WEST MIDLANDS REGIONAL ASSEMBLY- REGIONAL PLANNING BODY

This report has been prepared on behalf of the West Midlands Regional Assembly, the Regional Planning Body, as technical advice to inform the Regional Spatial Strategy Revision process. It is one of a suite of technical reports commissioned to inform the development of spatial policy as part of Phase Two Revision on West Midlands Regional Spatial Strategy.

Golder Associates (UK) Limited

1st Floor Clyde House
Reform Road
Maidenhead
Berkshire, SL6 8BY
England

Tel: [44] (0)1628 586200
Fax: [44] (0)1628 770699
E-mail: golder_uk@golder.com
http://www.golder.com

FINAL
REPORT ON

WEST MIDLANDS WASTE TREATMENT CAPACITY SURVEY

Submitted to:

West Midlands Local Government Association
4th Floor, Lombard House
145 Great Charles Street
Queensway
Birmingham
B3 3LS

DISTRIBUTION:

30 copies - WMLGA
1 copy - MEL Research
2 copies - Golder Associates (UK) Ltd.

August 2004 03513396

REPORT ISSUE FORM

Version Code	A3	***Issue Date***	27 August 2004
Document Title	**West Midlands Waste Treatment Capacity Survey** 03513396		
Comments			
List of Authors	Barbara Leach (MEL) Alan Potter		
Client	West Midlands Local Government Association		
Client Reference			
Project Manager Approval	Ed Perry (name)		(signature)
Reviewer	Ed Perry (name)		(signature)

Report Distribution

Name	*No. Copies*
WMLGA	30
MEL	1
Golder Associates (UK) Ltd	2

Definition of Version Code:
D. Applied during initial drafting of the report before it has been reviewed.
C. Applied after the report has been reviewed but before it has been approved by the Project Manager.
B. Applied after the Project Manager has approved the report ready for issue to the client.
A. Applied to reports after external/client review.
The version number starts at '0' and is raised by '1' at each re-type.

NON-TECHNICAL SUMMARY

The West Midlands' Regional Technical Advisory Body for Waste's (WMRTAB) objective is to identify the need for any new treatment facilities required by the region. The WMRTAB therefore needs to know what facilities currently exist and their potential capacity to accept waste for the future management of waste arising within the West Midlands Region.

The treatment of waste will gain in importance within the region. Facilities will be needed not only to deal with current waste arisings (which are increasing) but will need to provide sufficient capacity so that the Region can effectively respond to the range of legislative pressures on existing management routes e.g. disposal to landfill

While a variety of information is available from the Environment Agency and Waste Planning Authorities this is of variable quality. Also while the information held may define the maximum theoretically permitted throughput for a site (which may often purely be defined by the licensing charging bands and thus bear little relation to the actual capacity) it does not define the practical operational maximum throughput capacity nor the throughput capacity for specific waste streams. This information has to be obtained from a site-by-site trawl of information and thus a survey was carried out of operators of waste treatment facilities within the West Midlands.

Pilot Survey

A pilot survey was initially carried out during July 2003 involving a small selection of the treatment facilities to test the survey forms to see that they elicited the required information; and to check the accuracy of the database of licence holders.

The sites were categorised according to the treatment they undertake: thermal, biological, physical, chemical/physico-chemical or metal recycling enabling a generic spreadsheet to be developed for each category.

The main difficulty that was highlighted as with all surveys is that the provision of information is purely voluntary and if the company perceives this not to be of value or is detrimental to the management of its time, it is extremely difficult to obtain the required information. The pilot survey also highlighted the variable quality of the Environment Agency data that was to be used as the source data for the main survey

Full Survey

The full survey was carried out between September and December 2003, the methodology for which was the same as that for the Pilot Survey except that it included all remaining sites.

The response rate achieved for non-metal recycling sites was significantly higher than for metal recycling sites. This is largely attributable to the difference in perception of operators of

non-metal recycling sites as being part of the waste management industry while metal recycling site operators often do not consider they are dealing with waste material and the metal recycling industry operates as a largely separate entity from the waste management sector.

Thermal treatment

Responses were received from four of the five municipal waste incinerators in the region, a metal smelter and an animal carcass facility with four non-respondents including a major municipal incinerator.

A declared total of 910,966 tonnes was received in 2002/3 by thermal treatment facilities responding to the survey. When combined with estimated inputs for the non-respondents derived from Environment Agency data (142,600), an estimated 1,053,566 tonnes of waste was dealt with by thermal treatment within the West Midlands region in 2002/3.

The bulk of MSW incineration capacity provided within the West Midlands Conurbation serves the conurbation itself with little waste imported into the region (1.4% of the total waste received by the respondents is imported from outside the region).

For MSW the surplus capacity is the difference between the authorised capacity for the facility data minus actual input derived from survey. There is a significant difference between the actual input and the authorised capacity for two of the Region's MSW incinerators. This may suggest: that these facilities are under-utilised; that they have significant amounts of down time; or for various reasons, the capacity was over estimated at the time of authorisation.

The potential for the movement of MSW for incineration may increase with the introduction of the Landfill Allowance Trading Scheme which could mean that the 70,000 tonnes per annum (tpa) spare capacity becomes contracted for use by other WDAs if this has not already been done.

For specialist incineration there appears to be significant surplus capacity and additional capacity at the cement kiln to accept more tyres as fuel. It is not clear what the constraints are on utilisation at present.

Overall, the picture that has emerged suggests that the West Midlands Region's MSW incinerators are operating at or just above capacity depending on how this is defined. There is spare capacity for some of the more specialist waste streams, namely animal carcasses, clinical waste, tyres and chemical waste. Spare capacity has been calculated using information supplied in the questionnaires for the respondents and for non-respondents by using other data sources supplied by the Agency. Either comparing waste inputs returns data with licensed capacity as determined by the Agency for charging purposes or declared capacity in IPC authorisations. Where spare capacity has been calculated on charging bands there may be reasons why this licensed capacity cannot be used. It may even be an artefact of the Agency

charging bands and may not exist in reality. Therefore it is not recommended to rely on this for future provision.

The prime source of declared outputs (251,171 tpa from respondent sites) was from the MSW incinerators. One issue that will require further exploration when looking at future treatment capacity is the issue of the fate of fly ash – otherwise known as air pollution control (APC) residues. With the implementation of the Landfill Directive the disposal of these residues will become problematic. The APC waste is identified as hazardous under the EU Hazardous Waste List and hence the APC can only be disposed of to a hazardous waste landfill site.

With the cessation of co-disposal of hazardous and non-hazardous waste on July 2004, the number of landfills accepting hazardous waste has been significantly reduced. A further complication is that even at hazardous waste landfills there will be stringent waste acceptance criteria that are likely to be in operation from 2005. It is unlikely that APC residues can be disposed of in an untreated state and indeed the Directive requires all hazardous waste destined for landfill to be pre-treated from July 2004. Hence it is anticipated that a further demand for treatment capacity which may involve stabilization/solidification and encapsulation of the APC waste in a concrete or glass matrix will be created. Alternative treatments such as using the alkaline content of the residue to neutralise acid wastes are also being investigated.

Biological Treatment

Responses were received from all five operational biological treatment facilities in the West Midlands Region. These included three composting sites and two sewage treatment works receiving controlled wastes. Exempt sites were excluded from the survey.

A declared total of 310,521 tonnes was received in 2002/3 by licensed biological treatment facilities in the West Midlands Region. This excludes both sewage treated at sewage treatment works and sewage sludge arising from sewage treatment works requiring further treatment.

The majority of food processing and aqueous waste (72%) dealt with in the West Midlands Region is actually imported into the West Midlands conurbation. This might be anticipated as these are high value waste streams, which together with the provision of regionally significant facilities in the form of sewage treatment works and specialist facilities will have a significant influence on the movement of the waste.

This would not appear to accord with the proximity principle nor the aspiration of achieving regional self-sufficiency, however this does not take account of the many on-farm composting facilities that are exempt from obtaining a waste management license. These exempt site are likely to provide wider coverage and comply with the proximity principle but only treat green waste as they use open windrows. In addition the tight boundaries round the built-up areas of the metropolitan authorities may have a significant effect on the location of the facilities surveyed.

It is therefore recommended that the provision of such facilities in adjacent regions and exempt facilities is assessed to establish the necessity for such significant movements. There is also some movement of green waste to composting facilities even though it might be expected that local authorities would make provision for composting in their own area as the value of this waste stream is not high.

Overall, the picture that has emerged suggests that the West Midlands Region's biological treatment facilities have a significant amount of spare capacity. Composting facilities have 22% spare capacity. There is a spare capacity of 68% for the treatment of food waste and 64% for the treatment of aqueous waste. This does not take account of exempt sites.

This is consistent with feedback from the principal operator of treatment capacity for these wastes types who stated that the plant is likely to undergo a rationalisation of treatment processes and technology to reflect changes in the market place. There is to be a greater focus on selective processing of problematic waste materials. Consideration is being given to refurbishment of the plant with respect to process efficiency, with an expected overall reduction in residue output.

A total of 6,020,568 tonnes of materials were output from licensed biological treatment sites in 2003/4 with 92% of this being liquid effluent disposed of to sewer.

Physical Treatment

Responses were received from eight of the 21 physical treatment facilities that are known to be operational. These include processors of oils, inert waste and wood packaging.

A declared total of 253,518 tonnes was received in 2002/3 by physical treatment facilities responding to the survey. When combined with estimated inputs for the non-respondents derived from Environment Agency data, an estimated 495,828 tonnes of waste was dealt with by physical treatment within the West Midlands Region in 2002/3.

The overall focus of physical treatment would appear to be to refine incoming waste streams for recovery and onward recycling. There is likely to be a direct link between the provision of facilities and the existence of legislative drivers e.g. facilities for the treatment of soil, rubble and C&D waste – avoid landfill tax and promotion of secondary aggregates through aggregates levy

Whilst the West Midlands conurbation serves most of the region, Shropshire provides the only other capacity of respondents for soil/rubble. This represents nearly 12% of the regional capacity for the soil/rubble waste stream. In view of the weight of the waste stream and its relatively low value it is perhaps surprising that over half of the inputs to that County come from outside the County and over a quarter comes from outside the region.

There would appear to be spare physical treatment capacity in the West Midlands Region across all types of activity with all but two of the eight sites' capacity being under utilised in 2002/3. The market appears to be sufficiently developed for operators to invest in treatment capacity but either competition for waste is strong or further needs have been anticipated.

The capacity for the treatment of C&D waste is likely to be under-reported due to a large number of mobile plants which being Part B processes do not have to provide returns detailing the quantity of waste treated.

Aggregating the outputs and relating them to the facility inputs gives a clear picture of efficiency of the different physical processing methods used. In the case of heavy materials 35% of the input is being diverted from landfill for higher grade recycling (not including 'recovery' through use in the licensing exemptions). A 100% recycling rate is achieved for packaging recycling and a 95% recovery/recycling rate is achieved through oil treatment. However, in the latter case a significant proportion of additional effluent is created requiring disposal and a number of waste streams need to go on for further treatment which will add to the costs of the overall process.

Chemical/Physico-chemical Treatment

Responses were received from seven of the fourteen chemical and physico-chemical facilities operating in the West Midlands Region.

A declared total of 155,693 tonnes was received in 2002/3 by chemical/physico-chemical treatment facilities responding to the survey. When combined with estimated inputs for the non-respondents derived from Environment Agency data, an estimated 177,060 tonnes of waste was dealt with by chemical/physico-chemical treatment within the West Midlands Region in 2002/3.

The Region appears to be largely self sufficient in capacity with 18% of inputs received from outside the Region.

Overall, the picture that has emerged suggests that the West Midlands Region's chemical and physico-chemical facilities are operating below capacity, however it is difficult to be certain due to the low response.

Capacity provision for the region is made almost solely by the West Midlands conurbation. Overall, the picture that has emerged suggests that the West Midlands Region's chemical and physico-chemical facilities are operating below capacity, however it is difficult to be certain as many facilities dealing with reactive chemicals need to maintain a 'reserve' capacity for operational purposes. This is primarily to store materials prior to use as reactants. In addition capacity is not interchangeable between waste streams and hence additional capacity to deal with specific waste streams may be required.

The prime intention of physico-chemical treatment is to reduce the hazardous nature of wastes and improve their manageability. Their prime focus is on pre-treatment of waste prior to disposal, whether by landfill (solids) or to sewer (liquid effluents).

Metal Recycling Facility

There is an extensive supply chain for metal recycling that extends beyond the West Midlands planning region. There are two fragmentiser plants operating in the West Midlands and they are the top of the supply chain. The EMR plant in Birmingham deals with around 330,000 tpa input producing 250,000 tpa output for recovery with remainder landfilled. Dunns Brothers operate a 50,000 tpa input machine in Birmingham producing approximately 35 kilo tones per annum (ktpa) output for recovery and remainder landfilled. Thus total top tier treatment capacity for ELVs and white goods in the region is around 380,000 tpa input. Of this 58% (193,000 tpa) is estimated to be utilised for ELV and the rest is white goods other than fridges, which are dealt with separately through two fridge reprocessing plants which de-gas and shred.

Heavy ferrous metal is dealt with by multiple operators with shears and will tend to go direct to smelters.

Overall, the picture is unclear due to the low rate of return of the questionnaires. From the responses obtained it appears that the region has spare capacity both for processing of end of life vehicles and for metal recycling.

In addition there was a lack of indication from operators as to whether any modification of their premises will be undertaken in response to the ELV Directive. However, if the provision of capacity for the de-pollution of ELVs is dependant on metal recycling sites it is possible that there may be a shortfall in capacity.

Summary and Conclusions

The findings of this study suggest that there is excess capacity in the system to deal with additional waste requiring treatment. However this is a misleading view since the spare capacity identified is marginal, and within such a margin of error as to not be reliable. What is beyond doubt is that new legislative requirements will increase demand such that it can easily be expected to exceed it in the near future. Also treatment capacity is not interchangeable between waste streams. Certain wastes will only be amenable to treatment by certain means.

To build a firm foundation an annual monitoring survey is needed to build on this work and the effective use of site return data. This must then be tied in with forecasts of arisings for specific waste streams and consideration of their likely management routes.

TABLE OF CONTENTS

APPENDICES

LIST OF TABLES

LIST OF FIGURES

1.0 BACKGROUND TO THE PROJECT

1.0.1 The West Midlands' Regional Technical Advisory Body for Waste (WMRTAB) objective is to produce a robust waste strategy that can be used as a basis for planning for the future management of waste arising within the West Midlands Region.

1.0.2 The treatment of waste will gain in importance within the Region. Facilities will be needed not only to deal with current waste arisings (which are increasing) but will need to provide sufficient capacity so that the Region can effectively respond to the range of legislative pressures on existing management routes e.g. disposal to landfill. This includes:

- The ban on landfilling of certain wastes introduced by the Landfill Directive (in force and to come into full effect by 2009) and closure of certain sites classed as landfills (e.g. lagoons);
- The cessation of co-disposal of hazardous and non-hazardous waste to landfill (to come into effect in mid 2004);
- The requirement to pre-treat hazardous waste (2004) and to pre-treat non inert waste destined for landfill (by 2009);
- The requirement for hazardous and inert waste destined for landfill to meet specified waste acceptance criteria (2005);
- The expansion of the hazardous waste stream due to the introduction of the European Waste Catalogue and Hazardous Waste List;
- The implementation of Directives on End of Life Vehicles (2005) and Waste Electrical and Electronic Equipment (2007);
- The introduction of increased recycling and recovery targets for packaging waste (2008);
- The progressive introduction of the PPC regime for existing LAAPC, IPC installations and other major facilities (by 2007) with its imperative to encourage minimisation and recycling and recovery of waste.
- The advent of the BMW diversion targets from landfill (2010,2016, 2020)

1.0.3 The regional plan or spatial strategy must therefore identify the need for any new treatment facilities required by the Region over the plan period. The WMRTAB therefore needs to know what facilities currently exist and their potential capacity to accept waste. A future study is planned to determine future capacity requirements.

1.1 Project Objectives

1.1.1 The study had a number of objectives. These were given as to determine:

1. The existing throughput of wastes at sites within the region by waste stream;
2. Spare capacity on the existing sites for similar waste streams;

3. Opportunities to add/modify processes to vary waste throughput within existing constraints;

4. Constraints that would limit expansion of throughput, both due to the absolute capacity of the site and associated infrastructure and from changes in the proportions or concentrations of input wastes;

5. Residues produced, their disposal point, and the potential for reuse of these residues or indication of further treatment needs prior to landfill;

6. Develop a robust information gathering methodology to support the ongoing monitoring process including trialling and development of a pre-prepared questionnaire.

1.1.2 While a variety of information is available from the Environment Agency and Waste Planning Authorities this is of variable quality. Also while the information held may define the maximum theoretically permitted throughput for a site (which may often purely be defined by the licensing charging bands and thus bear little relation to the actual capacity) it does not define the practical operational maximum throughput capacity nor the throughput capacity for specific waste streams. This information has to be obtained from a site-by-site trawl of information and thus a survey was carried out of operators of waste treatment facilities within the West Midlands. Hence the achievement of the objectives was largely dependant on the provision of data from third parties.

1.1.3 In addition the study highlighted the existence of two sets of constraints on utilisation of existing capacity - those imposed by the current market conditions and those imposed by regulatory controls. The latter were deemed by the steering group to present a barrier of a different order of magnitude to utilisation. Hence there was a distinction made between 'actual spare capacity' that might be deployed at the operator's discretion and 'theoretical spare capacity' that would require prior regulatory consent to be deployed and which is not guaranteed to be gained. Capacity rendered unavailable for the latter reasons was discounted from the study results. Hence the design capacity of the plant as limited by any operating restrictions imposed by the licence or planning (such as working hours or number of lorry movements) is reported.

1.2 Pilot Survey

1.2.1 Initially a pilot survey was carried out during July 2003. This involved a small selection of the treatment facilities identified and the purpose of this was:

- to test the survey forms to see that they elicited the required information;
- to test the proposed approach to respondents to the survey (test the water); and
- to check the accuracy of the database of licence holders prior to the main survey.

1.2.2 The sites were categorised according to the treatment they undertake: thermal, biological, physical, chemical/physico-chemical or metal recycling (these categories are defined in Appendix 2). This enabled a generic spreadsheet to be developed for each category which also assisted with the aggregation and comparison of the results. A facility was initially classed as undertaking treatment if it either: possessed a waste management licence that specifically permitted the treatment of waste or recycling of metal; or, it had an IPC permit specifically for waste processing; or, a LAAPC permit for waste related processing activities. Activities involving treatment falling outside the formal permitting system were not included. This includes activities carried out under exemption from waste management licensing or treatment activities undertaken on production sites including effluent treatment plants and filter presses.

1.2.3 The results showed that the pilot survey questionnaire was successful in testing the effectiveness of the survey procedure in gathering the required information from the limited number of respondents.

1.2.4 A number of recommendations were highlighted in the report on the pilot survey to improve response quality, rate and survey efficiency.

2.0 SURVEY METHODOLOGY

2.0.1 The full survey was carried out between September and December 2003. The methodology was the same as that for the Pilot Survey except that it included all remaining sites.

2.0.2 The facilities were split into two groups.

- Those to be surveyed by personal visit (Golder Associates) which were the larger more strategic facilities where a single facility could make a substantial contribution (circa 75,000 tpa) to the management of a particular waste stream within the region.
- Those to be surveyed by post (M·E·L Research) which were smaller facilities where substantial contribution will be due to the aggregation of effects.

2.0.3 Figures 1, 3, 5 and 7 show the locations of all the thermal, biological, physical and chemical/physico-chemical treatment sites, in the West Midlands Region that were included in the survey. The quantity of metal recycling sites is too large to be displayed graphically.

2.0.4 Table 1 details the number of facilities that were included in the pilot survey and the full survey and the number of responses obtained.

2.0.5 Table 1 shows that there was a large range in the number of responses obtained for the different types of treatment facility, which will have a direct influence on the confidence with which the data should be treated. The report has tried to highlight where the data and subsequent conclusions should be treated with caution, however the level of responses should be taken into account when reading this report.

2.1 Site Location

2.1.1 The site locations of the facilities included within the survey are illustrated within Figures 1, 3, 5 and 7 with one figure for each of the treatment types with each figure located in their appropriate chapter.

2.2 Survey Responses

Table 1:Facility breakdown for survey

Type of facility	Total in West Midlands region			Survey response			% response		
	Strategic	Small	Total	Strategic	Small	Total	Strategic	Small	Total
Physical treatment	4	17	21	2	6	8	50	35	38
Chemical treatment	5	11	16	3	4	7	60	36	44
Biological treatment	3	2	5	3	2	5	100	100	100
Thermal treatment	5	5	10	5	2	7	100	40	70
TOTAL NON MRS	17	35	52	13	14	27	76	40	52
Vehicle dismantlers	1	56	57	0	4	4	0	7	7
Metal recyclers	7	132	139	1	20	21	14	15	15
TOTAL MRS	8	188	196	1	24	25	13	13	13
OVERALL TOTAL	25	223	248	14	38	52	56	17	21

Commentary

2.2.1 Table 1 demonstrates that the distribution of facility types and sizes i.e. the sample size, differs significantly between Metal Recycling Sites (MRS) and non-MRS sites. The ratio of non-MRS facilities classed as strategic against small is 1:2. Hence while an overall response rate for non-MRS facilities was 52%, the likelihood is that the proportion of the total waste treatment capacity in the region was accounted for was nearer 76%. That is to say the strategic facilities by definition handle a proportionately greater quantity of the total amount treated.

2.2.2 In contrast, the ratio of strategic to small MRS facilities is around 1:23. Discussions with major metal recycling companies revealed that the sector operates an established network of first, second and third phase supply chain facilities and that ultimately most ferrous metal, which represents the substantial mass of metal waste, will be delivered to the strategic facilities within or in the vicinity of the region.

2.2.3 The response rate achieved for non-MRS was significantly higher than for MRS. This is largely attributable to the difference in perception of operators of non-MRS facilities as being part of the waste management industry while MRS operators often do not consider

they are dealing with waste material and the metal recycling industry operates as a largely separate entity from the waste management sector. However, recently there has been some convergence between the metal recycling sector and the traditional waste management sector. This is due to the market opportunity created by the need to manage refrigeration equipment separately, in order to meet the requirements of the Ozone Depleting Substances Regulations. It can be expected that further convergence may occur around the WEEE Directive once this is implemented.

3.0 SURVEY RESULTS

3.0.1 The following sections detail the responses that were obtained from the survey as a whole.

3.1 Thermal Treatment

Response

3.1.1 Responses were received from four of the five municipal waste incinerators in the region, a metal smelter and an animal carcass facility. Non-respondents include:

A major MSW incinerator.

A clinical waste incinerator at a hospital.

A cement works operating tyre chipping and using tyres as a fuel substitute.

A plastics company operating a thermal oxidation unit for solvents and volatiles.

Inputs

3.1.2 A declared total of 910,966 tonnes was received in 2002/3 by thermal treatment facilities responding to the survey. When combined with estimated inputs for the non-respondents derived from Environment Agency data (142,600), an estimated 1,053,566 tonnes of waste was dealt with by thermal treatment within the West Midlands region in 2002/3. Total inputs for the principal types of waste managed through this method are shown in Table 2.

Figure 1 Thermal treatment facilities in the West Midlands Region

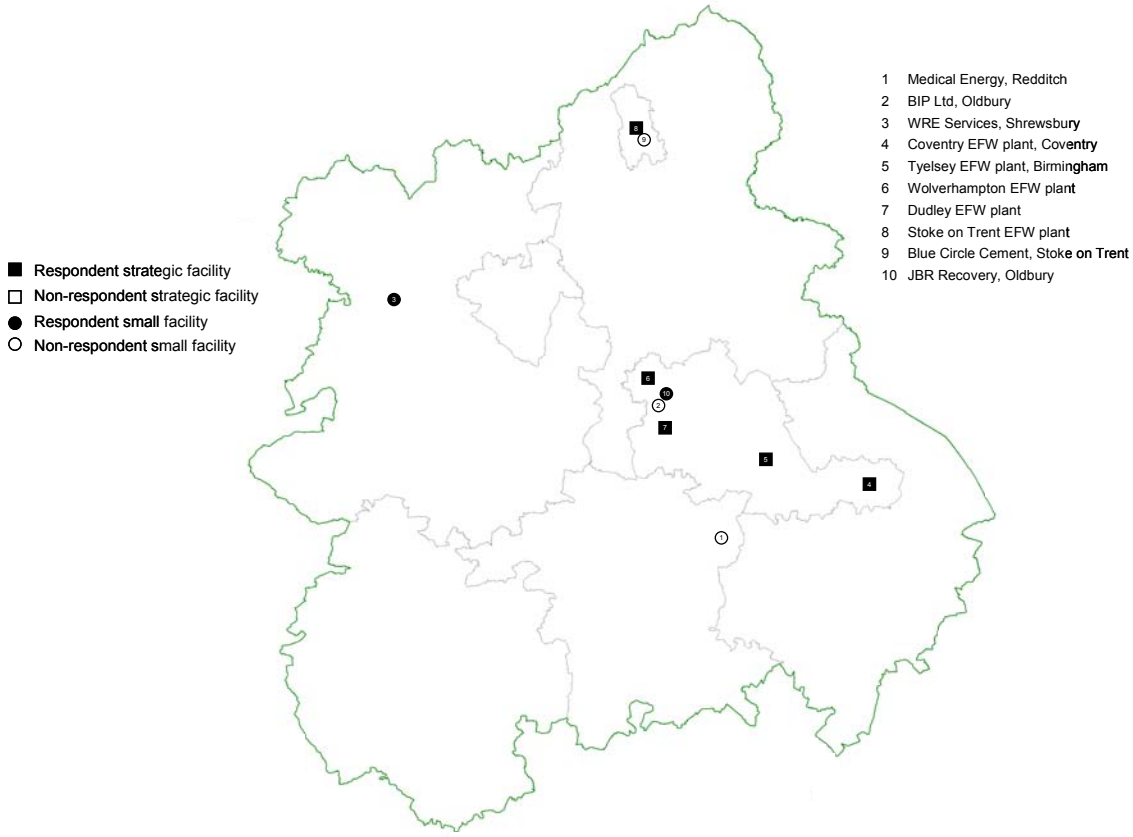


Table 2:Waste input to thermal treatment 2003 (tonnes)[1]

Type of waste	Special waste	Known inputs (respondents)	Known additional inputs (non-respondents)	Total estimated inputs
Animal carcasses	No	8,950	0	8,950
Municipal waste	No	877,100	90,000[2]	967,100
Clinical waste	No	5,400	0	5,400
Industrial/commercial waste	No	10,000	0	10,000
Paints, varnishes and inks	Yes	200	0	200
Chemical preparation waste	No	7,000	0	7,000
Other mixed waste	No	2,316	0	2,316
Solvents	Yes	0	12,600	12,600
Tyres	No	0	40,000	40,000
TOTAL		910,966	142,600	1,053,566

Commentary

3.1.3 Table 2 demonstrates that the majority of the thermal treatment capacity in the West Midlands Region is focussed on the incineration of MSW. The figure for total estimated MSW inputs broadly corresponds to the 944,000 tpa given in the DEFRA Municipal Waste Management Survey 2001/02 for waste arising within the West Midlands Region dealt with by EfW.

3.1.4 Total theoretical declared capacity amounts to 990,000 tpa (Environment Agency IPC Data) – but this may not take into account downtime or unscheduled stoppages. The total disguises the provision of more specialist treatment capacity available to deal with other flammable wastes. These in themselves make a significant contribution to treatment capacity for commercial and industrial and special waste within the region3.

[1] Numbers in brackets are EWC-Stat v2 codes

[2] This is the Dudley EfW plant

[3] The Environment Agency hazardous waste interrogator shows that in 2000, 1164 tonnes of special waste was dealt with through incineration (with and without energy recovery) within the region and that this all arose within the region.

Origin of wastes

3.1.5 Table 3 shows the origin of waste input. It is only possible to calculate this for the respondent facilities, hence the totals are less than reported in the previous table (i.e. Table 2 does not include the MSW incinerator that did not respond).

Table 3:Origin of waste input to thermal treatment facilities in the West Midlands Region 2003 (tonnes)

Origin of waste	Herefordshire	Shropshire	Staffordshire	Warwickshire	West Midlands	Worcestershire	TOTAL
Herefordshire	0	448 - Carcasses	0	0	4,700 - MSW 29 – Chemical prep. waste	0	5,177
Shropshire	0	5,818 - Carcasses	0	0	29 - Chemical prep. waste	0	5,847
Staffordshire	0	1,790 - Carcasses	194,500 - MSW/C&I 2,316 Other mixed waste	0	29 - Chemical prep. waste	0	198,635
Warwickshire	0	0	0	0	2,350 - MSW 29 - Chemical prep. waste	0	2,379
West Midlands	0	0	0	0	670,024 - MSW 5,346 - Clinical 9,800 - Commercial/ industrial 196 - Paints 204 - Chemical prep. waste	0	685,570
Worcestershire	0	0	0	0	29 - Chemical prep. waste	0	29
Outside region	0	895 - Carcasses	0	0	6,650 - Chemical prep. waste 5,526 - MSW 4 - Paints 200 - Commercial/ industrial 54 - Clinical	0	13,329
TOTAL		**8,951**	**196,816**		**705,20**	**0**	**910,968**

Commentary

3.1.6 Table 3 demonstrates that the bulk of MSW incineration capacity provided within the West Midlands Conurbation serves the conurbation itself with little waste imported into the Region (1.4% of respondents total waste is imported from outside the Region).

Changes in Throughputs

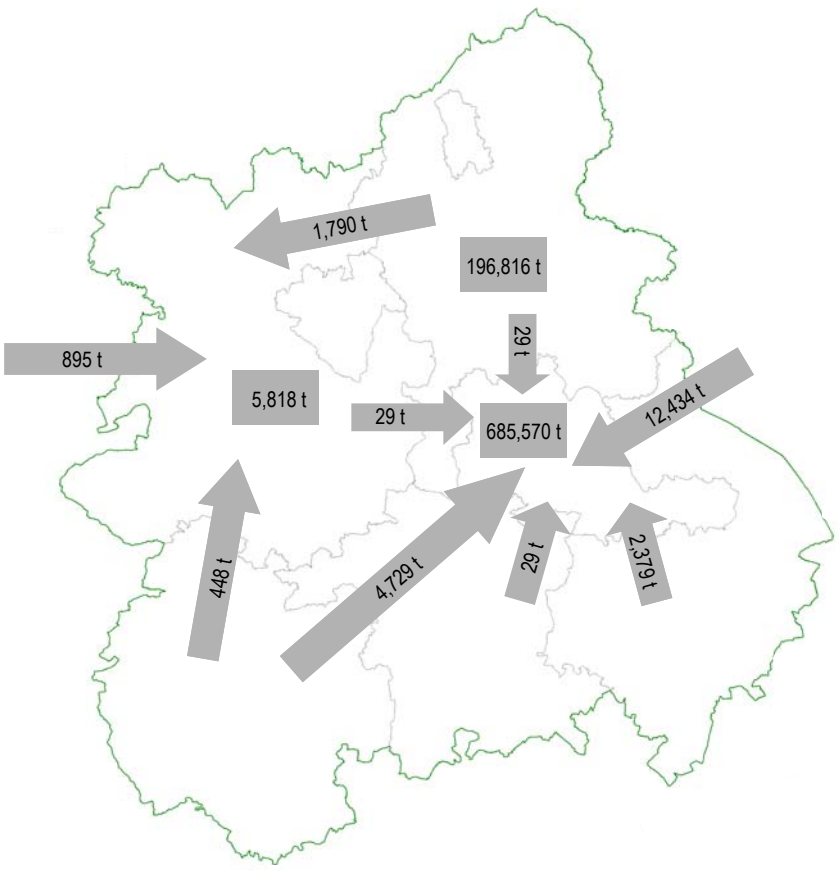
3.1.7 Comparing the overall picture with data for site throughputs derived from site returns presented for 2001 by the Environment Agency4 which came to light late in this study, it was found that throughput appears to have fallen although this has not been the case across all sub-regions. This fall could be attributed to the non-respondents to the survey and show that the availability of site returns data provides a helpful baseline to undertake capacity surveys for the future. The data is reproduced below:

Table 4:Throughput of incineration facilities 2001 and 2003 (000s tonnes)

Sub region / waste type	Total 2001	Total 2003	Difference
Herefordshire	-	-	
Shropshire	6	8.95	+2.95
Staffordshire	237	196.8	-40.2
Warwickshire	36	0	-36
West Midlands Metropolitan	717	704.8	-13
Worcestershire	7	0	-7
Total	1,003	910.55	-92.45

[4] Table WDN16: Throughput of incineration facilities in 000s tonnes West see Appendix 1

Figure 2 Waste movements to thermal treatment facilities 2003



Capacity

Table 5:Capacity of IPC authorised thermal treatment facilities in West Midlands Region (supplied by Environment Agency)

WPA	WASTE TYPE	ANNUAL AUTHORISED CAPACITY TONNES/YR	MUNICIPAL WASTE INPUT TONNES	IND/COMM WASTE INPUT TONNES	CLINICAL WASTE INPUT TONNES	SPECIAL WASTE INPUT TONNES	TOTAL INPUT TONNES
Worcestershire	Clinical Waste	13,000	46		6,534	474	7,054
Coventry	MSW[5]	252,000	180,152				180,152
Birmingham	MSW[5]	350,000	318,211				318,211
Dudley	MSW[5]	90,000	90,583				90,583
Wolverhampton	MSW[5]	98,000	105,705				105,705
Stoke-on-Trent	MSW[5]	200,000	200,632				200,632
Staffordshire	Sewage Sludge	14,000		3,500			3,500
Warwickshire	Sewage Sludge	36,000		36,000			36,000
Sandwell	Special	16,800		12,600			12,600
Shropshire	Animal Carcasses	14,000		5,829			5,829
Sandwell	Chemical	10,000		9,200		233	9,433
Staffordshire	Tyres	54,000		40,000			40,000
TOTAL		**1,147,800**	**895,329**	**107,129**	**6,534**	**707**	**1,009,699**

[5] The data on MSW incorporates a certain quantity of clinical waste, which has not been separated out.

Table 6:Estimated capacity for thermal treatment 2003 (tonnes)

Type of waste	Tonnes			
	Declared capacity (respondents)	Known additional capacity (non-respondents)	Total minimum capacity	Total available spare capacity
Municipal waste	877,100[6]	90,000	967,100	26,000[7]
Industrial/commercial waste	10,000	0	10,000	0
Other mixed waste	2,316[8]	0	2,316	0
SUBTOTAL	**889,416**	**90,000**	**979,416**	**26,000**
SPECIALIST INCINERATION				
Clinical waste	5,000	13,000[9]	18,000	7,000[10]
Animal carcasses	10,000	0	10,000	0
Paints, varnishes & inks[11]	200	0	200	0
Chemical preparation waste	10,000	0	10,000	3,000
Organic chemical wastes	0	17,000	17,000	4,400
SUBTOTAL	**25,200**	**30,000**	**55,200**	**14,400**
OTHER THERMAL				
Tyres	0	54,000	54,000	14,000[12]
TOTAL	**914,616**	**174,000**	**1,088,616**	**54,400**

[6] Stoke EfW return indicated that MSW and C&I were principal inputs but did not apportion input between them. Assumed to all be MSW.

[7] Figure derived from authorised capacity in Environment Agency IPC data table for MSW incinerators minus actual input derived from survey IPC data table indicates Tyesely and Coventry plants significantly under-utilised.

[8] Stoke EfW return

[9] Figure derived from Environment Agency data table for IPC authorised facilities, which give authorised capacity of 13,000 for Worcester shire. This is assumed to represent the clinical waste incinerator at Alexandra Hospital that was a non-respondent.

[10] Figure derived from authorised capacity minus actual input in Environment Agency IPC data table.

[11] The respondent that processes paints, varnishes and inks did not specify capacity for this waste stream, so this figure should be regarded as a minimum.

[12] Figure derived from authorised capacity minus actual input in Environment Agency IPC data table for Blue Circle site.

Commentary

3.1.8 For MSW the surplus capacity is the difference between the authorised capacity for the facility in Table 5 (Environment Agency IPC) data minus actual input derived from survey. There is a significant difference between the actual input and the authorised capacity for the Tyesely and Coventry plants. This may suggest that these facilities are under-utilised, that they have significant amounts of down time or for various reasons the capacity was over estimated at the time of authorisation.

3.1.9 The potential for movement of MSW for incineration may increase with the introduction of the Landfill Allowance Trading Scheme which could mean that the 70 ktpa spare capacity becomes contracted for use by other WDAs if this has not already been done.

3.1.10 For specialist incineration there appears to be significant surplus capacity and additional capacity at the cement kiln to accept more tyres as fuel. It is not clear what the constraints are on utilisation at present. Tyres and solvents can both be used by cement kilns and can be interchangeable. Solvents have a higher calorific value and therefore if their use was to be replaced by tyres a greater quantity of tyres would be required to provide the equivalent heat.

3.1.11 The main reasons given by respondents for existing capacity being under-utilised are shown in Table 7.

Table 7:Reasons for thermal treatment facilities operating below capacity (respondents only)

Type of waste	Spare capacity (tonnes)	Reason for spare capacity
Clinical waste	500	7. Not enough waste in the area
Chemical preparation waste	3,000	1. Not enough waste in the area 2. Waste goes to other places 3. Lack of end market

3.1.12 The majority of the reasons given ('waste going elsewhere' and 'not enough waste') may be attributable to low prices resulting from intense competition in the market place. None of the respondent facilities were 'closed gate' serving their own site alone where any theoretical spare capacity would not be practically available. This is a real issue for a company that is currently looking to contract out the operation of a thermal oxidation unit for solvents and volatiles for its own waste. This may result in a third party operator seeking to take in external waste as a commercial concern. This point may also be relevant to clinical waste incinerators on hospital sites.

3.1.13 Overall, the picture that has emerged suggests that the West Midlands Region's MSW incinerators are operating at or just above capacity depending on how you define this. There is spare capacity for some of the more specialist waste streams, namely animal carcasses, clinical waste, tyres and chemical waste. Spare capacity has been calculated using information supplied in the questionnaires for the respondents and for non-respondents by using other data sources supplied by the Agency. Either comparing waste inputs returns data with licensed capacity as determined by the Agency for charging purposes or declared capacity in IPC authorisations. Where spare capacity has been calculated on charging bands there may be reasons why this licensed capacity either cannot be used. It may even be an artefact of the Agency charging bands and may not exist in reality. Therefore it is not recommended to rely on this for future provision.

Outputs

3.1.14 A total of 251,171 tonnes of materials were declared outputs from the respondent sites in 2002/3. The results are shown in Table 8 below.

Table 8:Outputs from thermal treatment facilities in the West Midlands Region 2003 (tonnes)

Type of material	Management route	Declared quantity
Bottom ash	Final disposal	132,122
	Sold as product	90,226
	SUB TOTAL	211,063
Fly ash	Final disposal	19,447
	Further treatment	9,104
	SUB TOTAL	28,551
Metals	Further treatment	613
	Sold as product	9,544
	SUB TOTAL	10,157
Slag	Final disposal	1,400[13]
	TOTAL	251,171

Commentary

3.1.15 The prime source of declared outputs was from the MSW incinerators. One issue that will require further exploration when looking at future treatment capacity is the issue of the fate of fly ash – otherwise known as air pollution control residues. With the implementation of the Landfill Directive the disposal of these residues will become problematic. The waste is

[13] When combined with fly ash this figure broadly corresponds to EA HWI which gives 30k tpa of inorganic thermal process waste classed as special being produced in region for 2000.

identified as hazardous under the EU Hazardous Waste List and hence can only be disposed of to a hazardous waste landfill site.

3.1.16 After July 2004 when co-disposal of hazardous and non-hazardous waste must cease, the number of landfills accepting hazardous waste will significantly reduce. A further complication is that even at hazardous waste landfills there will be stringent waste acceptance criteria that are likely to be in operation from 2005. It is unlikely that APC residues can be disposed of in an untreated state and indeed the Directive requires all hazardous waste destined for landfill to be pre-treated from July 2004. Hence it is anticipated that a further demand for treatment capacity which may involve stabilization/solidification and encapsulation of the waste in a concrete or glass matrix will be created. Alternative treatments such as using the alkaline content of the residue to neutralise acid wastes are being investigated.

3.2 Biological treatment

Response

3.2.1 Responses were received from all five operational biological treatment facilities in the West Midlands Region. These included three composting sites and two sewage treatment works receiving controlled wastes with their locations shown in Figure 3 below.

Inputs

3.2.2 A declared total of 310,521 tonnes was received in 2002/3 by biological treatment facilities in the West Midlands region. This excludes both sewage treated at sewage treatment works and sewage sludge arising from sewage treatment works requiring further treatment. Total inputs for the principal types of waste managed through this method are shown below.

Table 9:Inputs to biological treatment facilities 2003 (tonnes)

Type of waste	Special waste	Inputs (tonnes)
Green waste	No	52,562
Food preparation waste/ waste food products	No	39,559
Aqueous organic/inorganic waste	Yes	218,400
TOTAL		310,521

Figure 3 Biological treatment facilities in the West Midlands Region

Commentary

3.2.3 In comparing the results in Table 9 with the information provided by the Environment Agencies Hazardous Waste Interrogator it would appear that biological treatment represents the most significant treatment route for over a third of the special waste produced within the region 14. This route would also appear to provide 90% of the special waste treatment capacity within the Region15 as detailed by the Waste Interrogator however this is not consistent with the results of the survey. It is likely that this is due to the changes that have occurred between the Waste Interrogator information being supplied to the Environment Agency and this survey being carried out.

3.2.4 The table identifies a significant quantity of food preparation waste/waste food products being treated through this route. However the introduction of the Animal By Products Order imposes restrictions on the reception and operation of facilities receiving and processing this waste if the ultimate outlet is to be to land. It is not clear how this might affect current provision but in 2006 retail food waste & food manufacturing waste is to be banned from landfill and this will mean there will be further demand for suitable treatment capacity.

Origin of waste

3.2.5 The table overleaf shows the origin of waste inputs.

[14] EA Hazardous Waste Interrogator gives total regional special waste arisings as 611.7k tonnes per annum.

[15] EA Hazardous Waste Interrogator gives total regional special waste treated within region as 238.8k tonnes per annum.

Table 10:Origin of waste input to biological treatment facilities in the West Midlands Region 2003

Origin of waste	Herefordshire	Shropshire	Staffordshire	Warwickshire	West Midlands Metropolitan	Worcestershire	TOTAL
Herefordshire	0	0	0	0	0	8,410 Green waste	8,410
Shropshire	0	0	0	0	295 Green waste 356 Food prep. waste 1,966 Aqueous waste	0	2,617
Staffordshire	0	0	0	0	5,316 Green waste 4,984 Food prep waste 27,518 Aqueous waste	0	37,819
Warwickshire	0	0	0	1,000 Green waste	1,424 Food waste 7,862 Aqueous waste	0	10,287
West Midlands Metropolitan	0	0	0	0	21,561Green waste 10,760 Food prep waste 59,405 Aqueous waste	0	91,726
Worcestershire	0	0	0	0	0	12,616 Green waste	12,616
Outside region	0	0	0	1,000 Green waste	2,363 Green waste 22,034 Food prep waste 121,649 Aqueous waste	0	147,046
TOTAL	0	0	0	2,000	287,495	21,026	310,521

Table 11:Waste deposited at biological treatment facilities 2000/2001 vs. 2003 (000s tonnes)16

Planning authority / waste type	Municipal	Industrial & Commercial	Total 2001	Total 2003
Herefordshire	-	-	**-**	**0**
Shropshire	-	23	**23**	**0**
Staffordshire	34	4	**38**	**0**
Warwickshire	-	104	**104**	**2**
West Midlands Metropolitan	-	41	**41**	**287.5**
Worcestershire	-	-	**-**	**21**
Total 2001	**34**	**172**	**206**	
Total 2003	**52.5**[17]	**258**		**310.5**

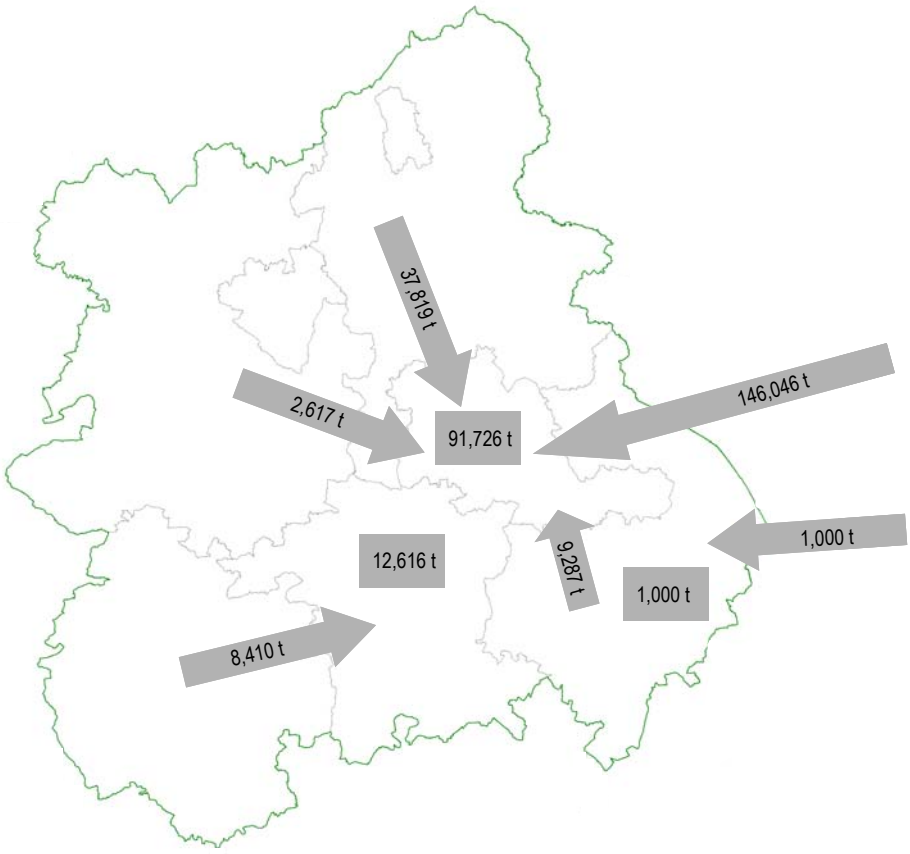
Commentary

3.2.6 Table 11 shows a comparison of waste deposited at the biological treatment plants from site return data for 2000/2001 with the data obtained from the survey. The comparison shows that while capacity has increased, as might be expected, the distribution of capacity has changed radically.

[16] Derived from Table WDN7-9 Waste deposited at biological treatment facilities 2000/2001 Environment Agency see Appendix 1

[17] Green waste taken as surrogate.

Figure 4 Waste movements to biological treatment facilities 2003



Commentary

3.2.7 Table 10 shows that the majority of food processing and aqueous waste (72%) dealt with within the West Midlands region is actually imported into the West Midlands conurbation. This might be anticipated as these are high value waste streams, which together with the provision of regionally significant facilities in the form of sewage treatment works and specialist facilities will have a significant influence on the movement of the waste.

3.2.8 This would not appear to accord with the proximity principle nor the aspiration of achieving regional self-sufficiency, however this does not take account of the many on-farm composting facilities that are exempt from obtaining a waste management license. These exempt site are likely to provide wider coverage and comply with the proximity principle but only treat green waste as they use open windrows. In addition the tight boundaries round the built-up areas of the metropolitan authorities may have a significant effect on the location of the facilities surveyed. It is therefore recommended that the provision of such facilities in adjacent regions and exempt facilities is assessed to establish the necessity for such significant movements. There is also some movement of green waste to composting facilities even though it might be expected that local authorities would make provision for composting in their own area as the value of this waste stream is not high.

Capacity

Table 12: Capacity of biological treatment facilities 2003 (tonnes)

Type of waste	Capacity	Total available spare capacity
Green waste	67,562	15,000
Food preparation waste/ waste food products	108,025	68,466
Aqueous organic/inorganic waste	606,374	387,974
TOTAL	**781,961**	**471,440**

Commentary

3.2.9 Overall, the picture that has emerged suggests that the West Midlands Region's biological treatment facilities have a significant amount of spare capacity. Composting facilities have 22% spare capacity. There is a spare capacity of 68% for the treatment of food waste and 64% for the treatment of aqueous waste.

3.2.10 This is consistent with feedback from the principal operator of treatment capacity for these wastes types that the plant is likely to undergo a rationalisation of treatment processes and technology to reflect changes in the market place. There is to be a greater focus on selective processing of problematic waste materials. Consideration is being given to refurbishment of the plant with respect to process efficiency, with an expected overall reduction in residue output.

3.2.11 Feedback from operators of composting facilities on capacity constraints and future plans. The Hill & Moor composting site in Worcestershire currently deals with all green waste from both Worcestershire and Hereford (circa 21,000 tpa). The site could only increase capacity with further capital investment in additional concrete hard standing and machinery. This is unlikely to happen since the composting takes place on a landfill site, and eventually the landfill will be full and the site will close.

3.2.12 This flags up an important consideration that treatment capacity co-located on landfill sites may well have lives limited to that of the host landfill and hence cannot be relied upon to be available indefinitely into the future. A new site may be sought in Hereford, to process green waste from Hereford. This may add a potential capacity of 7,000 tonnes. Another operator has been granted planning permission for a new composting site in Telford.

3.2.13 The total capacity figure of 1.249 million tonnes (781,961 tonnes from Table 12 plus 468,000 tonnes of sewage sludge) is consistent with the figure presented for 2000/01 in Table WCN4-9 on the Environment Agency website of 1.135 million tonnes.

Outputs

3.2.14 A total of 6,020,568 tonnes of materials were output from biological treatment sites in 2003. The results are shown in Table 13.

Table 13:West Midlands Region biological treatment facilities mass balance 2003

Type of waste/ material	Management route	Current Inputs (tonnes)	Quantity
Compost	Sold as product	52,562	32,383
	Beneficial use		2,000
Rejects from composting	Final disposal		5,327
Effluents	Disposal to sewer		5,533,840
Rejects from other biological treatment	Not known		40
Digestate	Further treatment	468,000	422,978
Landfill leachate	Disposal to sewer		26,000

Commentary

3.2.15 This table suggests that composting facilities are achieving an overall 25% reduction in total mass of waste input and a usable compost production rate of over 60%. This is in contrast to anaerobic digestion of sewage sludge that only appears to achieve a mass reduction of 10%.

3.3 Physical treatment

Response

3.3.1 Responses were received from eight of the twenty-one physical treatment facilities that are known to be operational, as shown in Figure 3. These include processors of oils, inert waste and wood packaging. Non-respondents include an operator based in the region with mobile plants designed to treat contaminated soil on production sites. These plants operate within and outside the region according to demand but are licensed at the registered office of the operating company. Hence while theoretically available to serve the region they may not actually be serving the region. Similarly operators of licensed mobile plants with registered offices outside the region will not have been surveyed but may be operating within the region and have capacity available if the market demand is present. Operators of crushing and screening plants authorised under Part B of the Environmental Protection Act 1990 were also surveyed where the plants might be used to process waste materials such as construction and demolition waste. Activities exempt from waste management licensing were not included in the survey.

Inputs

3.3.2 A declared total of 253,518 tonnes was received in 2002/3 by physical treatment facilities responding to the survey. When combined with estimated inputs for the non-respondents derived from Environment Agency data, an estimated 684,505 tonnes of waste was dealt with by physical treatment within the West Midlands region in 2002/3. Total inputs for the principal types of waste managed through this method are shown below.

Figure 5 Physical treatment facilities in the West Midlands Region

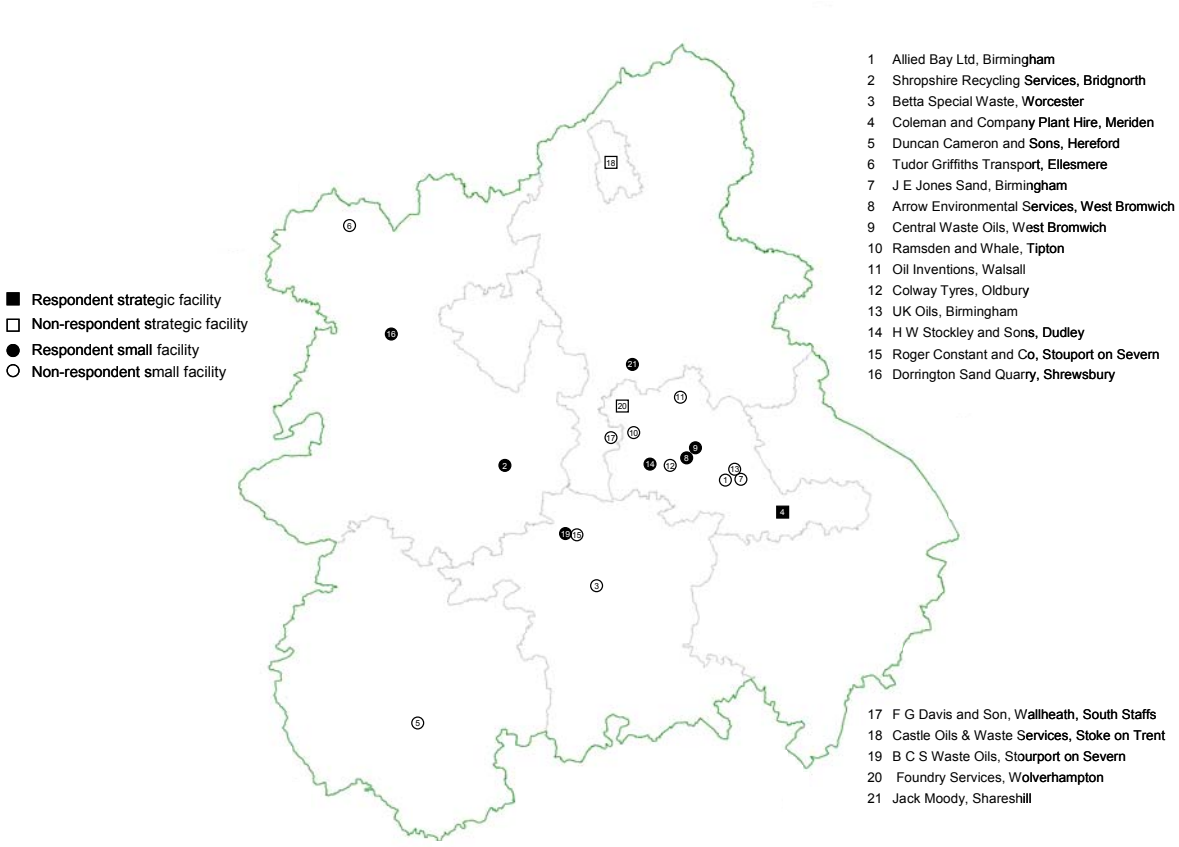


Table 14:Inputs to physical treatment facilities 2003 (tonnes) [18]

Type of waste	Special waste	Known inputs (respondents)	Known additional inputs (non-respondents)[19]	Total known inputs
Soil and rubble	No	100,000	130,000	230,000
Mixed construction & demolition waste	No	110,000	0	110,000
Wood packaging	No	75	50	125
Mixed packaging	Very small amounts	2,500	1,200	3,700
Used motor oils	Yes	34,000	16,060	50,060
Other used mineral oils	Yes	3,407	0	3,407
Sludges containing hydrocarbons	Yes	1,636	0	1,636
Oil/water mixtures	No	1,900	0	1,900
Tyres	No	0	40,000	40,000
Foundry sand	Dependant on contaminants	0	48,000	48,000
Non-differentiated waste stream			195,677	
TOTAL		253,518	430,987	684,505

[18] *Following facilities are not included in the table due to the lack of information.*

- *Betta Special Waste process not known.*
- *Inert waste processor.*
- *One mobile plant.*
- *Photographic chemical processor.*
- *Inert waste processor.*
- *F G Davis and Son Wallheath.*

[19] *Environment Agency data*

Commentary

3.3.3 Table 14 shows that the majority of the waste treated through physical methods are bulky wastes. The overall focus of physical treatment would appear to be to refine incoming waste streams for recovery and onward recycling. There is likely to be a direct link between the provision of facilities and the existence of legislative drivers. For the principal streams this would be:

- soil, rubble and C&D waste – avoided landfill tax and promotion of secondary aggregates through aggregates levy;
- packaging – availability of packaging waste recovery notes for recovered material including wood; and
- oil – waste oil directive promoting recovery and recycling. In essence the treatment of the waste has a market value whether it be through the production of a product of through avoided disposal costs.

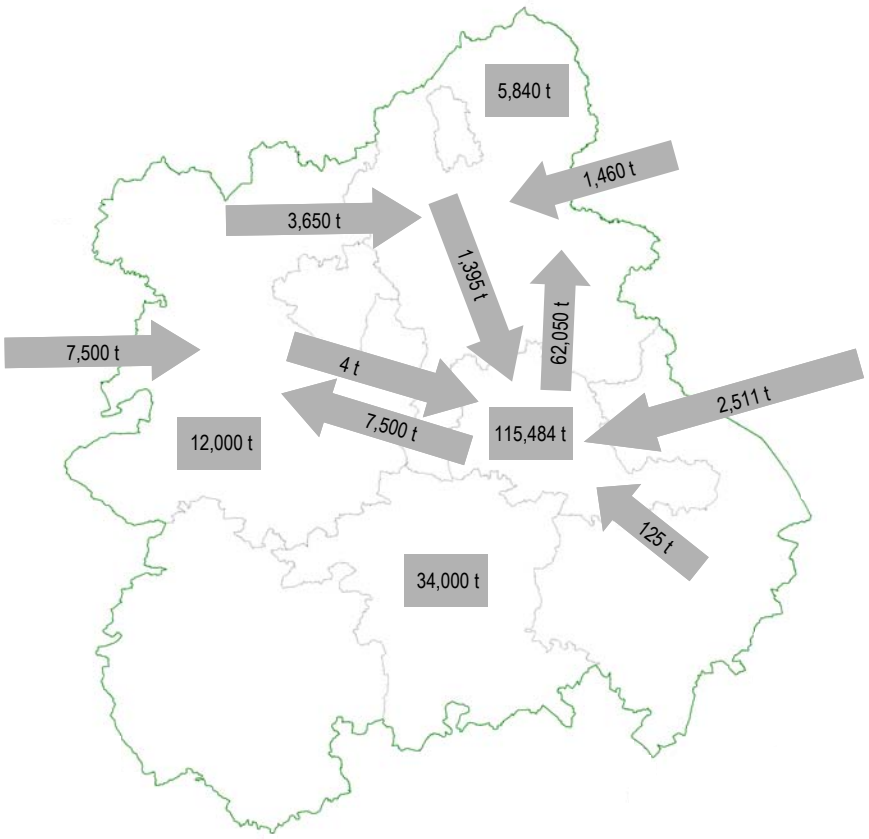
Origin of waste

3.3.4 Table 15 shows the origin of waste brought into the region. It is only possible to calculate this for the respondent facilities; hence the totals will be less than reported in the previous table.

Table 15:Origin of waste input to physical treatment facilities in West Midlands region 2003 (tonnes)

Origin of waste	Herefordshire	Shropshire	Staffordshire	Warwickshire	West Midlands	Worcestershire	TOTAL
Herefordshire	0	0	0	0	0	0	0
Shropshire	0	12,000 Soil/rubble	3,650 Soil/rubble	0	4 Wood packaging	0	15,654
Staffordshire	0	0	5,840 Soil/rubble	0	760 Oil/water 6 Wood packaging 504 Oils and oily sludges 125 Mixed packaging	0	7,235
Warwickshire	0	0	0	0	125 Mixed packaging	0	125
West Midlands	0	7,500 Soil/rubble	62,050 Soil/rubble	0	3,530 Oils and oily sludges 1,140 Oil/water 750 Mixed packaging 110,000 C&D waste 64 Wood packaging	0	185,034
Worcestershire	0	0	0	0	0	34,000 Motor oil	34,000
Outside region	0	7,500 Soil/rubble	1,460 Soil/rubble	0	1,500 Mixed packaging 1,009 Oils and oily sludges 2 Wood packaging	0	11,471
TOTAL	0	27,000	73,000	0	119,519	34,000	253,519

Figure 6 Waste movements to physical treatment facilities 2002/3



Commentary

3.3.5 Table 15 shows that while the West Midlands conurbation serves most of the Region, Shropshire provides the only other capacity of respondents for soil/rubble. This represents nearly 12% of the regional capacity for the soil/rubble waste stream. In view of the weight of the waste stream and its relatively low value it is perhaps surprising that over half of the inputs to that County come from outside the County and over a quarter comes from outside the region.

Capacity

3.3.6 There would appear to be spare physical treatment capacity in the West Midlands Region across all types of activity with all but two of the eight sites' capacity being under utilised in 2002/3. The market appears to be sufficiently developed for operators to invest in treatment capacity but either competition for waste is strong or further needs have been anticipated. This is shown by waste type in Table 16. In addition there are a number of mobile plants treating soil and rubble, which do not report their activities.

Table 16:Capacity of physical treatment facilities 2003 (tonnes)

Type of waste	Tonnes			
	Known capacity (respondents)	Known additional capacity (non-respondents)	Total minimum capacity	Total available spare capacity
Soil and rubble and C&D waste	259,000	130,000	389,000	49,000
Packaging	3,575	1,200	4,775	1,000
Tyres	0	57,000[18]	57,000	0
Oils, oil/water mixtures and oily sludges	83,443	16,060	99,503	42,500
Wood	0	50	50	0
Foundry sand	0	48,000	48,000	0
TOTAL	**346,018**	**252,310**	**598,328**	**92,500**

[18] The Blue Circle cement kiln operates a tyre chipping plant to prepare tyres prior to burning. Kiln capacity is 54 ktpa with 40k tpa being used. So it has been assumed that the tyre chipper can process 40k tpa. In addition this also now includes another tyre plant processing 17,000 tonnes.

3.3.7 The main reasons given by respondents for existing capacity being under-utilised are shown in Table 17 below.

Table 17:Reasons for facilities operating below capacity

Type of waste	Spare capacity (tonnes)	Reason for spare capacity
Soil and rubble and C&D waste	27,000	1. Not enough space
Packaging	1,000	1. Lack of an end market
Oils, oil/water mixtures & oily sludges	42,500	1. Not enough waste in the area 2. Waste going to other places
TOTAL	92,500	

3.3.8 Feedback from a number of plant operators was that regulatory uncertainty was delaying the creation of a reliable market for treatment methods targeted at hazardous wastes.

3.3.9 One operator would like to increase capacity for aggregate processing but anticipates regulatory resistance so has gone for composting first.

3.3.10 Regulatory restraints (regarding whether recycled aggregates are a 'waste' stream) have resulted in another secondary aggregates production facility not being utilised to the full of its capacity. However, the company's business plan is to expand in the West Midlands, eventually operating 3 aggregate recycling sites in the Region. A new 6-acre site has been acquired which will be used for aggregate recycling (washed, Type 1 aggregate) with an estimated annual waste acceptance of 100,000 tpa. This site is planned to begin operating in 2004.

3.3.11 The capacity for the treatment of C&D waste is likely to be under-reported due to a large number of mobile plants which being Part B processes do not have to provide returns detailing the quantity of waste treated.

3.3.12 An operator of a mineral oil and hydro-carbon sludge separation/purification facility would like to increase sites throughput by moving to 24 hour processing but is constrained by its current licence which restricts the hours that processing can be carried out to daytime only.

Outputs

3.3.12 A total of 253,574 tonnes of materials were declared outputs from the respondent sites in 2002/3. Table 18 compares outputs with declared inputs.

Table 18:Mass Balance for physical treatment facilities in West Midlands Region 2003 (tonnes)

Type of waste	Input	Declared quantity	Management route
Secondary aggregates	210,000	26,000	Final disposal
		37,000	Sold as product
Soil forming materials		36,500	Sold as product
C&D waste		110,000	Final disposal
Ferrous metals		500	Reuse/recovery
Granulated/chipped/shredded inorganic waste	75	75	Sold as product
Oils	39,307	1,129	Recovery/reuse
		34,000	Sold as product
Solvents		20	Further treatment
		20	Recovery/reuse
Containers		2020	Recovery/reuse
Spent filtration and absorbent materials		1	Final disposal
Sludges containing hydrocarbons		483	Final disposal
Sludges from industrial processes		600	Further treatment
Effluent		6,726[20]	Sewer Discharge
TOTAL		255,074	

Commentary

3.3.13 Aggregating the outputs and relating them to the facility inputs gives a clear picture of efficiency of the different physical processing methods used. In the case of heavy

[20] The addition of water creating effluent that is disposed to sewer means that the outputs do not equal the inputs.

materials 35% of the input is being diverted from landfill for higher grade recycling (not including 'recovery' through use in the licensing exemptions). A 100% recycling rate is achieved for packaging recycling and a 95% recovery/recycling rate is achieved through oil treatment. However in the latter case a significant proportion of additional effluent is created requiring disposal and a number of streams need to go on for further treatment which will add to the costs of the overall process.

3.4 Chemical/Physico-Chemical Treatment

Response

3.4.1 Responses were received from seven of the 14 chemical and physico-chemical facilities operating in the West Midlands region. However, only four of these provided sufficient information to be included in the results. The three that did not provide sufficient information included two physico-chemical facilities, one of which is very large, and a mobile plant. Non-respondents include three physico-chemical facilities, two chemical treatment plants and two materials recycling treatment facilities.

Inputs

3.4.2 A declared total of 155,693 tonnes was received in 2002/3 by chemical/physico-chemical treatment facilities responding to the survey. When combined with estimated inputs for the non-respondents derived from Environment Agency data, an estimated 177,060 tonnes of waste was dealt with by chemical/physico-chemical treatment within the West Midlands region in 2002/3. The data from the Environment Agency does not cover all of the non-respondents as highlighted by the footnote to Table 19. Total inputs for the principal types of waste managed are shown below.

Figure 7 Chemical/physico-chemical treatment facilities in the West Midlands Region

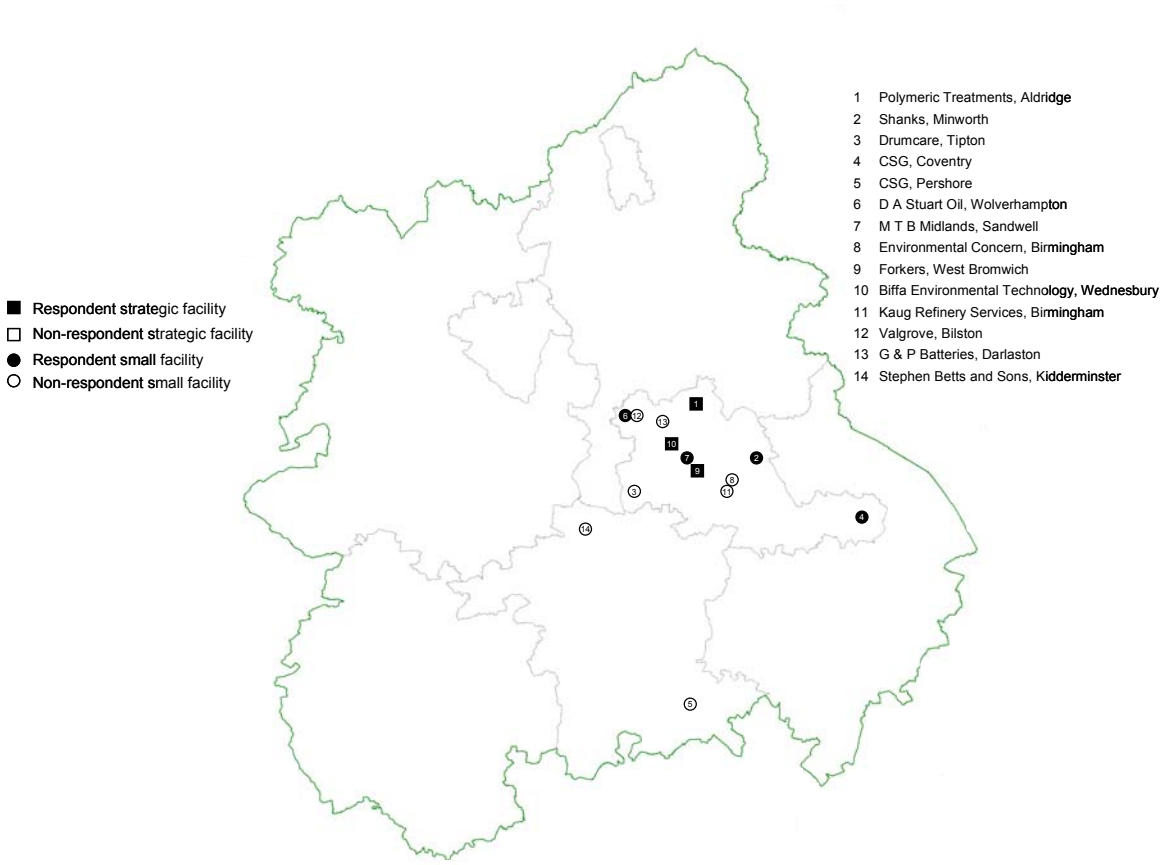


Table 19:Inputs to chemical/physico-chemical treatment facilities 2003 (tonnes)[21]

Type of waste	Special waste	Known inputs (respondents)	Known additional inputs (non-respondents)	Total inputs
Alkali wastes	Yes	25,000	716	25,716
Acidic waste	Yes	17,0000	406	17,406
Salts & aqueous inorganic wastes	Yes	15,000	3,059	18,059
Oxidising agents	Yes	500	0	500
Chemical reaction residues	Yes	7,000	885	7,885
Sludges containing hydrocarbons	Mostly	8,000	0	8,000
Other sludges from industrial processes and effluent treatment	Mostly	28,000	2,268	30,268
Metal solutions	Yes	10,000	0	10,000
Paints/ varnishes/ inks	Yes	11,500	34	11,534
Motor oils	Yes	500	26	526
Other oils	Mostly	12,193	0	12,193
Oil/water mixtures	Yes	0	871	871
Solvents	Yes	1,000	113	1,113
Landfill leachate	Yes	20,000	0	20,000
Empty containers	Yes	0	746	746
Batteries	Yes	0	9,899	9,899
Asbestos	Most	0	7	7

[21] *Following facilities are not included in the table due to the lack of information.*

Polymeric treatments

Whelan Environmental Services

Biffa in Walsall

Kaug Refinery

Valgrove

Stephen Betts and Sons)

Type of waste	Special waste	Known inputs (respondents)	Known additional inputs (non-respondents)	Total inputs
Fridges and freezers	Parts	0	576	576
WEEE	No	0	34	34
Other metals	No	0	77	77
Laboratory smalls	Yes	0	2	2
Powders	Unknown	0	66	66
Pharmaceuticals	Unknown	0	111	111
Plastics	No	0	34	34
Tyres	No	0	40	40
Wood treatment chemicals	Yes	0	292	292
Other	Some	0	1,105	1,105
TOTAL		**155,693**	**21,367**	**177,060**

Commentary

3.4.3 Unsurprisingly this method of treatment is focussed on high value waste streams, primarily special wastes. The demand for this capacity can be expected to increase due to: the ban on disposal of hazardous liquids to landfill already in place; the imminent banning of non hazardous liquid disposal to landfill; the cessation of co-disposal; and the need to stabilise wastes such that the Landfill Directive Waste Acceptance Criteria are met as well as long term liabilities being acceptable to the industry,.

Origin of waste

3.4.4 The table below shows the origin of waste brought into the region. It is only possible to calculate this for the respondent facilities; hence the totals are less than reported in the previous table.

Table 20:Origin of waste input to chemical/physico-chemical treatment facilities in the West Midlands Region 2003

Origin of waste	Herefordshire	Shropshire	Staffordshire	Warwickshire	West Midlands Metropolitan	Worcestershire	TOTAL
Herefordshire	0	0	0	0	7,493	0	7,493
Shropshire	0	0	0	0	7,183	0	7,183
Staffordshire	0	0	0	0	8,113	0	8,113
Warwickshire	0	0	0	0	8,113	0	8,113
West Midlands Metropolitan	0	0	0	0	88,188	0	88,188
Worcestershire	0	0	0	0	8,113	0	8,113
Outside region	0	0	0	0	28,493	0	28,493
TOTAL	**0**	**0**	**0**	**0**	**155,696**	**0**	**155,696**

Commentary

3.4.5 The region appears to be largely self sufficient in capacity with 18% of inputs received from outside the region.

3.4.6 The survey returns compare with the Environment Agency site return summary for 2000/2001 as shown in the table below.

Table 21:Waste deposited at chemical/physico-chemical treatment facilities in 2000/2001 vs. 2003 (000s tonnes) including physical treatment (Table 13 & 14)[19]

Planning authority / waste type	Inert/C&D	Municipal	Industrial & Commercial	Special	Total 2001	Total 2003[20]
Herefordshire	-	-	-	-	**-**	**-**
Shropshire	48	-	-	-	**48**	**27**
Staffordshire	57	13	83	16	**169**	**-**
Warwickshire	-	-	5	-	**5**	**-**
West Midlands Metropolitan	201	-	155	309	**665**	**348**
Worcestershire	-	-	4	10	**14**	**34**
Total 2001	**306**	**13**	**247**	**335**	**901**	
Non-respondents						**264**
Total 2003[21]	**340**		**103**	**230**		**673**

Commentary

3.4.7 Comparing the figures and also cross referring to Table 27 in the conclusion (which gives an overview of the site returns calculation the following explanations and observations can be made:

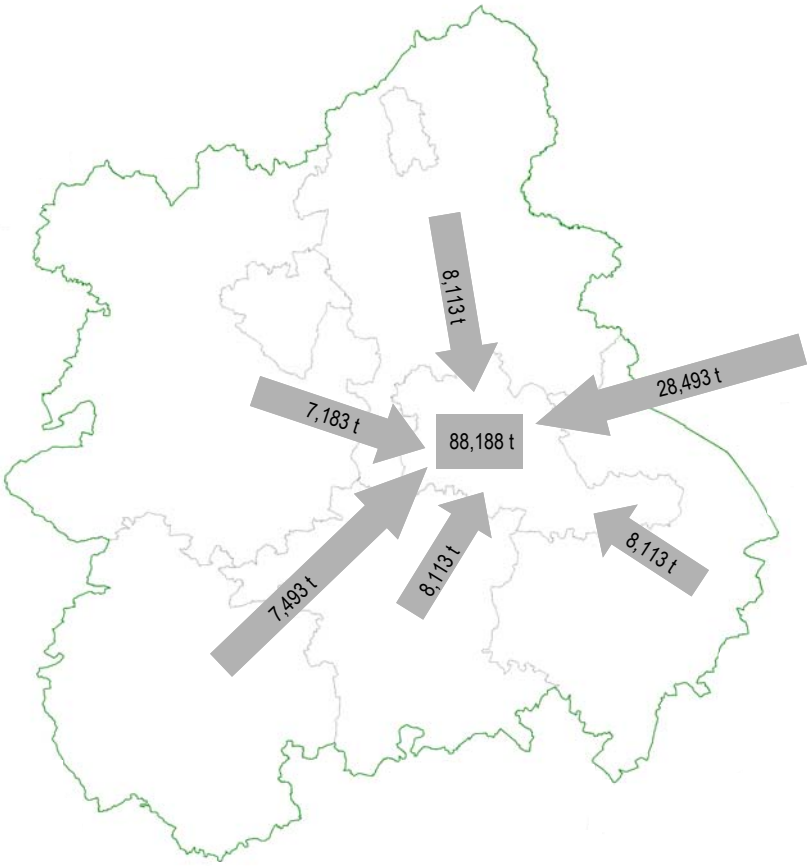
- The figures for inert waste are reasonably consistent indicating a rise in quantities treated.
- The lack of an entry for municipal waste for 2003 is likely to be due to the omission of Material Recovery Facilities (MRFs) from the survey.
- The omission of MRFs from the survey would account for some of the reduction in quantity of Commercial and Industrial waste, approximately 82,000 tonnes.
- Site returns data suggests, surprisingly, that 110,000 tonnes of special waste was dealt with at MRFs and only 1,000 tonnes were dealt with by chemical means. The remaining 224,000 tonnes were dealt with by physical treatment. This makes the data far more comparable.
- There are significant deviations with respect to sub regional distribution of capacity, however is it not known to what extent this is due to the lack of data from non-respondents.

[19] Derived from Table WDN8-9 Waste deposited at physico-chemical treatment facilities in 2000/2001 Environment Agency see Appendix 1. It should be noted that this table includes physical treatment and therefore will not correlate with Table 20 that only includes chemical/physico-chemical facilities.

[20] Aggregating sub regional total Table 14 and Table 19

[21] Aggregating total known from Table 13 and Table 18

Figure 8:Waste movements to chemical/physico-chemical treatment facilities 2003



Capacity

3.4.8 Overall, the picture that has emerged suggests that the West Midlands Region's chemical and physico-chemical facilities are operating below capacity. However it is difficult to be certain due to the low response. Table 22 below shows the available and spare capacity for each type of waste managed. The fact that many facilities dealing with reactive chemicals need to maintain a 'reserve' capacity for operational purposes, needs to be taken into account. This is primarily to store materials prior to use as reactants. In addition capacity is not interchangeable between waste streams and hence additional capacity to deal with specific waste streams may be required.

Commentary

3.4.9 Capacity provision for the Region is made almost solely by the West Midlands conurbation. While the centrality of the conurbation may be advantageous from a connectivity point of view when combined with the analysis for previous treatment methods it would appear that the region is excessively dependant on this one area. Review of special waste arisings data on an area-by-area basis might support this but it is suspected that the presence of such a concentration of capacity in a single area may be more a function of the historical development of industry in Birmingham. It is also possible that the large integrated facilities are sited to have the greatest catchment area to reduce the risks associated with such high cost plants. It is known that a number of such plants have closed due to the investment required to meet regulatory change.

Table 22:Capacity in chemical/physico-chemical treatment facilities 2003 (tonnes)

Type of waste	Tonnes	
	Known capacity (respondents)	Total available spare capacity
Alkali wastes	30,000	5,000
Salts and aqueous inorganic wastes	20,000	5,000
Chemical reaction residues	10,000	3,000
Sludges containing hydrocarbons	12,895	4,895
Other sludges from industrial processes and effluent treatment	34,895	6,895
Oxidising agents	1,000	500
Metal solutions	15,000	5,000
Paints/ varnishes/ inks	12,816	1,000
Motor oils	1,500	1,000
Other oils	15,088	2,895
Solvents	2,000	1,000
Mineral acids	22,000	5,000
Landfill leachate	20,000	0
TOTAL	197,194	41,185[22]

[22] This is likely to be an underestimation due to the absence of data from non-respondents (see footnote to Table 19).

3.4.10 The main reasons given by respondents for existing capacity being under-utilised are shown in Table 23 below.

Table 23:Reasons for facilities operating below capacity

Type of waste	Spare capacity (tonnes)	Waste goes to other places	Not enough waste in the area
Alkali wastes	5,000	√	√
Salts and aqueous inorganic wastes	5,000	√	√
Chemical reaction residues	3,000	√	
Sludges containing hydrocarbons	4,895	√	√
Other sludges from industrial processes and effluent treatment	6,895	√	√
Oxidising agents	500	√	
Metal solutions	5,000	√	√
Paints/ varnishes/ inks	1,316	√	√
Motor oils	1,000	√	
Other oils	2,895	√	√
Solvents	1,000	√	
Mineral acids	5,000	√	
Landfill leachate	0		Not known
Total	41,501		

Commentary

3.4.11 All the reasons given ('waste going elsewhere' and 'not enough waste') may be attributable to low prices resulting from intense competition in the market place and the continued availability of direct landfill.

Outputs

3.4.12 A total of 2,778,130 tonnes of materials were declared outputs from the respondent sites in 2002/3. This quantity, which is far greater than the inputs, results from the addition of water with subsequent disposal to sewer. The results are shown in Table 24 below.

Table 24:Outputs from chemical/physico-chemical treatment facilities in the West Midlands Region 2003 (tonnes)

Type of waste	Management route	Declared quantity
Salts or aqueous inorganic waste	Sold as product	250
Solvents	Reuse/recycling	1,000
Oils	Reuse/recycling	3,500
	Further treatment	23
Sludges containing hydrocarbons	Further treatment	6,000
Effluent discharges to sewer	Treatment prior to disposal	70,157
Contaminated packaging	Final disposal	50
Mineral acids	Final disposal	100
Spent filtration and absorbent materials	Final disposal	50
Filter cakes	Final disposal	21,000
Stabilised or solidified wastes	Final disposal	3,800
Chemical reaction residues	Not known	2,000
TOTAL		**107,930**

Commentary

3.4.13 This Table shows that the prime intention of physico-chemical treatment is to reduce the hazardous nature of wastes and improve their manageability. Their prime focus is on pre-treatment of waste prior to disposal, whether by landfill (solids) or to sewer (liquid effluents).

3.5 Metal Recycling Facilities

Response

3.5.1 Responses were received from 5 of the 57 licensed vehicle dismantlers and 20 of the 139 licensed mixed metal recyclers. Due to the poor response rate it was agreed not to report on the responses received in detail since they would not give a representative view of activities carried out within the region. Inquiries were however made of the principal operators within the region and the following information was ascertained.

Inputs

3.5.2 There is an extensive supply chain for metal recycling that extends beyond the West Midlands planning region. There are two fragmentiser plants operating in the West Midlands and they are the top of the supply chain. The EMR plant in Birmingham deals with around 330,000 tpa input producing 250,000 tpa output for recovery with remainder landfilled. Dunns Brothers operate a 50,000 tpa input machine in Birmingham producing approximately 35ktpa output for recovery and remainder landfilled. Thus total top tier treatment capacity for ELVs and white goods in the region is around 380,000 tpa input. Of this 58% (193,000 tpa) is estimated to be utilised for ELV and the rest is white goods other than fridges, which are dealt with separately through two fridge reprocessing plants which degas and shred.

3.5.3 Based on this information it might be reasonable to assume that around 450,000 tpa of ELV and white goods arise within the Region of which 58% is ELVs i.e. 261,000 treatment capacity.

3.5.4 Heavy ferrous metal is dealt with by multiple operators with shears and will tend to go direct to smelters. Because they are dealing with a material with a commodity value and operate plants whose viability are throughput dependent it is not uncommon for metal waste to travel extensively. There are at least 6 other smaller fragmentiser in the vicinity of the region) that draw scrap to them from the Region. Conversely scrap may also be drawn from outside the region.

Capacity

3.5.5 Overall, the picture that has emerged is that the region has spare capacity both for processing end of life vehicles and for metal recycling. This has been confirmed by representatives of the metal recycling industry who consider there is over capacity of fragmentation and fridge processing plant in the region (C Iles EMR Pers Comm). As a general point EMR, the dominant market player, has stated it would not look to expand operations by developing new sites but would grow by acquisition of existing sites if needed. Therefore it does not see participating in the waste planning process as being relevant to its operations. This however disguises the problem of the potential shortfall in de-pollution capacity on local vehicle dismantling yards.

3.5.6 Few of the operators contacted indicated their intention to seek the necessary permit as a de-pollution facility rather relying on others to de-pollute prior to vehicles being accepted or reverting to dealing with other metal. One operator did signal their intention to expand into vehicle dismantling (only engine dismantling is undertaken at the moment). However, they are awaiting further guidance. A new yard has been acquired and new furnace technology is to be deployed so that non-ferrous materials can fuel the furnace.

Outputs

3.5.7 Since the project was initiated site returns data for the region has become available for 2000/1 and this is reproduced in Table 26.

Table 25:Waste deposited at metal recycling facilities in 2000/2001 (000s tonnes)[23]

	Birmingham	Coventry	Dudley	Sandwell	Solihull	Walsall	Wolverhampton	Stoke-on-Trent	Telford & Wrekin	Herefordshire	Shropshire	Staffordshire	Warwickshire	Worcestershire	**Total**
Inert/C&D	-	1	-	-	-	-	9	-	-	-	-	-	-	-	**10**
Industrial & commercial	544	74	179	514	-	153	35	10	11	63	33	43	62	82	**1,803**
Special	-	-	-	-	-	-	-	-	-	-	-	-	-		**-**
Total	**544**	**75**	**179**	**514**	**-**	**153**	**44**	**10**	**11**	**63**	**33**	**43**			**1,813**

3.5.8 The site returns data above captures operators of facilities that occupy different places in the metal recycling supply chain so there is significant double counting particularly around ELVs and ferrous metal. Hence it is suggested that the treatment capacity figure should be largely based on installed capacity for fragmentisers as discussed previously and the recovery rate back calculated as described.

3.5.9 Fragmentiser waste is classed as non-hazardous and is being subjected to increasing sorting with significant investment to reduce the residue going to landfill to an absolute minimum. Top tier operators are looking to maximise recovery from the waste streams – glass, plastics and foam are now recovered for recycling. There is also a greater focus on developing manual processing.

[23] Derived from Table WDN11 – Waste deposited at metal recycling facilities, Environment Agency see Appendix 1

4.0 SUMMARY & CONCLUSION

4.0.1 During the course of this project site returns data, for 2000/01 have been published by the Environment Agency. These have been used to 'ground truth' the data obtained wherever possible even though the data is not always directly comparable.

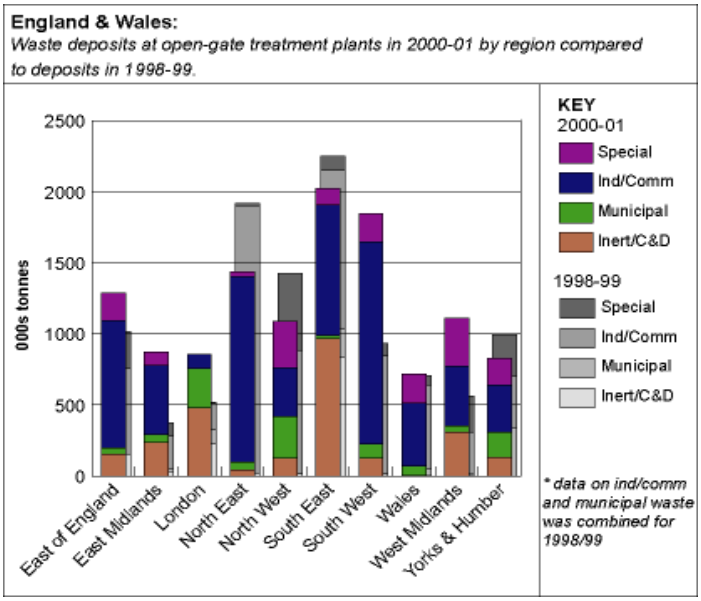
4.0.2 The Environment Agency website provides some commentary on the trends in treatment capacity between 1999 and 2000/01 on a national basis as follows:

- treatment inputs fell by 1.7m tonnes (13%)
- inert/C&D waste inputs increased by 30% (nearly 0.5 m tonnes)
- inputs of both special (hazardous) waste and non-hazardous biodegradable waste fell by around 20%.

4.0.3 However there were quite marked regional variations:

- significant increases in capacity - between 60% and 90% - in East Midlands, South West, and West Midlands
- smaller increases in capacity in London and East of England
- a reduction in capacity of 25% (0.7m tonnes) in South East - the region which treats most waste
- large percentage reductions in capacity (up to 40%) in North East, North West, and Yorks & Humber.

4.0.4 The graph below shows a significant rise in treatment capacity within the West Midlands region to just over a million tonnes, although it is not entirely clear where the change has occurred with regard to specific waste streams. It appears that special waste treatment capacity has grown slightly, that municipal waste and industrial commercial waste treatment has also grown but that the most significant rise is in the provision of treatment capacity for inert/C&D waste.



4.0.5 This may be useful as a guideline when considering the 2003 data obtained by this project to see if these trends are reflected in the most recent data.

4.1 Waste Deposits

Table 26: Site return data for waste deposited at open gate treatment facilities in 2000/2001 (000s tonnes) [21]

Description	Inert/C&D	Municipal	Industrial & Commercial	Special	Total
Incineration	-	895	68.5[22]	-	**963.5**
Composting	-	34	-	-	**34**
Biological treatment	-	-	127	-	**127**
Physical/chemical treatment	281	-	159	225	**665**
TOTAL NON MRF/NON MRS	**281**	**942**	**354.5**	**225**	**1,802.5**
Materials recycling facility	24	13	82	111	**230**
TOTAL WITH MRF	**305**	**955**	**436.5**	**336**	**2032.5**

Table 27:Waste deposited at open gate treatment facilities in 2003 (000s tonnes)

Description	Inert/C&D	Municipal	Industrial & Commercial	Special	Total
Incineration	-	967	74	13	**1,054**
Composting	-	53	-	-	**53**
Biological treatment	-	-	92	218	**310**
Physical/chemical treatment	340	-	103	230	**673**
TOTAL EST TREATED 2003	**340**	**1020**	**269**	**461**	**2090**

Commentary

4.1.1 Comparison of deposit data for 2000/01 (excluding MRFs) and 2003 shows an increase of around 16% in total quantity of waste treated within the region. That is 1,802.5 tonnes deposited at treatment facilities in 2000/1 compared with 2,090 tonnes in 2003.

4.1.2 Treatment has grown in all major streams (inert/C&D + 21%, MSW + 8%, Special Waste +105%) with the exception of Industrial and Commercial waste, which has fallen by 24%. Industrial and Commercial waste and Special Waste tends to be inter-related with wastes often falling out of one category into the other depending on how the headings are defined. If these categories are combined the overall increase is 26%.

[21] Derived from Table WDN9-8 Waste deposited at open gate treatment facilities in 2000/2001 (000s tonnes) see Appendix 1

[22] Excluding 39.5 ktpa of sewage sludge incineration capacity.

4.1.3 The quantity of special/hazardous waste requiring treatment is likely to increase significantly in 2004/5 due to the reduction in landfill sites able to take hazardous waste and the introduction of legislation defining waste as hazardous which will be more expansive that the previous Special Waste definition.

4.2 Capacity

4.2.1 The Environment Agency website only gives capacity data by Waste Planning Authority within the region, whereas this project collected capacity data by waste stream and activity. It is not clear how the Agency has distinguished between deposits and capacity although the difference in figures is considerable. While the data is not directly comparable it is possible to arrive at aggregated results from which some comparisons can be made.

Table 28:Capacity at open gate treatment facilities in 2000/2001[22]

Sub-region / site type	Inert	Non-inert	Special	**Total**
Herefordshire	-	-	-	**-**
Shropshire	25,000	52,000	-	**77,000**
Staffordshire	-	2,402,000	180,000	**2,582,000**
Warwickshire	-	331,000	-	**331,000**
West Midlands Metropolitan	406,000	146,000	1,093,000	**1,645,000**
Worcestershire	-	-	28,000	**28,000**
Total	**431,000**	**2,931,000**	**1,301,000**	**4,663,000**
MINUS MRF (deposits) & SS incineration	24,000	145,000	111,000	
TOTAL EXCLUDING MRF	**407,000**	**2,786,000**	**1,190,000**	**4,388,000**

[22] Derived from Table WCN6-8 Capacity at open gate treatment facilities in 2000/2001 (000s tonnes) Environment Agency see Appendix 1

Table 29:Capacity at open gate treatment facilities in 2003

Description	Inert/C&D	Municipal	Industrial & Commercial	Special	Total
Thermal – general		979,416			
- specialist	-		28,000	27,200	
- other			54,000		
SUB TOTAL		979,416	82,000	27,200	**1,088,616**
Biological treatment - composting		67,562			
- other			108,025	606,374	
SUB TOTAL		67,562	108,025	606,374	**781,961**
Physical/chemical - physical	389,000	-	109,825	99,503	
- physico-chemical				197,194	
SUB TOTAL	389,000	-	109,825	296,697	**795,522**
TOTAL EST CAPACITY	**389,000**	**1,046,978**	**299,850**	**930,271**	**2,666,099**

Commentary

4.2.2 This data suggests there has been a significant fall in treatment capacity since 2001 with a capacity of 4.39 Mtonnes in 2000/1 compared with 2.67 Mtonnes in 2003. This is most notably for non-inert waste.

4.2.3 This comparison of Agency data regarding 2000/1 compared to date on 2003 from this survey should be treated with caution as the Agency data would appear to show a capacity in 2000/1 more than double the amount of waste received in 2000/1. The apparent reduction could be due to the multiplier of waste received compared to capacity being reduced from 2.44 for the Agency data for 2000/1 to 1.27 for data on 2003 from this survey.

4.2.4 This apparent reduction in capacity while having an increase in the amount of waste received may be due to facilities optimising their processes by operating closer to their maximum capacity in an effort to improve their competitiveness. However, there may be other reasons for this change as the Agency have ascertained the capacity available in 2000/1, is unknown.

4.3 Conclusion

4.3.1 The findings of this study suggest that there is excess capacity in the system to deal with additional waste requiring treatment. However this is a misleading view since the spare capacity identified is marginal, and within such a margin of error as to not be reliable.

4.3.2 New legislative requirements are likely to increase the demand for treatment such that the demand can easily be expected to exceed the capacity in the near future. This is primarily due to the Landfill Directive, which through its application in the UK has reduced the

number of landfills accepting hazardous waste to approximately twelve (a number of these sites are still in the process of resolving issues with regards to their permits). New outlets will therefore have to be sought for the treatment/disposal of hazardous waste. In addition all waste that is accepted by the hazardous landfills must be pre-treated, again increasing the demand waste treatment capacity. In addition to this, at some point, waste going to non-hazardous landfills will also have to be treated prior to its disposal.

4.3.3 The number of wastes classified as hazardous is also due to be increased as the Hazardous Waste Directive is fully implemented in the UK increasing pressure for alternative treatment/disposal facilities. It is unknown at this point whether this will mean that the spare capacity at current facilities will be taken up or that new facilities will have to be constructed to accommodate a wider variety of waste streams.

4.3.4 Treatment capacity is not simply interchangeable between waste streams. Certain wastes will only be amenable to treatment by certain means. There is no room for complacency and bearing in mind the difficulty of obtaining accurate figures, to plan on the basis of these numbers would be fool hardy. To build a firm foundation an annual monitoring survey is needed building on this work and the effective use of site return data. This must then be tied in with forecasts of arisings of specific waste streams and consideration of their likely management routes. From this, indicative future facility requirements can be identified and provision for this built into the forthcoming regional spatial strategy.

APPENDICES

APPENDIX 1

Environment Agency Tables

Table WDN7-9
Waste deposited at biological treatment facilities in 2000/2001 in 000s tonnes
West Midlands

Planning authority / waste type	Inert/C&D	Municipal	Industrial & Commercial	Special	**Total**
Herefordshire	-	-	-	-	**-**
Shropshire	-	-	23	-	**23**
Staffordshire	-	34	4	-	**38**
Warwickshire	-	-	104	-	**104**
West Midlands Metropolitan	-	-	41	-	**41**
Worcestershire	-	-	-	-	**-**
Total	**-**	**34**	**172**	**-**	**206**

Table WDN8-9
Waste deposited at physico-chemical treatment facilities in 2000/2001 in 000s tonnes
West Midlands

Planning authority / waste type	Inert/C&D	Municipal	Industrial & Commercial	Special	**Total**
Herefordshire	-	-	-	-	**-**
Shropshire	48	-	-	-	**48**
Staffordshire	57	13	83	16	**169**
Warwickshire	-	-	5	-	**5**
West Midlands Metropolitan	201	-	155	309	**665**
Worcestershire	-	-	4	10	**14**
					-
Total	**306**	**13**	**247**	**335**	**901**

Table WDN9-8
Waste deposited at open gate treatment facilities and metal recycling sites in 2000/2001 in 000s tonnes West Midlands

Site code(s)	Description	Inert/C&D	Municipal	Industrial & Commercial	Special	**Total**
A15	Materials recycling facility	24	13	82	111	**230**
A16 / A17	Physical treatment	281	-	158	224	**663**
A18	Incineration (storage at)	-	-	-	-	**-**
A19 / A20	Metal recycling site / vehicle dismantler	10	-	1,800	-	**1,810**
A21	Chemical treatment	-	-	1	1	**2**
A22	Composting	-	34	-	-	**34**
A23	Biological treatment	-	-	127	-	**127**
Total		**315**	**47**	**2,168**	**336**	**2,866**

Table WDN11
Waste deposited at metal recycling facilities: waste planning authority by waste type and site type in 2000/2001
in 000s tonnes
WEST MIDLANDS

Waste planning authority	Birmingham	Coventry	Dudley	Sandwell	Solihull	Walsall	Wolverhampton	Stoke-on-Trent	Telford & Wrekin	Herefordshire	Shropshire	Staffordshire	Warwickshire	Worcestershire	Total
Open gate															
Inert/C&D		1					9								**10**
Municipal															**-**
Industrial & commercial	544	74	179	514		153	35	10	11	63	33	43	59	82	**1,800**
Special															**-**
Total	**544**	**75**	**179**	**514**		**153**	**44**	**10**	**11**	**63**	**33**	**43**	**59**	**82**	**1,810**
Restricted user															
Inert/C&D															**-**
Municipal															**-**
Industrial & commercial													3		**3**
Special															**-**
Total	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**	**3**
All metal recycling facilities															
Inert/C&D	-	1	-	-	-	-	9	-	-	-	-	-	-	-	**10**
Municipal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**
Industrial & commercial	544	74	179	514	-	153	35	10	11	63	33	43	62	82	**1,803**
Special	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**-**
Regional total	**544**	**75**	**179**	**514**	**-**	**153**	**44**	**10**	**11**	**63**	**33**	**43**	**62**	**82**	**1,813**

Table WDN16
Throughput of incineration facilities in 000s tonnes
West Midlands

Sub region / waste type	Municipal	Industrial & commercial	Special	**Total**
Herefordshire				**-**
Shropshire		6		**6**
Staffordshire	200	37		**237**
Warwickshire		36		**36**
West Midlands Metropolitan	695	22		**717**
Worcestershire		7		**7**
Total	**895**	**108**	**-**	**1,003**

Table WCN6-8
Capacity at open gate treatment facilities in 2000/2001 in 000s tonnes
West Midlands

Sub-region / site type	Inert	Non-inert	Special	**Total**
Herefordshire	-	-	-	**-**
Shropshire	25	52	-	**77**
Staffordshire	-	2,402	180	**2,582**
Warwickshire	-	331	-	**331**
West Midlands Metropolitan	406	146	1,093	**1,645**
Worcestershire	-	-	28	**28**
Total	**431**	**2,931**	**1,301**	**4,663**

APPENDIX 2

Treatment Category Definitions

APPENDIX 2

Thermal Treatment

The treatment of waste through the application of heat causing the waste to breakdown into less reactive materials.

Biological treatment

Treatment techniques, which are directed towards stimulating microorganisms to grow and use the waste as a food and energy source causesing the waste to breakdown into material with a lower environmental impact.

Physical treatment

The treatment of waste through purely physical processes such as crushing and sorting.

Chemical/Physico-Chemical Treatment

Treatments that use chemicals, which may be in the form of waste chemicals, to alter the chemical composition of wastes either; enabling them to be recycled, or reducing their potential for environmental impact or allowing them to be more easily disposed of. This is often undertaking in combination with a physical process such as filtration.

Metal Recycling Facilities

Facilities that recycle primarily ferrous and/or non-ferrous metals through the physical separation of different materials.