in London.
4. Review the types and amounts of London's hazardous waste that could be most effectively and easily collected for reuse and recycling to inform the potential for developing new hazardous waste management facilities in London

[11] London's Hazardous Waste A Report For The Mayor Of London, January 2014

5. Hazardous Waste Arisings & Management in west London

Current Arisings

The amount of hazardous waste produced in west London has been assessed using information obtained from the following 5 data sets:

1. The Environment Agency (EA) Hazardous Waste Interrogator 2012 - movements.
2. The EA Waste Data Interrogator 2012 – inputs to waste facilities.
3. The EA Waste Data Interrogator 2012 – outputs from waste facilities.
4. The EA Pollution Inventory Site input data 2012
5. Wastedataflow Returns 2012

5.1. The EA Hazardous Waste Interrogator (HWI) 2012

This indicates the following results:

1. In 2012 37,476 tonnes of hazardous waste was produced in west London;
2. Of this 3,992 tonnes were dealt with in west London.
3. In addition, 20,304 tonnes of waste was imported to west London to be managed.

Therefore this suggests that west London is about 65% self sufficient in capacity.

It is important to note the following caveat:

The HWI dataset relies on hazardous waste consignments notes being generated by the producer of the waste that show it is being 'consigned' to a legitimate site. It is data from these records that is summarised by area in the HWI. This means that the dataset is incomplete for the following reasons:

1. Consignment notes are not issued where waste does not change hands i.e. it is managed onsite or offsite by the producer or the same operator. For example clinical waste produced and disposed of on a hospital site.

2. Certain types of hazardous waste are not always consigned by the producer to cover its movement to a treatment facility and so it may only get recorded as hazardous waste on its arrival. For example, End of Life Vehicles, which are classed as hazardous waste, will not necessarily be consigned to a vehicle de-pollution facility because the producer (the vehicle owner) may not consider it to be hazardous waste and hence it is not recorded on the HWI. However, it will be recorded as hazardous waste on arrival at the de-pollution site and recorded on the WDI as an input to the facility.

In light of this limitation with the data in the HWI, the EA WDI was also interrogated to obtain data to fill gaps.

5.2. The EA Waste Data Interrogator 2012

The EA WDI indicates the following results:

1. In 2012, 37,477 tonnes of hazardous waste was produced in west London ;.
2. Of this 10,376 tonnes were dealt with in west London.
3. In addition, 32,571 tonnes of waste was imported to west London to be managed.

This dataset suggests that west London is exceeding net self sufficiency in that more waste is being managed in West London than is being produced.

It is important to note the following caveat:
A known weakness of the WDI data is the attribution of site inputs to each WPA. This means input values are under-reported. Cross checking with HWI fills in some of these gaps. Waste received at some facilities, such as Civic Amenity Sites, is not recorded when it is delivered but will be recorded as an output via records of receipt from onward destinations. For example, old TVs which have hazardous

components[12] will be classed and dealt with as hazardous waste when sent on for treatment. Cross checking with WDI Output values fills in these gaps. Wastedataflow returns were used to verify the entries in the WDI for specific wastes that occur in the Local Authority Collected Municipal Waste stream such as TVs (CRT) and fridges.

In addition to the above, some waste management facilities do not report through the WDI but report to the EA Pollution Inventory. These are generally facilities that previously operated under PPC permits. An inquiry made of the Environment Agency revealed a significant facility in the form of the Hillingdon Hospital incinerator, with capacity of 8,000 tonnes per annum, that disposes of hazardous clinical waste. Records for removals of fly ash (which is classed as hazardous) were also accessed to gain a comprehensive picture.[13]

5.3. Integrating the Datasets

It is shown above that reliance on a single dataset would be incomplete and misleading. There is however overlap between the two so it is necessary to integrate them to provide a complete picture.

Having agreed a methodology with the Environment Agency[14], a detailed process of reconciling the two datasets was conducted to ensure that the overall dataset used is as accurate and complete as possible. Table 1 shows the combined values for hazardous waste produced in west London according to whether it is dealt with in west London ('domestic') or managed outside ('export').

[12] E.g. Cathode Ray Tubes (CRTs)

[13] Pollution Inventory returns indicates that all inputs came from Hillingdon in 2012. It also shows that 493 tonnes of ash was classed as hazardous and went predominately to East Midlands for treatment.

[14] Andrea Purdey Data and Intelligence Manager

Table 1: Hazardous Waste Arising in west London 2012

Fate	Domestic	Export	Total
Incinerator	2,125	3,333	**5,458**
Landfill		6,274	**6,274**
MRS	9,532	364	**9,896**
Recovery	625	16,323	**16,948**
Transfer	2,085	13,622	**15,707**
Treatment		34,058	**34,058**
Grand Total	**14,367**	**73,974**	**88,341**

Table 2 shows the combined values for hazardous waste managed in West London by fate/management route.

Table 2: Hazardous Waste Managed in west London 2012

Fate	Domestic	Import	Total
Incinerator	2,125	4,456	**6,581**
Landfill	0	0	**0**
MRS	9,532	16,465	**25,997**
Recovery	*625*	*12,091*	***12,716***
Transfer	2,085	16,497	**18,582**
Treatment	0	0	**0**
Grand Total	**14,367**	**49,509**	**63,876**

The combined datasets indicate the following results *(rounded to nearest 500 tonnes)*:

1. In 2012, just under 88,500 tonnes of hazardous waste was produced in west London;
2. Of this just under 14,500 tonnes were dealt with in west London.
3. In addition to this, up to[15] 50,000 tonnes of waste was imported to west London to be managed.

This dataset suggests that West London achieved between 58-72% net self sufficiency in hazardous waste management in 2012.

[15] 'up to' as the reconciliation process didn't allow sufficient resolution to have certainty that all double counting was eliminated. The import value could be between 37,500 tonnes and 49,509 tonnes.

5.4. Hazardous Waste Produced

1.1 In 2012, the HWI shows that a total of 212 different types of hazardous waste were produced in west London and managed at permitted sites both within and beyond the Plan Area. Twenty of these waste types accounted for 97% of managed quantities that were produced by 11 different sectors of activity. The main activities resulting in the production of hazardous waste in the Plan Area were found to be:

- Waste from Industrial Processes (predominantly wastes resulting from the processing of scrap vehicles ('End of Life Vehicles' (ELVs)) (33%)
- Construction and Demolition (majority classed as 'dredging spoil containing dangerous substances[16]') (30%)
- Waste associated with cleaning of site drainage systems i.e. interceptor emptyings (mainly oily water) (15%)
- Acids from treatment of metal and/or plastics in manufacturing (15%)
- Infectious healthcare waste (2%)
- Waste Electronic and Electrical Equipment (WEEE) with hazardous components such as CRTs(2%).

1.2 This picture of hazardous waste production and management differs to the one previously reported in the 2011 Proposed Sites and Policies draft WLWP (which was based on HWI data from 2006 only). This is due to:

- Inclusion of inputs to sites in the WDI such as End of Life Vehicles[17];
- inclusion of hazardous healthcare waste managed at the Hillingdon Hospital Incinerator (which isn't recorded in the HWI).

This has resulted in a significantly altered profile of hazardous waste production and increase in Plan Area management capacity.

[16] Believed to arise from dredging of lengths of inland waterway such as the Grand Union Canal that runs through the Plan Area.

[17] This is due to the presence of liquids, such as oils and coolants within vehicles.

5.5. Management of Hazardous Waste in west London

Waste management sites in West London provide significant capacity for the following:

- depolluting of ELVs brought in from outside the Plan area for treatment (in particular South London (12,800 tonnes) and East of England (2,000 tonnes)).
- significant quantities of oil based liquid wastes were received from the West Midlands (7,700 tonnes into the Sharpes Recycle Oil Reclamation Facility) and the South East (2,150 tonnes into the Brent Oil Contractors Transfer Station).
- infectious clinical waste from outside the Plan area via a transfer station. (5,000 tonnes to the Hillingdon Hospital incinerator).

There are some significant flows of materials coming into Plan area transfer facilities that then get moved on to facilities outside the Plan area. This means that arisings of hazardous waste attributed to the Plan area may be artificially inflated - as the waste gets classed as coming from the Plan Area when it moves from the transfer site to another location. For example 1670 tonnes of track ballast are received at the Balfour Beatty yard but is all recorded as coming from south London. It is then moved on to Peterborough for treatment. Thus south London's contaminated ballast becomes recorded as west London's contaminated ballast.

5.6. Analysis of Flows by Fate

The pattern or profile of management of hazardous waste produced in West London is illustrated in Figure 1 below

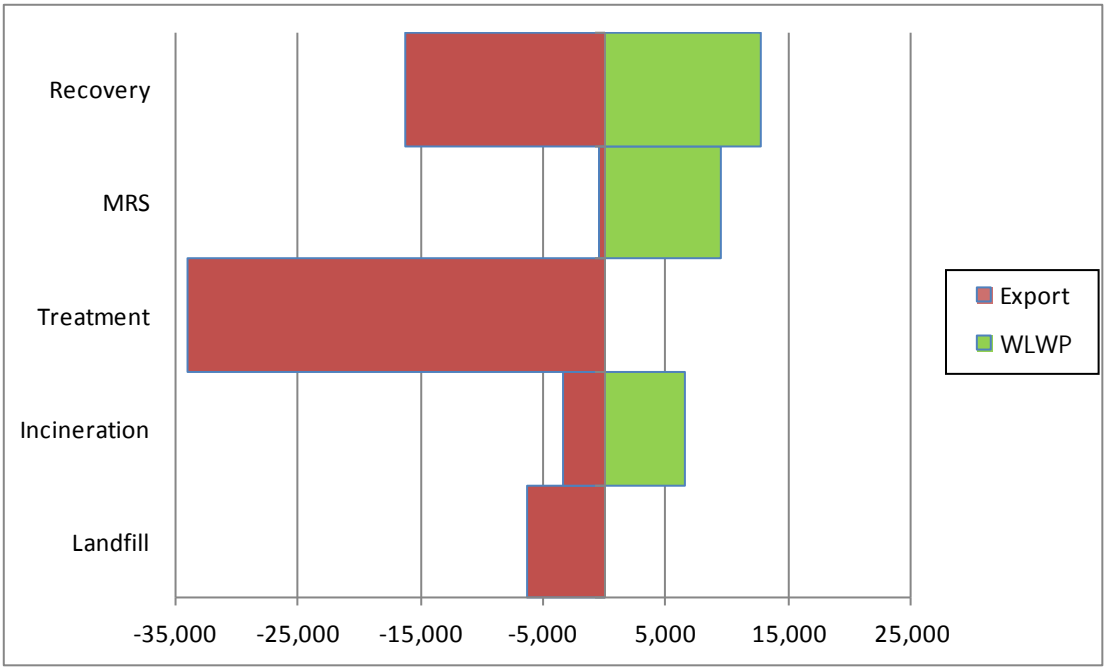

Figure 1: Hazardous Waste Management Route Flows Profile 2012

This figure illustrates that the majority of hazardous waste exported from west London is managed at treatment facilities. As is shown in Table 3 below, this treatment is occurring at a wide range of facilities in different locations offering a particular form of specialist management for a certain type of hazardous waste received from a wide area. It is questionable whether the development of such specialist capacity in west London would attract sufficient quantities of waste from a sufficiently wide area to make it viable. There follows analysis of where waste is moving, following which management routes.

5.7. Mapping Movements

The combined dataset was analysed to establish tonnages going to individual WPA areas. The results are shown in Figure 2 below. This informed the Duty to Cooperate exercise as it identified all WPAs receiving hazardous waste from West London in 2012 regardless of quantity.

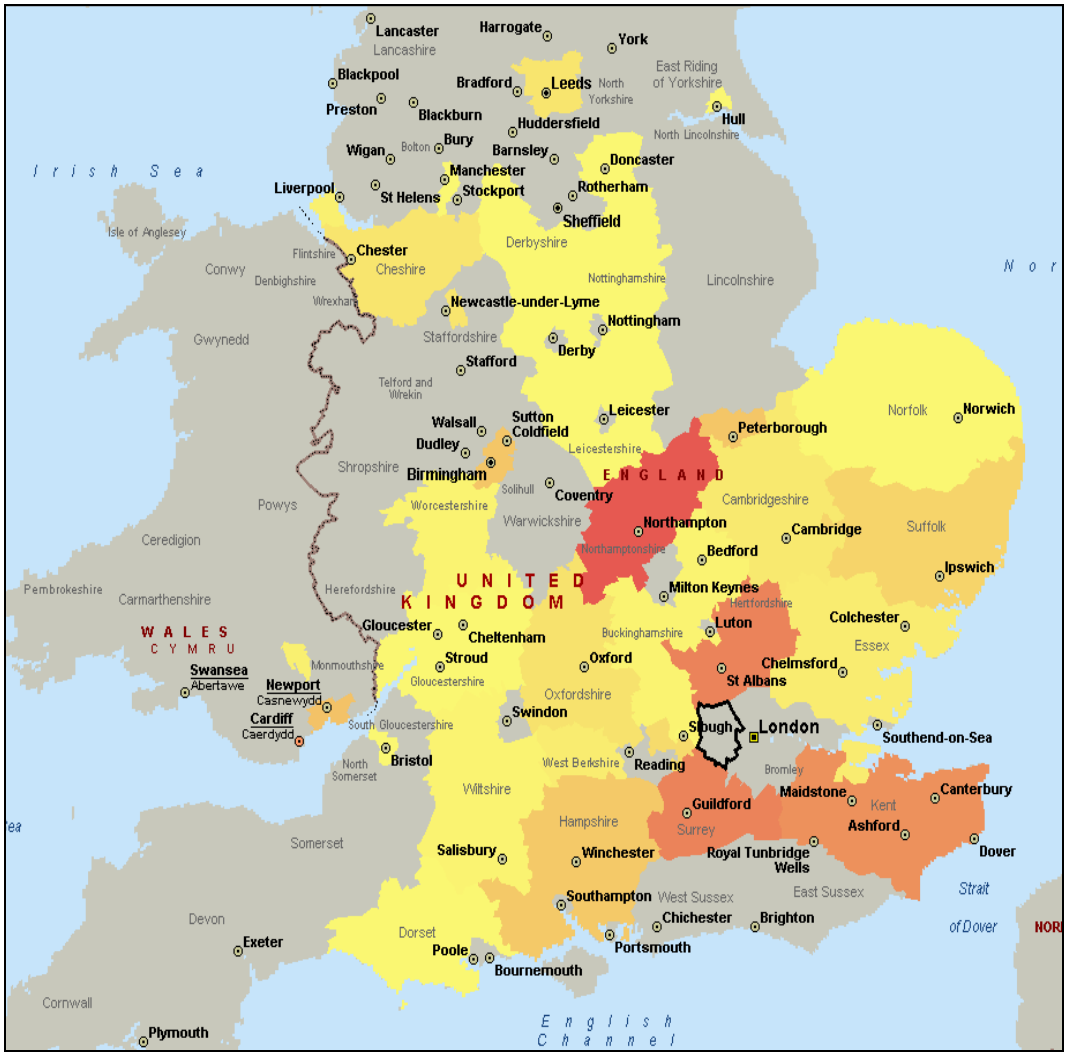

Figure 2: West London Hazardous Waste Exports 2012 Mapped by Tonnes & Receiving WPA

To establish the indicative transport impacts associated with the movements a zoning exercise was undertaken using generated isochrones. This allocated movements of waste to WPAs to different zones depending on how far the receiving WPA is from the Plan Area. The method is described in detail in Appendix 1.

The integrated dataset was then interrogated by European Waste Classification (EWC) Waste description to identify the quantity being transported to each zone. The waste exports were ranked by order of quantity (largest to smallest) and this included 90% of all exports. The values in excess of 100 tonnes were then colour coded by management route/fate. The results are displayed in the matrix (Table 3) below.

Table 3: Management of West London Hazardous Waste Exported in 2012

Ranked by tonnage, zoned by distance moved and colour coded by fate.

	Zones beyond Plan Area								
EWC Category	**<0.5hr**	**0.5hr-1hr**	**1hr-1.5hrs**	**1.5hrs-2hrs**	**2hrs-2.5hrs**	**2.5hrs-3hrs**	**3hrs+**	**Grand Total**	**Cum %**
Oily water from oil/water separators		600	4,739	1,343	582		172	7,437	10%
Dredging spoil			46		6,858			6,904	19%
Soil & stones		219	2,341		4,138		204	6,902	29%
Infectious waste	7	127	4,367	858	733	22	22	6,136	37%
Non-chlorinated mineral oils	1	475	4	220	690	1,486	1,003	3,879	45%
Lead batteries	428	174	809	107	882	173	464	3,036	49%
Discarded electrical & electronic equipment	0	11	44	470	2,479	10	8	3,022	54%
Acids not otherwise specified				13		2,948		2,962	57%
Other engine, gear & lubricating oils			9	488	450	1,304	631	2,882	61%
Aqueous liquid wastes		10	2	182	2,502	82	15	2,793	65%
Construction materials containing asbestos	3	7	812	153	1,401	19	129	2,523	69%
Hydrochloric acid				2,326	92	3		2,421	40%
Track ballast					2,054			2,054	71%
Other construction & demolition wastes		56	8	3	1,402			1,470	73%
Discarded equipment containing cfcs		759	112	6	53	1	151	1,081	76%
Bleach solutions & bleach fixer solutions			1		3		1,061	1,065	77%
Wastes not otherwise specified				1	979			980	79%
Degreasing wastes		1	1	9	220		667	898	80%
Interceptor sludges		5	84	534	126		15	764	74%
Absorbents, filter materials etc		51	38	432	102	32	63	717	81%
Other wastes				186	491	15	-	692	82%
End-of-life vehicles		69	493	55	64		3	684	83%
Waste paint & varnish organic solvents		1	11	43	61	4	521	640	84%
Insulation materials containing asbestos	1	3	321	40	235		6	606	82%
separators				167	369	17	24	576	85%
Discarded equipment		48	6	70	116	242	44	526	86%
Oil & concentrates from separation				32	22		456	510	86%
photographic wastes					380		-	380	87%
Packaging		35	19	233	29	24	36	376	87%
Other fuels		5		89	185	14	83	376	88%
Oil filters		48	5	50	165	14	88	370	88%
Discarded equipment containing cfcs, HCFC, HFC		82	71	19	93	3	67	335	89%
Solid wastes from gas treatment				1	330		-	331	89%
transmission oils		9			144	20	65	238	90%
Sludges from oil/water separators		41	23	120			15	199	90%
Total per zone	**439**	**2,836**	**14,366**	**8,250**	**28,429**	**6,433**	**6,013**	**66,765**	
	0.6%	**3.8%**	**19.3%**	**11.1%**	**38.3%**	**8.7%**	**8.1%**		
Cumulative % with distance	**1%**	**4%**	**24%**	**35%**	**73%**	**82%**	**90%**		

Transfer
Treatment
Recovery
Physico-chemical Treatment
Treatment/Recovery
Landfill
Recovery/Landfill/Treatment
MRS/Recovery/Landfill
Incineration
Unknown

The analysis shows that:

- Nearly 80% of hazardous waste arising within the Plan Area is managed within 2.5 hours driving time of the centre of the Plan Area.
- Waste going to landfill may travel short or long distances regardless of its type.

5.8. Forecasting Future Arisings

Due to frequent changes in the definition of hazardous waste, and refinement of guidance, reliance on historical data to establish possible future trends in hazardous waste production is not considered reliable. Reference has been made to The National Policy Statement for Hazardous Waste[18] for some guidance and considerable reliance has been placed on expert judgement in the process of generating forecast estimates for west London.

The National Policy Statement for Hazardous Waste states that arisings of hazardous waste are expected to increase for the following reasons:

- Continuing consumer demand for new consumer goods such as electronics and electrical equipment means that Waste Electrical and Electronic Equipment (WEEE) will continue to arise as older models are discarded;
- increasing use of producer responsibility schemes, such as those provided for by the EU Waste Electrical and Electronic Equipment (WEEE) Directive 2002. Such schemes require the separate collection of WEEE and this results in more household hazardous wastes being removed from the mixed municipal waste stream, collected separately as hazardous waste and sent for treatment;
- changes to the list of hazardous properties in the revised Waste Framework Directive and forthcoming changes to the European Waste List, are expected to

[18] National Policy Statement for Hazardous Waste: A framework document for planning decisions on nationally significant hazardous waste infrastructure Defra June 2013

lead to further increases in the amount of waste that must be managed as "hazardous";

- there are still products for which there remains no alternative but to use a hazardous component, in addition services such as transport, are likely to produce hazardous waste such as oil for the foreseeable future.

Building on this background information, forecasts have been developed for west London - these are displayed in Table 7 below.

We have gone through a process of identifying possible inhibitors and promoters of growth in production of the specific waste types over the next 20 years. Judgement has been used to assess if those factors together will result in a decline, increase or no growth. Judgment has then be used to assign annual % growth rates to the predicted direction of growth to arrive at estimates for arisings in West London in 2031. In general a pessimistic approach has been taken to avoid under-estimation.

Growth estimates have been made for the wastes that account for those streams that occurred in quantities of 500 tonnes per annum or more in 2012, this is because increasing quantities of these waste are more likely to present issues with the adequacy of existing management capacity. These estimates (see Table 6 below) suggest growth of up to 15,000 tonnes per annum over the period for these streams alone. To account for the remainder it has been assumed that they will remain constant. This gives a total forecast arising in 2031 of 113,170 tonnes - a rise of 28% on the 2012 baseline. This equates to an annual growth rate of 1.3%.

Table 4: Estimated Forecast Arising of Hazardous Waste in West London at 2031

NB: projected growth rates based of judgement

	Tonnes Produced 2012	Principal Source	Key Factors		Predicted Direction of Production	Factor (% pa)	Predicted quantity at 2031
			Promoter	**Inhibiter**			
Oil Residue	9,287	Surface Water Protection/ Pollution control system	Tighter regulatory control on risky sites; Increased rainfall due to climate change (more frequent emptying)	Improved spillage control; Reduced number of petrol stations	Moderate Increase	2.00%	13,530
Oil based	6,761	Transport	Greater reliance on central distribution & internet shopping; Increase in car ownership and use.	Rising fuel cost (offset by fuel duty escalator); Rising cost of management of waste with pressure to regenerate over use as fuel. Improved vehicle efficiency.	Significant rise	5.00%	17,084
Acid based	5,383	Manufacturing sector	May be at limits of efficiency	Cost/resource efficiency pressure	Stable	0.00%	5,383
Asbestos based	3,129	Pre 2000 Building stock - refurbishment & demolition	Increase in demolition with increase pressure for residential provision on previously developed sites.	Reduction of amount embedded in stock	Stable for 10yrs then steady decline	-2.00%	2,132
ELV based	3,720	Existing vehicle stock	Increase vehicle sales displace existing stock	ELV directive pressure to improve recyclability may encourage switch to use of less hazardous materials; Longevity of vehicles improve	Moderate Increase	2.00%	5,419
Infectious	6,136	Clinical Sources	Infection control pressure	Improved source segregation driven by cost reduction pressure	Stable	0.00%	6,136
Specific	15,550	One-offs		Reduction driven by cost	Stable	0.00%	15,550
Unknown/ Various	13,553	Unknown		Reduction driven by cost	Stable	0.00%	13,553
							80,316
Expansion of Haz Waste Definition						10.00%	8,032
subtotal	***63,519***						***88,348***
Remainder (sub 500)	24,822						24,822
Total	88,341						**113,170**

5.9. Possible Capacity Requirements

The Government *Strategy for Hazardous Waste Management in England (2010)'* established the need for new hazardous waste facilities and set out the types of facility required. Of the facilities identified, the Strategy determined that the following generic types would be likely to include the following facilities:

- Facilities to treat oily wastes and oily sludges
- Waste electrical and electronic equipment plants
- Oil regeneration plant
- Bioremediation / soil washing to treat contaminated soil diverted from landfill
- Hazardous waste landfill
- Treatment plant for air pollution control residues

Each of these has been considered in the West London context below:

Facilities to treat oily wastes and oily sludges

This forms the largest stream of hazardous waste arising in the Plan Area and the Strategy for Hazardous Waste Management in England identified a need for additional facilities to allow a higher proportion of this waste to be recovered. It is thought that the development of new facilities could increase the proportion of this waste that can be recovered.

Oil regeneration plant

The National Strategy identifies a need for further capacity for recycling used lubricants to a very high level back into base lubricating oil. At present, most waste oil is processed into a fuel substitute and used for energy recovery. However, to realise the benefits of moving the management of this waste up the waste hierarchy, capacity for the regeneration of waste oil needs to be increased. Any oil regeneration plant is likely to have a capacity of at least 70,000 tonnes per annum to be viable and new facilities are therefore expected to be nationally significant infrastructure.

A number of facilities within the Plan Area manage waste oils receiving significant quantities in 2012 (7,700 tonnes into the Sharpes Recycle Oil Reclamation Facility & 2,150 tonnes into the Brent Oil Contractors Transfer Station). If the Government strategy objectives are to be met then it may be that capacity will need to be expanded or adapted.

Waste electrical and electronic equipment plants

While there is sufficient capacity to deal with refrigerators and CRT based WEEE, there is a growing need for specialist facilities to treat the Flat Panel Displays used in some computer monitors, TVs and laptops. These contain mercury. Existing facilities for the more general treatment of waste electrical and electronic equipment have not been designed to deal with this waste stream because Flat Panel Displays are relatively new and have only recently started to be discarded as waste.

Figures from the Waste and Resources Action Programme (WRAP) of arisings of waste desktop monitors, laptops and LCD TVs containing fluorescent backlights[19] show that arisings are expected to increase from 70,000 tonnes in 2013 peaking at around 120,000 tonnes in 2016 and then falling from that point on. Technologies for managing Flat Panel Displays are currently under development and are expected to require a large investment, which is likely to drive the development of a small number of larger facilities to manage the expected arisings.

Bioremediation / soil washing to treat contaminated soil diverted from landfill

While the National Strategy identifies a need for greater capacity to treat contaminated soil, within West London the quantity of such waste that went to landfill in 2012 was very small. It is hard to predict what quantities may arise should construction activity revive to pre 2008 levels. While some soil will be treated by mobile plant at the site of production, some will need to be treated off-site and there remains a need for dedicated

[19] http://www.wrap.org.uk/content/flat-panel-display-recycling-technologies

permanent facilities which are often based on landfills. The East Northants Resource Management Facility at Kings Cliffe, Northamptonshire is a case in point operating treatment and landfill and is within 1.5 hours of the Plan Area centre. It is understood that a significant quantity of soil and stones generated in the Plan area were managed there in 2012. This has recently been granted an extension under The East Northamptonshire Resource Management Facility Order.

Hazardous waste landfill

The Strategy for Hazardous Waste Management in England includes a principle to reduce reliance on landfill, which is to only be used where, overall, there is no better recovery or disposal option. However, in the case of west London there is no capacity for management of hazardous waste either at dedicated hazardous waste landfills or non hazardous waste landfills with dedicated cells. The nearest hazardous waste landfill to west London is at Tripcock Point in Greenwich. Current flows of hazardous waste to landfill amounted to 6,250 tonnes in 2012.

Treatment plant for air pollution control residues

There is a need for further facilities to treat the Air Pollution Control (APC) residues that arise from the treatment of flue gases from incinerators and energy from waste plant (EfW). Currently APC from the Hillingdon incinerator is sent to the East Midlands for management in relatively small quantities (493 tonnes in 2012). Arisings would increase significantly in future years if more EfW facilities were to be developed in the Plan area.

6. Conclusion & Recommendation

The analysis indicates that:

1. There is sufficient capacity within a reasonable travel time of the Plan Area to manage most of the principal hazardous waste streams arising in the Plan Area. Thus the arrangements appear to be reasonably resilient.
2. The vast majority of hazardous waste arising in west London is managed through recovery, with disposal either through landfill or incineration only being used as a last resort. Therefore the need to make specific provision in the Plan for capacity that promotes movement of this waste stream up the waste hierarchy appears largely to be satisfied at facilities within and beyond the Plan Area.

Bearing in mind provision for management of hazardous waste is not necessarily expected to be made at Plan Area level, there does not appear to be a specific need to make provision for additional management capacity within the Plan Area itself.

The forecasts indicate that hazardous waste arising in West London may grow from the current level of around 88,340 tonnes to as much as **113,170 tonnes in 2031**. However there is unlikely to be sufficient quantities of individual hazardous waste streams arising to warrant provision of specialist facilities to manage it within west London.

This assessment supports adoption of the following policy positions:

1. Existing hazardous waste management capacity to be safeguarded where it is consistent with other policies of the Plan.
2. No provision of additional specific hazardous waste management capacity.
3. Proposals for the management of hazardous waste that come forward should demonstrate that the proposed capacity is primarily intended for the management of waste arising in west London.
4. Annual monitoring to establish the implementation of the policy position on hazardous waste..

Appendix 1: Analysis of West London Export of Hazardous Waste

1. Integrating Datasets

- Two data sets were extracted from the WDI – tonnes of hazardous waste from the plan area received by sites anywhere (inputs) and tonnes of hazardous waste removed from sites within the plan area (outputs). Outputs that went to sites within the Plan Area were deleted to avoid double counting.
- A dataset from the HWI for waste that originated in the plan area was also extracted.
- Additionally a dataset of inputs and outputs of waste to facilities that are not recorded by the WDI (non-WDI) waste was sourced from the EA.
- Waste moving within the plan area was ignored.
- The inputs and outputs files were combined using the following rules:
    - If the input value was less than the output value, the sum of the values was taken.
    - If the input value was greater or equal, then only the input value was taken.
    - If the resulting value was less than the HWI value, the two were added together, otherwise the WDI was ignored. The resulting value was then added to the Non-WDI value.

<u>To eliminate/reduce double counting</u>

- The dataset was supplemented with a field indicating WPA. If there were multiple records found with similar tonnage and a similar destination WPA, only one record was kept (that with the most specific destination).

2. Zoning Flows

The following approach was taken:

- A central point in the Plan Area was identified, from which seven 'drive time' zones (isochrones) were created. (Figure A1.1)
- The zones were created at 30 min intervals, up to 4 hours (240mins) driving time from the centre of the Plan Area. However as the 30 minute isochrone closely corresponded to the boundary of West London and there was no WPA that fell completely within the small overlap (coloured turquoise on figure A1.1) it was discounted. This mean that the isochrones beyond West London should be adjusted by 30 minutes to reflect the fact.
- Each WPA area was allocated a driving time zone from the Plan Area.
  Because the location of each receiving site within a WPA area was unknown, each WPA was allocated to the drive time zone that enclosed the *furthest* limit of that WPA area. i.e. if Gloucestershire falls partly into the 1hour isochrone with the remainder falling within the 1.5hr isochrone the whole of Gloucestershire was all zoned to the 1.5 hour isochrone.

Zone	Time	Tonnes	%	cum %
0		441	1%	1%
1	**30 mins**	2,917	4%	5%
2	**1hr**	14,950	20%	25%
3	**1.5hr**	12,092	16%	41%
4	**2hrs**	29,779	40%	81%
5	**2.5hrs**	7,026	9%	90%
6	**3hrs**	5,951	8%	99%
7	**3.5hrs**	602	1%	99%
8	**4hrs**	461	1%	100%

Table 5: Drive Time Zones and Tonnes Managed 2012

Table shows the distribution of movement of Plan Area hazardous waste that leaves the Plan Area for management. To simplify presentation zones 6 to 8 were amalgamated as shown in Figure 1.

The outputs are shown in Figure A1.1 below

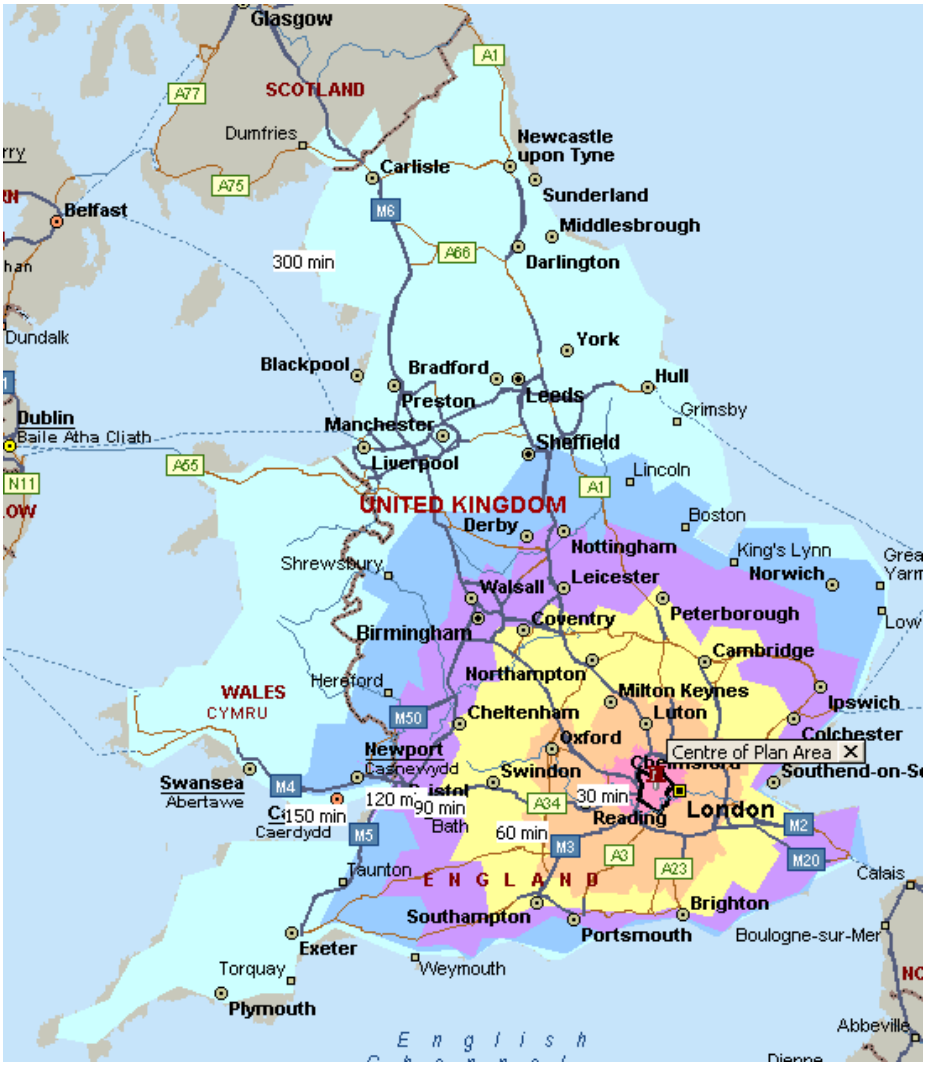

Figure A1.1: Isochrone Zones used to zone West London Hazardous Waste Exports 2012