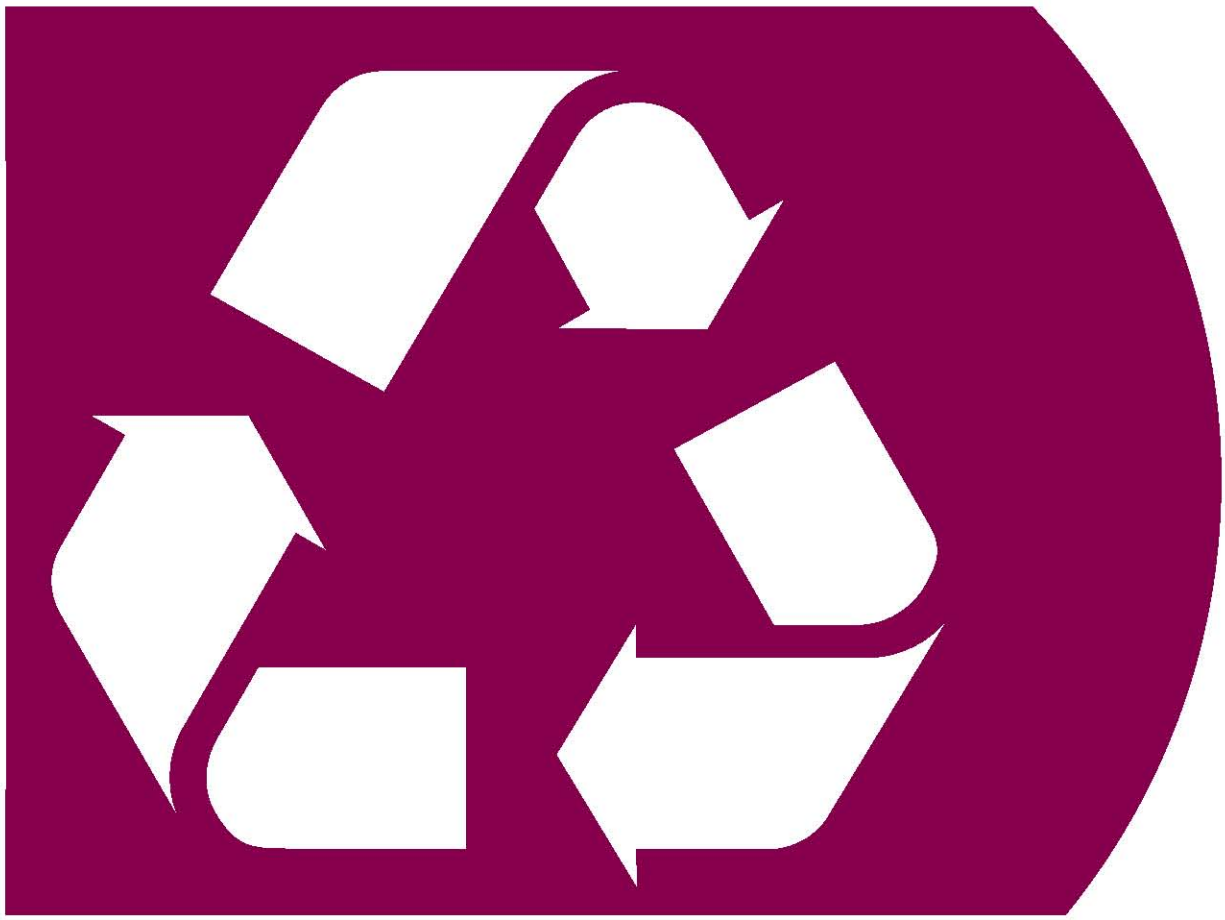

# England's waste infrastructure

Report on facilities covered by environmental permitting

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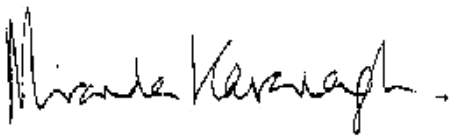

Miranda Kavanagh

**Director of Evidence**

# Executive summary

This report presents the results of work conducted by the Environment Agency at the request of Defra, to help improve understanding of England's waste management infrastructure. It includes a summary of results, along with the full data output in the form of series of data tables that are made available on request alongside the report. All results were produced by collating and re-categorising existing data held within our datasets – no new or external data were collected during the course of this work.

The purpose of this work was to transform our data into a format that will make them useful to waste management decision makers in answering questions about existing waste infrastructure. The information is drawn from systems designed to administer environmental permitting, which means that there are some important limitations associated with its use, which this report describes in detail. But despite the gaps, it represents an important body of information that will assist local and national governments in their waste planning and investment decisions.

The intention is to provide data and information for further analysis and we make no attempt to draw conclusions on the 'state' of the nation's waste infrastructure. The data provided covers all waste management facilities in England issued with an environmental permit on or before 31 March 2010. They do not include sites that are exempt from permitting or that are permitted by authorities other than the Environment Agency.

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# Contents

# 1 Introduction

This report presents the results of a project carried out to support an improved understanding of England's waste management infrastructure, in response to a request by Defra. It provides summarised data on all waste management facilities that are permitted by the Environment Agency. Data were collated from existing EA datasets[1] - no additional data were collected for the purposes of this project.

The Environment Agency holds a substantial amount of information about all waste facilities that require an environmental permit. However, our databases were designed for the purposes of administrating environmental permitting and monitoring operators, rather than for conducting detailed analysis of waste management capabilities. As a result, much of this information has not previously been available to policy makers in a format that would assist them in assessing the state of the nation's waste infrastructure. Environmental permits have historically been grouped into broad categories that relate to permitting and charging regimes, and these categories lack the detail needed to inform planning and investment decision making. In order to address such issues, the major element of the work undertaken by this project was to reclassify waste facilities into a more useful set of categories agreed by a group of partners[2].

The data outputs provide a large amount of information on each waste management facility that is permitted by the Environment Agency, including location, details of activities, and 'permitted throughput'. The latter is the maximum amount of waste that a site is allowed to accept in a given period, according to the conditions set by its environmental permit. It is the closest approximation to capacity that our datasets can provide, but is provided as a 'proxy' only and should not be confused with true capacity. There are various reasons why real, operational capacity is not usually the same as the limit set by environmental permitting, including other constraints on throughput such as conditions within planning consents. In addition, it is not unusual for a facility to apply for a larger permitted threshold than the plant is physically able to process. This complicated picture means that the only way to calculate total capacities accurately would be to ask permit holders for detailed information on their processing capabilities. This would be labour intensive, potentially expensive (there are more than 9000 waste management sites in England) and difficult, not least because many operators regard this information as commercially sensitive.

**The information in the report is drawn from systems designed to administer environmental permitting. We have protected the integrity of the data from permitting systems and avoided amendment or additions from other sources. There are some important limitations associated with the permitting data and its use, which the report describes in detail in sections 2 and 4. Users of the report and data need to be aware of these limitations and recognise that they can lead to different numbers of facilities and different capacity figures to those reported by other organisations.**

[1] With the exception of some data on landfill gas engines, which was sourced from the Non-Fossil Purchasing Agency website

[2] Partners involved at this stage included Defra, CLG, DECC, BIS and WRAP.

This report presents a synopsis of some of the project's main findings. Detailed outputs are made available on request alongside the report on our web-site in the form of data tables. The report explains how the data tables can be used to answer questions on existing waste management facilities and also sets out the important limitations associated with the use of this type of permitting data to study waste infrastructure. The results of this work refer to waste management facilities in England that were permitted on or before 31 March 2010. Permits issued more recently will be included in annual updates. Waste infrastructure in the devolved administrations and infrastructure which is exempt from environmental permitting were beyond the scope of this work.

# 2 Methods

Waste facilities were reassigned from their existing permitting categories into a new system of categories and sub-categories. This new classification system was agreed upon at the outset by a group of partners, and aims to make it easier to use existing data to answer questions about national waste infrastructure. The new categories and sub-categories are as follows.

## 2.1 The categorisation system

| | | |
|---|---|---|
| 1 | Landfill | Hazardous merchant |
| | | Hazardous restricted |
| | | Inert |
| | | Non-hazardous |
| | | Non-hazardous (pulverised full ash, PFA) |
| | | Non-hazardous (stable non-reactive hazardous waste or SNRHW) |
| 2 | Anaerobic digestion (AD) | |
| 3 | Incineration | Animal by-products |
| | | Animal carcasses |
| | | Clinical |
| | | Sewage sludge |
| | | Hazardous |
| | | Municipal |
| | | Co-incineration (hazardous) |
| | | Co-incineration (non-hazardous) |
| 4 | Other energy from waste | Combustion of biogas |
| | | Combustion of biodiesel |
| | | Combustion of refuse derived fuel (RDF) |
| | | Gasification |
| | | Pyrolysis |
| | | Landfill gas engines |
| 5 | Mechanical biological treatment (MBT) | |
| 6 | Composting | Open windrow |
| | | In-vessel |
| | | Combined open windrow and in-vessel |
| 7 | Other biological treatment | Biological treatment of oil refinery wastes |
| | | Sludge treatment |
| | | Effluent treatment |
| | | Tankered effluent treatment (sewage works) |
| | | Leachate treatment |
| | | Other biological treatments |

| | | |
|---|---|---|
| 8 | Hazardous waste treatment | Hazardous and non-hazardous treatment |
| | | Hazardous and non-hazardous treatment including oil |
| | | Hazardous waste treatment |
| | | Hazardous treatment including oil |
| | | Oil treatment |
| | | Distillation of solvents and/or oils |
| 9 | 'Specialist' treatments | Electrical and electronic waste (WEEE) |
| | | Batteries |
| | | Ozone depleting substances (ODSs) |
| | | Clinical waste |
| | | Ship dismantling |
| | | Tyres |
| | | Inert and/or construction waste |
| | | Sewage sludge |
| | | Other non-hazardous waste treatments |
| 10 | End of life vehicles & metal recycling sites | Vehicle dismantling |
| | | Vehicle de-pollution |
| | | End of life vehicle facility |
| | | Metal recycling sites (MRSs) |
| 11 | Material recovery facilities (MRFs) | |
| 12 | Transfer stations | Household waste amenity site |
| | | Household, industrial, commercial (HIC) waste transfer |
| | | HIC waste transfer with treatment |
| | | Clinical waste transfer |
| | | Clinical waste transfer with treatment |
| | | Hazardous waste transfer |
| | | Hazardous waste transfer with treatment |
| | | Inert / non-biodegradable waste transfer |
| | | Inert / non-biodegradable waste transfer with treatment |

The output from this reclassification exercise is a series of Excel data tables, containing large quantities of information about each permitted waste facility, including the category and sub-category to which it belongs. These tables are made available on request alongside this report. Further explanation of the tables and the data they contain are given in Section 3 below. Each entry in the data tables represents an individual permit (rather than an individual site) and each permit is represented only once, in only one category. Some sites have more than one permit associated with the same physical address, and in these cases each individual permit is listed in its appropriate category, meaning multiple entries for the same physical site, but still only a single entry for each permit.

Some sites perform more than one activity under a single permit and in these cases decisions had to be taken over which should be considered the primary activity and therefore which category the permit should belong to. Details of the additional, secondary activities carried out under the permit in question are given in a series of fields in the data tables (see Section 3, below, for more detail). In a small number of cases it was difficult to determine which was the primary activity and in these cases expert judgment was used to categorise the permits concerned. Because the way we permit sites tends to refer to primary activities, in general such decisions were based on what was stated in permit applications, work-plans and other related documents.

There are clearly overlaps and areas of uncertainty between some of the categories used; for example, it can be difficult to distinguish between materials recovery facilities and transfer stations. Furthermore, some of the categories used here are already defined in different ways by different organisations. It was therefore important to ensure that we classified sites consistently and to this end a set of category definitions was developed. The following list briefly describes how we defined each category in this project.

## 2.2 Category definitions

### Landfill

A clearly defined category that is also a pre-existing permitting classification, making these sites easily identifiable within existing datasets.

Before the introduction of the IPPC Directive in 1999 and the Landfill Directive in 2000, all landfill sites were issued with a waste management licence from the Environment Agency and its predecessors. The introduction of these Directives meant that landfill sites had to meet certain legal and environmental criteria to continue operating. Those sites meeting the relevant criteria were re-permitted and those that did not had to close by July 2009. Closed sites are not included in the results of this project.

### Anaerobic digestion

Defined as those sites that treat biodegradable waste via a process in which natural bacteria break it down in an oxygen-free atmosphere, producing biogas and digestate.

The sub-categories listed within this category distinguish between ‘anaerobic digestion’ and ‘anaerobic digestion with combustion of biogas’. This reflects the fact that some sites carry out the digestion process and combustion of biogas under a single permit whereas others have separate permits covering each of these parts of the process. In the latter cases, the permit covering combustion of biogas will be listed under the ‘other energy from waste’ category (see below).

### Incineration

This category contains all incinerators and co-incinerators that require an environmental permit from the Environment Agency and that take waste from off-site sources. In-house facilities are not included.

The distinction between incineration and co-incineration is based on the primary purpose of the plant. The main purpose of incinerators is the disposal of waste. Co-incinerators, on the other hand, burn wastes along with other fuels, with the primary purpose of producing energy or material products. Examples of co-incineration include cement kilns that burn tyres and waste-derived fuels to generate energy that powers the industrial processes at the plant.

The different sub-categories in this category refer to the type of waste burned (clinical, municipal, etc), as stated in the site’s environmental permit.

Our data does not include information on whether incinerators recover energy and heat, although all co-incinerators and municipal waste incinerators recover energy in some form. The Department for Energy and Climate Change(DECC) have provided information from the combined heat and power (CHP) Quality Assurance Programme meaning that we know which plant is recovering heat. DECC information is included at section 5 (ii).

## 'Other' energy from waste

This category contains facilities that burn waste-derived fuels, such as gas (biogas, landfill gas), biodiesel and refuse derived fuel (RDF), to produce energy. Also included are waste-to-energy technologies other than incineration, such as pyrolysis and gasification.

Regulated combustion facilities that do not burn waste or waste-derived fuel (for example., coal-fired power stations) are not included.

Energy generated by landfill gas engines is included in this category. Most landfill gas is used to produce electricity for the National Grid under an agreement with the Non Fossil Purchasing Agency (NFPA). Details of these have been taken from the NFPA website and are included for information (the only data in the detailed results that are not derived from Environment Agency permitting datasets). Details of landfill gas engines without an NFPA agreement are taken from the environmental permits that they must hold.

## Mechanical biological treatment (MBT)

Mechanical biological treatment is a waste process that incorporates two processes. The first is usually the 'mechanical' part of the treatment, which can include, for example, size reduction, size classification and recovery of recyclable wastes which are usually sent off-site for further treatment. The second stage of the process involves biological treatment of any residual biodegradable wastes, by aerobic composting or anaerobic digestion.

There is an obvious overlap between the individual stages of an MBT process and some of the other categories used here (for example materials recovery facilities (MRFs), anaerobic digestion (AD) and composting). Sites were only classified as MBT if the same waste goes through each process in turn. If a site includes sorting and biological treatment but those elements accept different waste streams, then it was not classified as MBT. In these cases the site will have been assigned to the category that reflects its primary activity (MRF, composting, etc), with its other activities listed as secondary processes.

## Composting

Composting sites are those that treat organic, biodegradable waste by decomposing it in the presence of oxygen to produce a soil improver or conditioner. This category is further subdivided into facilities that are 'in-vessel' (treatment is within an enclosed unit), 'open windrow' (treatment takes place outdoors) and 'combined open windrow and in-vessel'.

Note that many composting sites that treat on-site waste are exempt from environmental permitting, and the sites included here will therefore generally only be those that accept waste from off-site sources.

Composting was a previously defined permitting category, and these sites were therefore relatively simple to identify.

## Other biological treatment

This category covers a range of activities, including treatment of sludges, leachate and effluents. Effluent treatment involves separation into a water fraction, which is discharged to the sewer or surface water, and a solid fraction which is sent to landfill or for some form of treatment. Most effluent treatment sites are on-site facilities associated with factories and usually do not take off-site waste. These therefore represent capacity that is restricted to certain waste sources.

Leachate treatment is always associated with either an operational or closed landfill.

The biological treatment category includes a large facility in Teesside that is permitted to take up to eight million tonnes of hazardous and non-hazardous waste per year. This site performs various types of biological treatment and has been assigned to a general 'biological treatment' sub-category. Further work would be necessary to determine specific details of individual biological treatment activities that take place here (such as the capacity available for each).

## Hazardous waste treatment

This category does not refer to a type of treatment, but rather to those sites that are permitted to accept oils and/or solvents or other hazardous wastes. Some accept a combination of these together with non-hazardous waste, and this is reflected in the sub-categories.

A number of other categories may include sites that accept some hazardous waste – for example some types of waste electrical and electronic equipment (WEEE) are classified as hazardous, so WEEE treatment sites will accept some hazardous waste as part of their intake. Similarly, sites classified as vehicle depollution facilities, hazardous transfer stations, clinical treatment facilities, and ozone depleting substances treatment facilities will take a certain amount of waste that is classified as hazardous. The 'hazardous waste treatment' category described here includes only those facilities for which specific treatment of hazardous waste is the primary activity, rather than those which may incidentally take some hazardous waste as part of their intake.

## Specialist treatment

This category covers a wide range of different facilities, including those that treat and recycle WEEE, batteries, tyres and fridges. It is important to note that there will inevitably be a degree of overlap between some of the sub-divisions within this category – for example, fridges are a type of WEEE. The following definitions of the main sub-categories explain how such classification issues were dealt with:

- The **waste electrical and electronic equipment (WEEE)** treatment sub-category covers facilities that treat WEEE for recovery purposes. Treatment activities include sorting, dismantling, shredding, grading, baling, crushing and compacting. Some of these facilities also carry out metal recycling as a secondary activity.

WEEE treatment facilities sometimes also take fridges (which is a separate sub-category – see below), but usually only after these have been de-gassed as they are not generally allowed to handle ozone depleting substances (ODSs). Sites were only assigned to the specific ODS/fridge sub-category if they are specifically permitted to treat fridges and/or the ODSs that they contain.

- The **battery treatment** sub-category contains the main reprocessors of used batteries. It does not include operations that only transfer or collect batteries (these are listed in the transfer category).

- **Ship dismantling** facilities deal with end-of-life ships, recovering materials such as metals and disposing of hazardous components.
- **Clinical waste treatment** facilities are those that treat wastes produced by human and animal healthcare activities, some of which are considered infectious. A small number of these sites burn the treatment residue and in these cases the incineration activity is considered secondary. Operations that only transfer clinical waste are listed under the transfer category and are not included here.
- Facilities in the **ozone-depleting substances (ODS)** sub-category are those that remove ODSs for recovery, usually from waste refrigeration units. Sites were only assigned to this sub-category if they are specifically permitted to treat fridges and/or the ODSs that they contain (rather than treating components of de-gassed fridges as part of a general intake).

Some ODS sites also perform additional associated activities such as metal recycling. Sites that perform both metal recycling and ODS recovery under the same permit were assigned to the ODS sub-category by default, with metal recycling listed as a secondary activity.

- **Tyre treatment** facilities are those that sort, shred, crumb or otherwise treat tyres for recovery purposes. Some end of life vehicle sites (see below) also treat or recover tyres. The sites listed in the tyre treatment sub-category are those for which tyre treatment is the primary activity.
- Most **sewage treatment** facilities treat sewage sludges using physical processes such as dewatering, mixing and thickening. Dried sludge ('cake') is then sent for final recovery, generally either by incineration or land-spreading. The sewage sludge facilities listed in the datasets produced by this project are those that perform a waste activity as defined in the Waste Framework Directive. Others are permitted under the Water Resources Act and are not included here.

- The **non-hazardous waste treatment** sub-category covers those facilities that perform specialist treatment activities that do not fit into any other named sub-categories. These include sorting, crushing, baling, etc of waste plastic and paper, treatment/recovery of packaging waste, glass recycling, wood treatment and recycling, and gypsum and plasterboard recycling. The 'details' field in the data table gives specifics for each site.

- Other specialist treatment sub-categories are **inert/construction waste** treatment, **container recovery** and **reactivation of granulated carbon.**

## End of life vehicles and metal recycling sites

This covers four sub-categories of sites. **End of Life Vehicle (ELV)** facilities have a fixed condition permit with conditions that implement the ELV Directive. **Vehicle dismantlers** and **vehicle depollution** facilities can generally receive whole end of life vehicles and remove hazardous components. **Metal recycling sites** (MRSs) take all manner of scrap metals and may be permitted to process end of life vehicles. These categories reflect present and historical Environment Agency permitting groups. Due to changes in legislation all these facilities have to adhere to the same technical standards when processing end of life vehicles and may be able to issue DVLA certificates of Destruction.

The Environment Agency maintains a separate register of **Authorised Treatment Facilities (ATFs)** in relation to end of life vehicles and is made up of some sites but not all from each of the permitting groups above. Sites on the register can issue DVLA certificates of Destruction. You can access the register at: http://www.environment-agency.gov.uk/business/regulation/65470.aspx

Due to the very large number of sites in this category, it was not possible to scrutinise individual permits. It is therefore possible that a small number of sites listed here would be better placed under other categories that deal with metals (fridge or WEEE treatment for example).

Future data updates will seek to further scrutinise this category and some facilities may be placed in other categories. In the case of end of life vehicles and metal recycling sites we want to change the four categories represented to two new ones, **Vehicle depollution** facilities and **other scrap metal** facilities, to make a clearer distinction between their activities.

## Materials recovery facilities (MRFs)

MRFs are generically defined as those facilities that specialise in sorting and recovering recyclable materials. This very broad definition inevitably covers a range of different activities, which has made it historically very difficult to set boundaries around a definition of what constitutes a MRF. Different organisations often work with different definitions, resulting in differing counts of the number of operational facilities that are classified as MRFs.

For the purposes of this project it was felt that the most useful and simplest solution would be to include in the MRF category only those facilities that sort municipal wastes. Municipal MRFs can accept separated or co-mingled waste (or both) and the dataset includes this information. Activities that recover materials from other types of waste (industrial, construction, etc) have been assigned to the ‘specialist treatment’ category. However, it is extremely difficult to reliably determine which of the specialist treatment facilities could be defined as MRFs. For example, a tyre treatment facility may be sorting good tyre material from mixed waste (which could be defined as material recovery) or it may be simply shredding and baling pre-sorted tyres. Our data do not differentiate between activities at this level of detail. Therefore obtaining a list of commercial and industrial (C&I) MRFs would require further work, following up on the specific activities of relevant sites listed under ‘specialist treatment’.

Furthermore, the list of transfer stations contains so many sites that it was not possible to scrutinise individual permits falling into that category. It is therefore possible that some sites that have been historically permitted as transfer stations (and therefore assigned to that category) would be better defined as MRFs.

## Transfer stations

These facilities deal with sorting and onward transport of wastes for treatment or disposal. This category includes household amenity sites to which the general public (and sometimes commercial businesses) bring waste that cannot be collected by their local authority. A substantial amount of work was done to distinguish these latter sites from other types of transfer station.

Many transfer stations also carry out some incidental activities that could be classified as treatment, such as sorting, compacting, crushing and bulking up of wastes. Permit categories for transfer stations list them as either ‘transfer only’ or ‘transfer with treatment’ and this distinction is represented in the sub-categories defined by this project (see Section 2). However, although ‘transfer only’ sites are largely engaged with transfer, some may still perform certain incidental treatment activities (such as sorting and crushing) without being in breach of their permit conditions, making it extremely difficult to determine which, if any, sites in this category really do only transfer waste. Household waste amenity sites also usually perform similar incidental treatment activities before transferring waste off-site for further treatment or disposal.

# 3 Using the data

The Excel data tables resulting from this data collation exercise are made available on request alongside the report. They contain lists of permits assigned to each of the above categories and sub-categories. Each permit number (rather than each site) is represented only once, in only one category. The tables contain a large number of fields holding detailed information about each permit. The contents of some of these fields are explained in more detail below (these descriptions are also shown in a separate tab on each Excel spreadsheet):

1. **Permit ref** – a unique number assigned to each environmental permit. Each is represented only once (i.e., in only one data table and in only one category)
2. **Other ID** – for internal Environment Agency use – other codes assigned to the permit
3. **PPC Ref** – for internal Environment Agency use – code assigned to permit through PPC
4. **Main category** – the broad permitting category that the site is currently assigned to in Environment Agency databases – i.e., the old permitting classification, not the new system of categorisation developed by this project
5. **WIP category** – the new category to which the site belongs under this project
6. **WIP sub-category** – the new sub-category to which the site belongs under this project
7. **Facility type description** – a series of activity codes referring to current Environment Agency databases (‘A’ codes from the REGIS system)
8. **Environment Agency Region-Area** –in which the site is located; these differ from the old government regions
9. **District** – the lower-tier local authority within whose jurisdiction the site falls; most are waste collection authorities (WCAs) but not waste disposal authorities (WDAs). However a small proportion function as both WCA and WDA
10. **Sub-region** – the upper-tier local authority within whose jurisdiction the site falls; most are unitary or county authorities; most are WDAs but some are groupings of WDAs; most are waste planning authorities (WPAs), with the exception of those that are groupings of WDAs – in these cases the WPA will usually be the authority listed in the ‘district’ field
11. **Planning region** – the (previously recognised) government planning region within which the site falls; included to enable comparison with historic, region-based data
12. **Permitted annual tonnage** – the maximum amount of waste that the site is allowed to process in any one year under the conditions of its environmental permit; however, some permits do not include a maximum throughput, and for these the Environment Agency charge-band has been entered in this field (charge-bands are recognisable because they are entered as ranges (including < and >)); see box below for more detail

13. **D&R codes** – classification of activity under EU Waste Framework Directive recovery and disposal categories[3] (where available – some older permits do not contain this information)
14. **Details** – details of the activities / processes carried out at the site
15. **Multi-waste activity** – a yes/no field indicating whether or not the site performs other type(s) of waste management activity, and whether or not these are under the same, or additional, separate permits. If the secondary activities are under the same permit they will not be listed elsewhere, whereas if they are covered by separate permits those other permits will be listed in the relevant category(categories); see box below for more details
16. **Multi-waste activity details** – details of any other activities carried out at the site, under the same or additional permit number(s)
17. **Associated permits** – additional permits associated with the same site
18. **Other datasets** – if the site is a multi-activity site, this field indicates which (if any) other data tables it appears in. This field will only contain an entry if the additional activities are under separate permits – if they are carried out under a single permit the site will appear in only the category that relates to its primary activity (because each permit is listed only once)
19. **Production of fuel** – whether or not the site's activities/processes produce any form of fuel (this field could not always be populated due to insufficient data).

### Further details on the 'permitted throughput' field

In most cases, the figure in this field is the maximum amount of waste a site is allowed to accept in one year according to the conditions of its permit. However, if either (a) a site does not have a permitted throughput specified in its permit, (b) the permit is a standard rules permit, or (c) a category was too large to allow all permits to be individually scrutinised (for example, the end of life vehicles (ELVs) and metal recycling sites (MRSs) list which contains more than 2000 sites), then the site's charge-band was entered into this field instead. 'Charge-bands' refers to sites' size categories (for fees and charging purposes) and can be recognised in this field because they are entered as ranges (for example., 25,000-75,000; <5,000, >75,000, etc.). In these cases the upper limit of the charge-band should be seen as the nearest available equivalent to permitted throughput. When adding permitted throughputs to obtain a total maximum limit for a category of site, the upper limits of any charge-bands should be used.

[3] A list of R and D codes can be found at Annex 2, reproduced from the 2008 Waste Framework Directive (http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:312:0003:0030:EN:pdf)

**Further details on the 'multi-waste activity' field**

There are four possible entries in this field:

- 'no': only the specified activity takes place at this site
- 'yes – same permit': other types of waste management activity take place at this site and under this permit; these activities will not be separately listed under their corresponding categories as they are not covered by separate permits
- 'yes – different permit': other types of activity take place at this site but under different permits; these other permits are listed under the relevant category, hence these additional activities are accounted for in the wider dataset
- 'yes – same and different permits': additional types of activity take place, some under this permit, others under separate permits (adjacent fields provide details on which); only those covered by separate permits will be listed in their corresponding categories

Other fields provide details of what the multi-activities are and (where relevant) the permit numbers of separately permitted activities and the categories in which they are listed.

Although every effort was made to include details of all secondary activities, it was not possible to scrutinise details of all permits in the two very large categories (ELVs / MRSs and transfer stations) and some of the secondary activities performed at these sites may have been overlooked in the results.

Using the Excel datasets, it is possible to perform various analyses and to produce data summaries on user-defined sections of England's waste management infrastructure. For example, it is possible to obtain counts of sites in individual categories or sub-categories, counts of sites in individual areas of the country (for example, those covered by new Local Enterprise Partnerships), and total permitted throughputs for different types of facilities. However, as previously mentioned, the fact that these data are drawn from databases designed for other purposes means that there are some important caveats that must be taken into account before attempting to draw conclusions. The following section outlines the most important of these caveats and limitations.

# 4 Caveats associated with data use

The data presented in the tables were drawn from systems that are designed to administer charging and to monitor regulated waste management operations. As a result there are certain limitations associated with their use in assessing the 'state' of waste infrastructure. The most important of these limitations are as follows:

## Only permits issued on or before 31 March 2010 are included

Permits issued more recently will be included in future data updates.

## The datasets only include sites permitted by the Environment Agency under environmental permitting, and these make up only a part of the waste management estate

Some waste management sites and activities are missing from the datasets produced by this project because they are not included in the Environment Agency's permitting databases. These include any activities that are exempt from permitting because they are small scale and/or low-risk (for example, certain recycling activities, landspreading, ), those below certain size thresholds that are permitted by local authorities and those that are regulated under other regulatory regimes.

Although it is likely that the estate permitted by the Environment Agency makes up a large proportion of England's waste management capacity, this may not be true for some specific types of waste, particularly those that are often spread straight onto land under exemptions (such as manures and slurries). A complete picture of total waste management capabilities can only be arrived at by adding all other waste management sites to those whose data are captured by this project. More detail on the types of sites and activities that are not permitted by the Environment Agency can be found in Annex 1.

A small number of other types of facility were also excluded. These are:

- closed landfills
- in-house storage facilities
- pet cemeteries and crematoria (which account for very small volumes of waste)
- deposit in landfill as a recovery operation (20 permits, mainly inert waste and often associated with major developments such as the Olympics site)
- reprocessors (e.g., paper mills that take some recovered waste paper), which are permitted as installations rather than waste management sites
- mobile plant (325 permits, transient in nature and therefore difficult to determine current operational capacity)
- previously exempt activities that are moving across into the permitting regime (as this transferral process is taking place over time, beginning in April 2010)

Permitted waste management facilities will normally be operational. In some cases they may not be operational, for example they may be 'mothballed' or may be yet to start operating.

## Permitted throughput is not the same thing as operational capacity

The operational capacities of waste management facilities are not recorded within environmental permitting datasets. The closest approximation to capacity that Environment Agency data can provide is the maximum amount of waste a site's permit allows it to process ('permitted throughput') or, where this is not specified, the upper limit of the 'charge-band' within which the permit falls (see Section 3 for a fuller explanation of these terms).

Permitted throughput (or in some cases the upper limit of the charge-band) represents the maximum amount of waste that a site can process before it will be in breach of its environmental permit. Although this can be seen as a type of capacity threshold, there are several reasons why the true operational capacity may be significantly different to (usually lower than) this number. For example, there may be other restrictions that place more stringent limits on capacity, such as conditions associated with planning consent. It is also possible for an operator to apply for a higher limit in the environmental permit than the plant is actually physically able to process (perhaps with a view to adding new infrastructure and extending their operational capacity should this become economically viable).

Although physical capacity will normally be lower than permitted throughput, it is also theoretically possible that some sites were built to handle a higher volume of waste than their permit allows, which means that in some cases the reverse may be true – that is, true capacity could be higher than permitted throughput. In such cases, permitted throughput could theoretically be increased by applying to modify permits, without the need to build new infrastructure.

Since estimates of total capacity calculated using permitted throughput data will usually be maxima (and therefore probably over-estimates), any such calculations that suggest over-capacity should be treated with extreme caution, because they will only show that the maximum allowed under environmental permitting is more than enough to meet demand. The actual, practical capacity may in fact be significantly lower and may therefore be less than enough.

## Some sites perform more than one treatment activity under the same environmental permit

Some waste management sites perform more than one treatment activity. In some cases each activity has its own permit, in which case each individual activity will be included in the relevant category. But sometimes a single permit allows multiple activities, and in these cases the site will be listed only in the category that represents its primary activity (that is each individual permit appears only once). Secondary activities for these sites are shown under the 'multi-activity' fields of the data table in which they appear.

There are two principal issues associated with sites that perform multiple activities under a single permit:

- Their permitted throughput is usually the maximum quantity of waste that can enter the site, and is not sub-divided into the throughput allowed for individual activities. In many cases the operator of the site is free to allocate the site's capacity to the different activities. Various factors (principally market forces) will then dictate how much waste is treated by each process, and this will vary over time for an individual site, making it extremely difficult to estimate capacities for individual activities.
- A simple count of the number of sites assigned to a particular category may not give an accurate figure of the total number of sites performing the activity in question. It will also be necessary to look under the 'multi-activities' of sites in other categories to make sure none also perform that activity under other types of permit.

To illustrate the last point above, counting the number of sites listed in the 'composting' category gives a total of 203 facilities. But three sites listed under 'other categories' also carry out some composting as a secondary activity. As these latter composting activities are not covered by separate permits, and are not the sites' primary activity, they do not appear in the composting category. The true total number of sites that carry out composting activities can only be arrived at by adding the number in that category to the number in other categories that perform composting under other types of permit – i.e., 203 + 3.

## Some types of facility can be difficult to classify and there are ‘grey areas’ between certain categories

Some types of facility can be difficult to define, particularly where overlaps exist in terms of the type of activities they perform. For example, it can be difficult to distinguish between MRFs and some types of transfer station, because both sort waste and transfer it off-site for processing. The way such classification ‘grey areas’ are dealt with sometimes varies between organisations, which affects their overall counts of the numbers of such sites. Section 2 (above) provides descriptions of how each category was defined for the purposes of this project. It is important to note that these definitions may differ from those currently used by some other organisations.

Similarly, Environment  Agency data do not contain sufficient detail to enable reliable identification of C&I MRFs, because it is often not clear whether a specialist treatment site is sorting waste and recovering the material or treating a pre-sorted waste stream. The MRF category therefore only contains municipal MRFs. See Section 2.2 (xi) (above) for more detail.

Since standard permitting categories differ from the system of categorisation used by this project, sites had to be re-classified into the new categories. A set of decision-making criteria was used to ensure this was done consistently, according to the category definitions described in Section 2 (above). In the case of sites that perform more than one activity under a single permit, decisions had to be made over which activity should be considered the primary one, and therefore which category the permit should be assigned to. Again, consistent criteria were used to make these decisions, but there was a small number of cases where there was no clear primary activity. Most of these cases were assigned to the category closest to their existing permitting category (on the basis that permitting usually refers to the main activity taking place at a site) but there will inevitably have been an element of subjectivity in classifying these sites.

Although every attempt was made to ensure consistency in the way sites were classified, the overlaps between different categories mean that there may still be sites that some would argue should be classified differently . We consider that these will be small in number.

# 5 Results – data summaries

Below are some data summaries for a selection of facility types. These are provided as examples of the types of analyses that can be performed using the Excel datasets produced by this project. We have rounded some of the permitted throughput figures in these tables and users are advised to use the Excel data tables themselves if they need to undertake an authoritative analysis.

## 5.1 Anaerobic Digestion (AD)

| SUMMARY | |
|---|---|
| Total no. of sites (permitted) | 30 |
| Permitted throughput range of sites (tonnes per annum) | 5,000 – 1,752,000[4]<br>[2 sites have unspecified max throughput] |
| Total permitted throughput (upper limits) (tonnes per annum) | **- all**: 6,078,600[5] plus 2 sites with no specified max<br><br>**- excluding sewage treatment sites & sites specifically treating effluent from food & drinks factories: 552,000** |
| No. of other sites with AD as an additional, secondary activity | 0 |

On 31 March 2010 there were 30 AD plants permitted by the Environment Agency in England. There was no specific exemption for AD sites under the old exemptions rules (pre-April 2010) so most AD capacity will be included. The exception is AD facilities associated with sewage treatment where the digestate they produce goes straight to agricultural land, as these are not permitted under the Environmental Permitting Regime.

A rule change in April 2010 means that small facilities (those able to treat <50m3 of waste at any one time or <1,250m3 at premises used for agriculture) are now exempted from permitting and therefore any that became operational since April will be excluded from future data updates. See Annex 1 for a list of old exemptions and new registrations.

The total permitted throughput for AD is just over six million tonnes per annum. However, most of the AD sites with >100ktpa permitted throughputs are sewage treatment plants or facilities

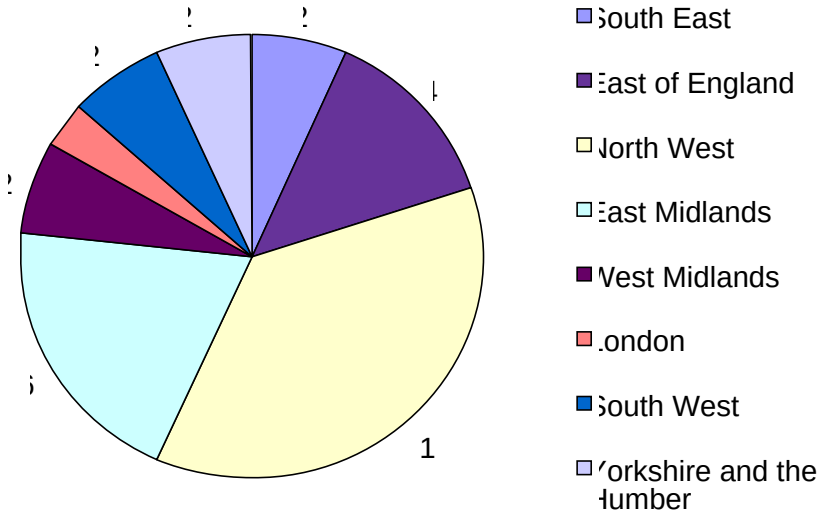
[4] this figure relates to digestion of brewery effluent at one site in North Yorkshire – this figure is in $m^3$. Most of the AD sites with large (>100,000 tpa) permitted throughputs are waste water / sewage treatment plants or those treating effluent from food or drinks factories.

[5] or 7,830,600 if the above site for digestion of brewery effluent is included.

digesting effluent from food and drinks manufacturing plants. Excluding these reduces the total permitted throughput for AD facilities in England to 552,000 tpa.

Figure 1, below, shows how the 30 AD sites are distributed among the (previously recognised) Government planning regions. Using the data provided, such analyses could be done at any geographic scale – for example by upper tier local authority or by Local Enterprise Partnership areas.

**Figure 1**: Number of AD sites (on 31 March 2010) located in each of the previously recognised Government planning regions




## 5.2 Incineration and co-incineration

| SUMMARY | |
|---|---|
| Total no. of sites (permitted) | 73 |
| Permitted throughput range of sites (tonnes per annum) | 312 – 675,000<br>[1 incinerator has no specified max throughput] |
| Total permitted throughput (upper limits) (tonnes per annum) | 8,300,000 plus 1 site with no specified max |
| No. of other sites with incineration as an additional, secondary activity | 3 |

73 incinerators and co-incinerators are permitted by the Environment Agency as waste installations. These include 20 clinical waste incinerators, seven hazardous waste incinerators, nine sewage sludge incinerators, seven animal by-products/carcass incinerators, 18 municipal waste incinerators, and 12 co-incinerators (seven of which take hazardous waste) (see Figure 2). Co-incinerators are industrial or power plants that burn waste as a substitute fuel, but not for the primary purpose of waste disposal; for example, cement kilns burning waste to provide power for the process.

The maximum annual tonnage that these incinerators are permitted to accept ranges from 312 (a clinical waste incinerator operated by the Health Protection Agency) to 675,000 (a municipal waste incinerator in London), but one site has no specified upper limit. The total maximum permitted throughput for all incinerators is 8,300,397 tpa, plus the one site for which an upper limit is not specified.

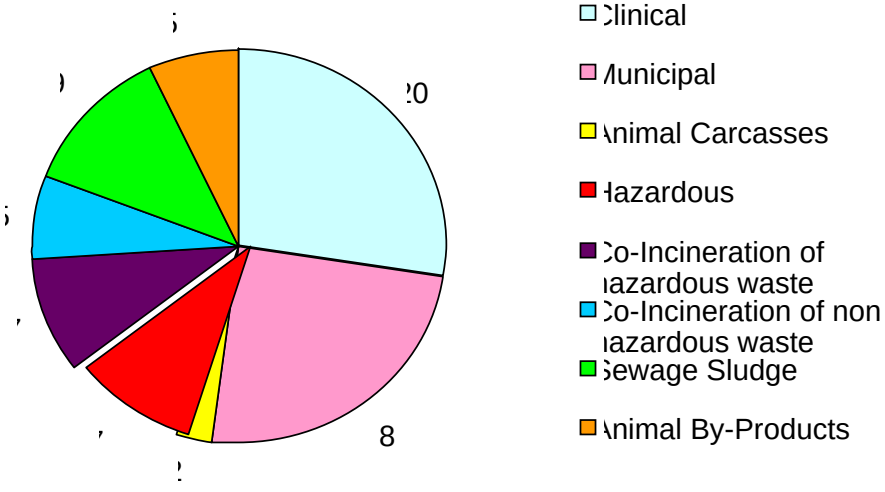
The 18 municipal waste incinerators have maximum permitted throughputs ranging from 3,500 to 675,000 tpa, and totalling 4,521,600 tpa. For the seven hazardous waste incinerators this figure is 178,000 tpa, plus one site with no specified upper limit. The total permitted throughput for co-incinerators is 1,698,000 tpa.

Three sites perform some kind of incineration as a secondary activity under permits listed in other categories. One of these sites carries out co-incineration as a secondary activity under a landfill permit (with no specified maximum permitted throughput); one co-incinerates solvents under a hazardous waste treatment permit (with a maximum permitted throughput for the entire permit of 31,250 tpa); and the third is a clinical waste treatment facility that carries out some incineration. The permitted throughput on the latter permit is subdivided by activity and the incineration element has a specific throughput limit of 8,355 tpa.

The data used in this study does not include information on whether incinerators recover energy and heat, although all co-incinerators and municipal waste incinerators recover energy in some form. Information from the combined heat and power (CHP) Quality Assurance Programme means that we know which plant are recovering heat. They are:

- Sheffield. 225,000 tonnes per year(tpy) waste capacity, 17MWe[6] and 39MWth[7] outputs.
- Nottingham. 160,000 tpy, 14.4MWe and 44.2MWth output (Maxheat).
- Slough Heat & Power. 110,000 tpy, 104MWe and 22MWth output (Maxheat).

Coventry. 250,000tpy, 18MWe and 7.5MWth (Maxheat).
Figure 2: Numbers of incinerators and co-incinerators by sub-category




[6] Megawatt electrical.
[7] Megawatt thermal.

## 5.3 Other combustion and EfW

| SUMMARY | |
|---|---|
| Total no. of sites (permitted):<br>burning biodiesel<br>burning biogas<br>gasification facilities<br>pyrolysis plants<br>RDF combustion<br>Landfill gas engines | <br>1<br>32<br>2<br>1<br>1<br>265* |
| No. of other sites with combustion/EfW as an additional, secondary activity | 34 (all landfill gas engines) |

*Includes those not permitted by the Environment Agency (covered by NFFO agreements)

32 sites are permitted to burn biogas and one to burn biodiesel. The latter powers five combined heat and power (CHP) engines and the electricity generated is used to power the surrounding plant. All but two of the biogas burners are associated with sewage sludge treatment sites. All have boilers and engines that produce electricity to power the plant and/or for export to the National Grid. None of these combustion sites has a specified upper throughput limit.

One site is permitted to burn RDF. This produces fuel pellets from sewage sludge and burns them to generate electricity. There is no specified maximum permitted throughput for this site.

There are two gasification facilities, and these have a combined maximum throughput of 99,000 tpa. Both produce electricity. One is located in the East Midlands, the other in the West Midlands.

There is one permitted pyrolysis plant (in Cambridgeshire), which has a maximum permitted throughput of 49,000 tpa. This site produces electricity.

In addition to the 265 separately permitted landfill gas engines, 34 sites listed under the landfill category also operate engines as secondary activities, giving a total of 299.

## 5.4 MBT

| SUMMARY | |
|---|---|
| Total no. of sites (permitted) | 19 |
| Permitted throughput range of sites (tonnes per annum) | 50,000 – 305,000 |
| Total permitted throughput (upper limits) (tonnes per annum) | 2,728,300 |
| No. of other sites with MBT as an additional, secondary activity | 0 |

There are 19 MBT plants permitted by the Environment Agency in England. The permitted throughput of these sites ranges from 50,000 to 305,000 tpa and totals 2,728,300 tpa.

Some MBT plants also produce a waste fuel (such as RDF), but permitting data do not contain sufficient detail to determine which do and which do not.

## 5.5 'Specialist' treatments

| SUMMARY | |
|---|---|
| Total no. of sites (permitted):<br>inert and/or construction waste treatment<br>WEEE treatment<br>tyre treatment<br>clinical waste treatment<br>fridge / Ozone depleting substances treatment<br>battery treatment<br>ship dismantling<br>other non-hazardous waste treatment | <br>116<br>81<br>51<br>15<br><br>8<br>5<br>9<br>86 |
| Total permitted throughput (upper limits)<br>(tonnes per annum):<br><br>inert and/or construction waste treatment | <br><br><br>9,500,000<br>[4 sites have unknown max throughput] |
| WEEE treatment | 2,426,000<br>[1 site has unknown max throughput]] |
| tyre treatment<br><br>clinical waste treatment<br>fridge treatment<br>battery treatment<br>ship dismantling<br><br>other non-hazardous waste treatment | 2,018,000<br>[1 site has unknown max throughput]<br>205,000<br>829,000<br>Most have no specified max throughput<br>842,000<br>[1 site has unknown max throughput]<br>5,800,00<br>[4 sites have unknown max throughput] |
| No. of other sites with specialist treatment as an additional, secondary activity:<br>inert and/or construction waste treatment<br>WEEE treatment<br>tyre treatment<br>clinical waste treatment<br>fridge treatment<br>battery treatment<br>ship dismantling<br>other non-hazardous waste treatment | <br><br>0<br>4<br>2<br>0<br>0<br>0<br>0<br>7 |

'Specialist treatment' sites are those that specialise in treating particular types of waste, such as tyres, inert/construction waste, WEEE, fridges, clinical waste, batteries or ships. This category also includes a general sub-category which captures all other non-hazardous waste treatment that is not covered elsewhere.

## Inert and/or construction waste treatment

116 sites are permitted as inert and/or construction waste treatment facilities. These perform activities such as sorting, screening and crushing. They have a total maximum permitted throughput of 9,500,000 tpa plus four sites that do not have a specified throughput limit.

## WEEE treatment

81 WEEE treatment sites are permitted by the Environment Agency. These have a total maximum throughput of 2,426,000 tpa (plus one site without a permitted maximum). Treatment consists of activities such as sorting, dismantling, shredding, screening, grading, baling, compacting, crushing and granulation. Since some types of WEEE are classified as hazardous, most of these sites handle a certain amount of hazardous waste. Some (48) are specifically excluded from handling ozone depleting substances.

Four additional sites carry out WEEE treatment as a secondary activity under other types of permits. These have a total permitted throughout (for the entire sites) of 680,898 tpa, and are likely to represent some additional WEEE treatment capacity.

## Tyre treatment

51 sites are permitted to treat tyres. These perform a range of activities to dispose of or recover waste tyres, including sorting, shredding and crumbing. The total maximum permitted throughput of these sites is 2,018,000 tpa (plus one site that does not have a specified throughput limit). In addition, two sites perform some tyre treatment as a secondary activity under WEEE treatment permits. One of these has a maximum throughput (for the whole site) of 25,000 tpa; the permitted throughput of the other is not specified.

## Clinical waste treatment

15 sites are permitted to treat clinical waste, which usually involves some form of disinfection via heat treatment (such as autoclaving). These have a total combined maximum throughput of 205,000 tpa.

## Ships, batteries and fridges

There are nine facilities permitted to dismantle ships, with a combined permitted throughput of 842,000 tpa (plus one site that does not have a specified throughput limit).

Five sites are permitted to treat waste batteries. Most of these recover heavy metals from batteries and other feedstock (such as fluorescent bulbs and dental amalgam). Three of the five battery treatment permits do not specify a throughput limit.

Eight sites treat fridges or ozone depleting substances (ODS) and these have a total permitted throughput of 829,448 tpa.

### Other non-hazardous waste treatment

This is a general sub-category which captures all activities not included elsewhere. These include container recovery; crushing cans; granulating rubber and plastic for recovery; sorting and de-contaminating glass; chipping wood; baling cardboard for recovery; treating ash to make fertiliser; treating/separating non-hazardous liquids; and converting waste plaster board into gypsum. 86 permits have been issued for such activities, with a total combined maximum throughput of 5,822,000 tpa (plus four sites that do not have a specified throughput limit). Seven additional sites carry out some form of non-hazardous waste treatment activities under other permits. These have a total permitted throughput of 3,882,000, however one of these is a large landfill that does some ash treatment as a secondary activity. The permitted throughput is for the entire site, so it is unlikely that this represents the actual additional capacity within these other permits for non-hazardous waste treatment.

## 5.6 End of life vehicles and metal recycling sites

| SUMMARY | |
|---|---|
| Total no. of sites (permitted):<br>End of life vehicles (ELV)<br>Vehicle dismantling<br>Vehicle de-pollution<br>Metal recycling | <br>749<br>761<br>60<br>771 |
| Total permitted throughput (upper limits) (tonnes per annum):<br>ELV<br><br>Vehicle dismantling<br><br>Vehicle de-pollution<br>Metal recycling | <br><br>2,342,500<br>[1 site has unknown max throughput]]<br>6,197,500<br>[8 sites have unknown max throughput]]<br>265,000<br>135 sites have no specified max |
| No. of other sites with ELV/MRS as an additional, secondary activity | 2 |

There are 1,570 sites permitted to treat, depollute or dismantle end of life vehicles. The differences between the three types of vehicle treatment permits are explained in Section 2 above. Taken together, these facilities have a total maximum permitted throughput of 8,812,500 tpa (plus nine sites without a specified limit). In addition, two sites permitted as WEEE treatment facilities also act as ELV facilities under the same permits. These additional two have a total permitted throughput (for all activities combined) of 89,000 tpa.

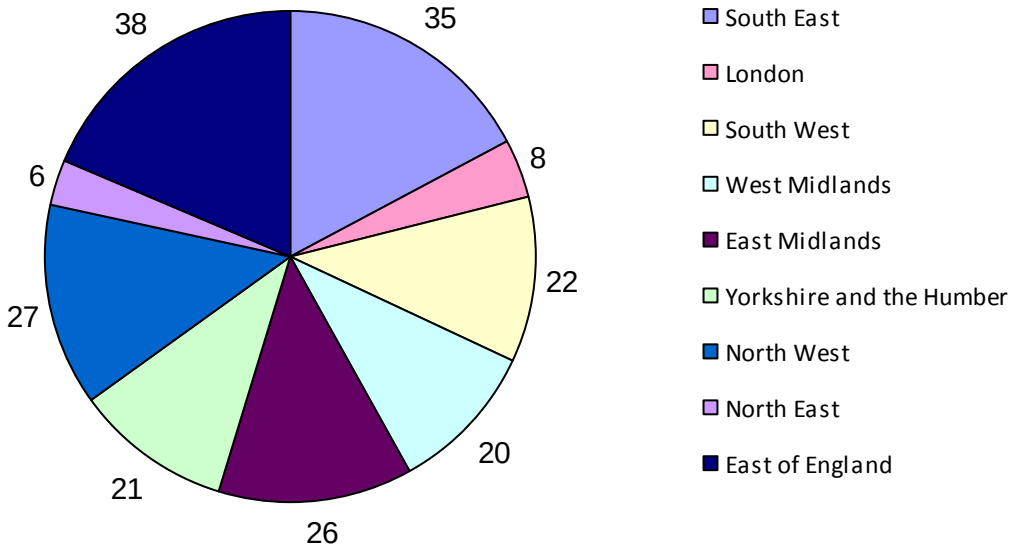
771 permits have been issued to metal recycling sites. A large number (135) of these do not have a specified upper throughput limit, so it is not possible to accurately calculate total permitted throughput for this sub-category.

## 5.7 Composting

| SUMMARY | |
|---|---|
| Total no. of sites (permitted):<br>Open windrow<br>In-vessel<br>Combined open windrow and in-vessel | <br>149<br>41<br>13 |
| Total permitted throughput (upper limits) (tonnes per annum):<br>Open windrow<br>In-vessel<br>Combined open windrow and in-vessel | <br><br>6,138,000<br>1,778,000<br>872,000 |
| No. of other sites with composting as an additional, secondary activity | 3 |

There are 203 composting sites (Figure 3), the majority of which (73 per cent ) are open-windrow. The total maximum permitted throughput for all composting facilities is 8,714,000 tpa. In addition, three facilities carry out composting under other types of permits (two MRFs and an MBT plant). Two of these have maximum throughput limits of 50,000 and 45,000 tpa (for the entire sites), but the third does not have a specified throughput limit so it is difficult to make any judgment of how much extra composting capacity is represent by secondary activities.

Figure 3: Numbers of composting sites in each of the previously recognised Government planning regions



## 5.8 Hazardous waste treatment

| SUMMARY | |
|---|---|
| Total no. of sites (permitted):<br>Hazardous waste treatment<br>Hazardous waste treatment including oil<br>Hazardous and non-hazardous waste treatment<br>Hazardous and non-hazardous waste treatment including oil<br>Oil treatment<br>Distillation of solvents and/or oils | 36<br>30<br><br>25<br><br>19<br>76<br>17 |
| Total permitted throughput (upper limits) (tonnes per annum):<br>Hazardous waste treatment<br><br>Hazardous waste treatment including oil<br>Hazardous and non-hazardous waste treatment<br><br>Hazardous and non-hazardous waste treatment including oil<br>Oil treatment<br><br>Distillation of solvents and/or oils | <br><br>2,275,000<br>[3 sites have no specified limit]<br>2,807,000<br>2,106,000<br>[1 site has no specified limit]<br><br><br>2,436,000<br>4,322,000<br>[2 sites have no specified limit]<br>Most have no specified max throughput |
| No. of other sites with hazardous waste treatment as an additional, secondary activity | 1 |

There are 203 sites permitted as hazardous waste and/or oil treatment facilities. Excluding distillation facilities (most of which do not have a permitted throughput threshold), these sites have a combined maximum permitted throughput of nearly 14,000,000 tpa, although a number of sites do not specify a maximum.

One additional site specifically performs some hazardous waste treatment as a secondary activity under a different type of permit (an ELV permit). However, it is also important to note that several other categories of facility will handle certain forms of hazardous waste as components of their intake. All vehicle depollution facilities, for example, will handle oil and other hazardous components of end of life vehicles. Some forms of WEEE are classified as hazardous, as are many types of clinical waste. Hazardous waste treatment is not listed as a secondary activity for such sites because any such treatment is not a separate activity but an inherent part of the principal waste treatment process.

## 5.9 Landfill

| SUMMARY | |
|---|---|
| Total no. of sites (permitted):<br>Inert<br>Non-hazardous<br>Non-hazardous (Pulverised Fuel Ash)<br>Non-hazardous (Stable Non-reactive Hazardous Waste)<br>Hazardous merchant<br>Hazardous restricted | <br>179<br>183<br>13<br><br>49<br>17<br>6 |
| Total permitted input (upper limits)<br>(tonnes per annum):<br>Inert<br><br>Non-hazardous<br><br>Non-hazardous (Pulverised Fuel Ash)<br>Non-hazardous (Stable Non-reactive Hazardous Waste)<br>Hazardous merchant<br>Hazardous restricted | <br><br>32,324,000<br>[9 sites with no specified limit]<br>64,272,000<br>[6 sites with no specified limit]<br>7,980,000<br><br>29,334,000<br>3,068,000<br>212,000 |
| No. of other sites with landfill as an additional activity | 0 |

There are 447 permitted landfills, excluding any that have closed or are operating under an appeal. The intake of six of these is restricted to particular waste sources. The total maximum permitted input of all landfill sites together is 137,150,043 tpa, of which 212,000 tpa is restricted (see Figure 5). However, there are a further 15 landfills with no specified input limit.

Figure 4: Numbers of operational landfill sites in each of the previously recognised Government planning regions

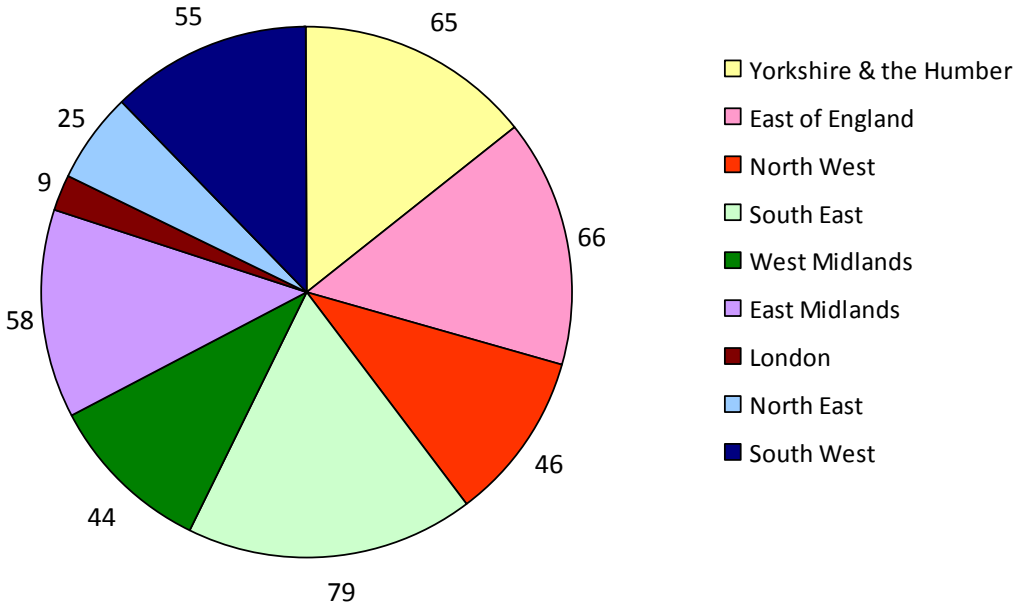
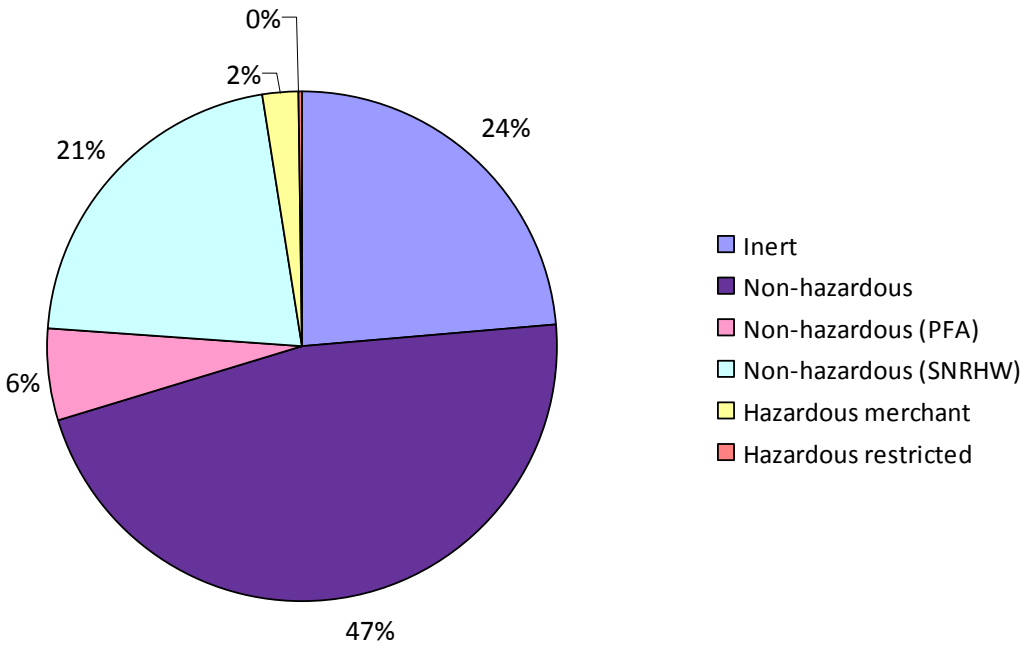



Figure 5: Proportion of total permitted throughput for landfill that is assigned to each sub-category



## 5.10 MAPS

Each dataset has been mapped. The large number of sites in many categories made national maps unreadable, and we have therefore produced a separate map for each category for each of the previously recognised government regions. There are 117 maps in total. The maps can be downloaded from our website.

The Excel data tables include a grid reference for each site so any user will be able to produce their own maps using the specifications, scale, combinations of sites, and so on,that best suit their needs. It would, for example, be quite feasible to divide sites into areas covered by local authority or Local Enterprise Partnership. Two examples of the maps we have produced are shown below (composting in London and landfill in the North West):

Figure 6: Permitted composting facilities in the (previously recognised) London Planning Region

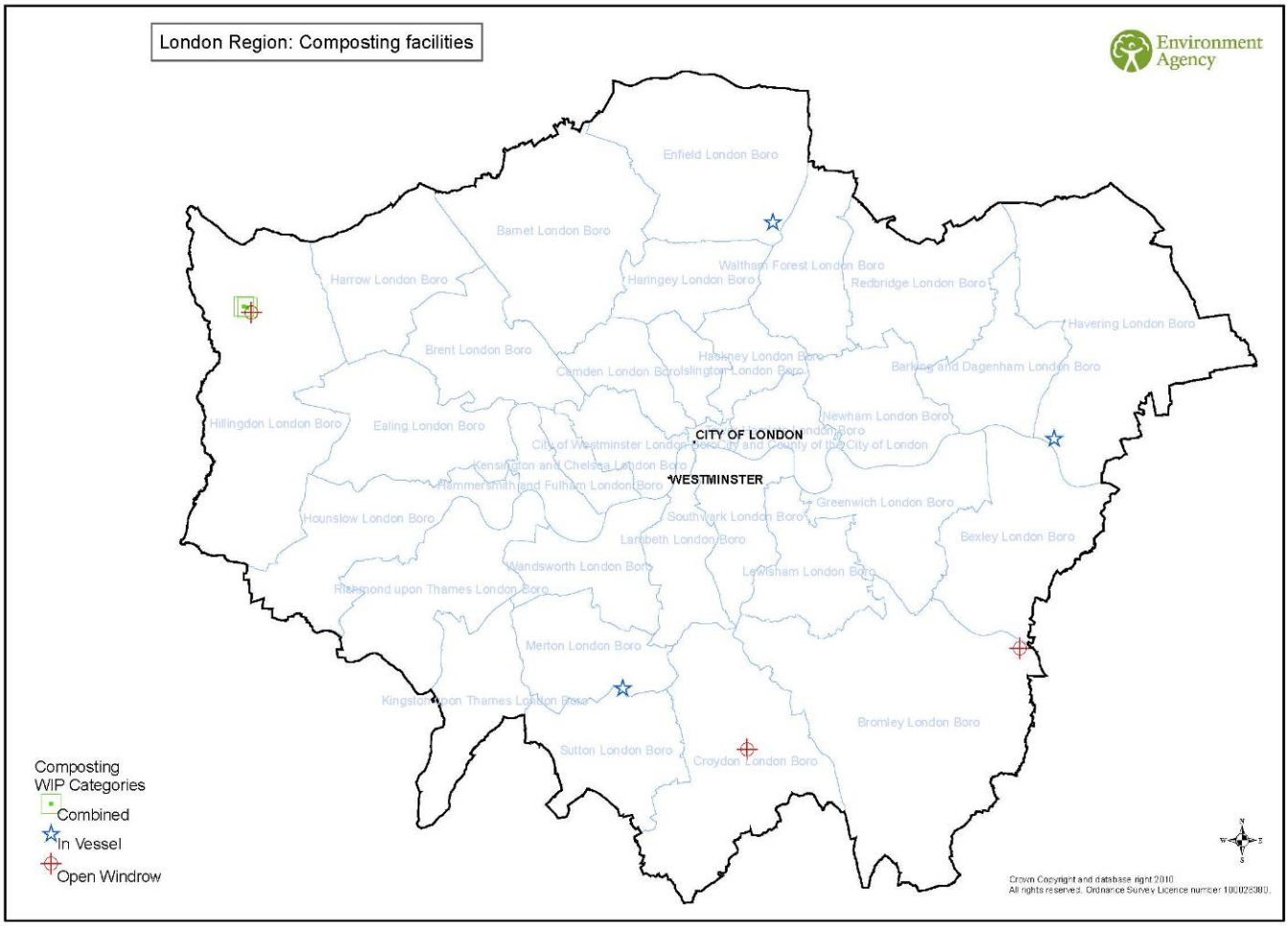
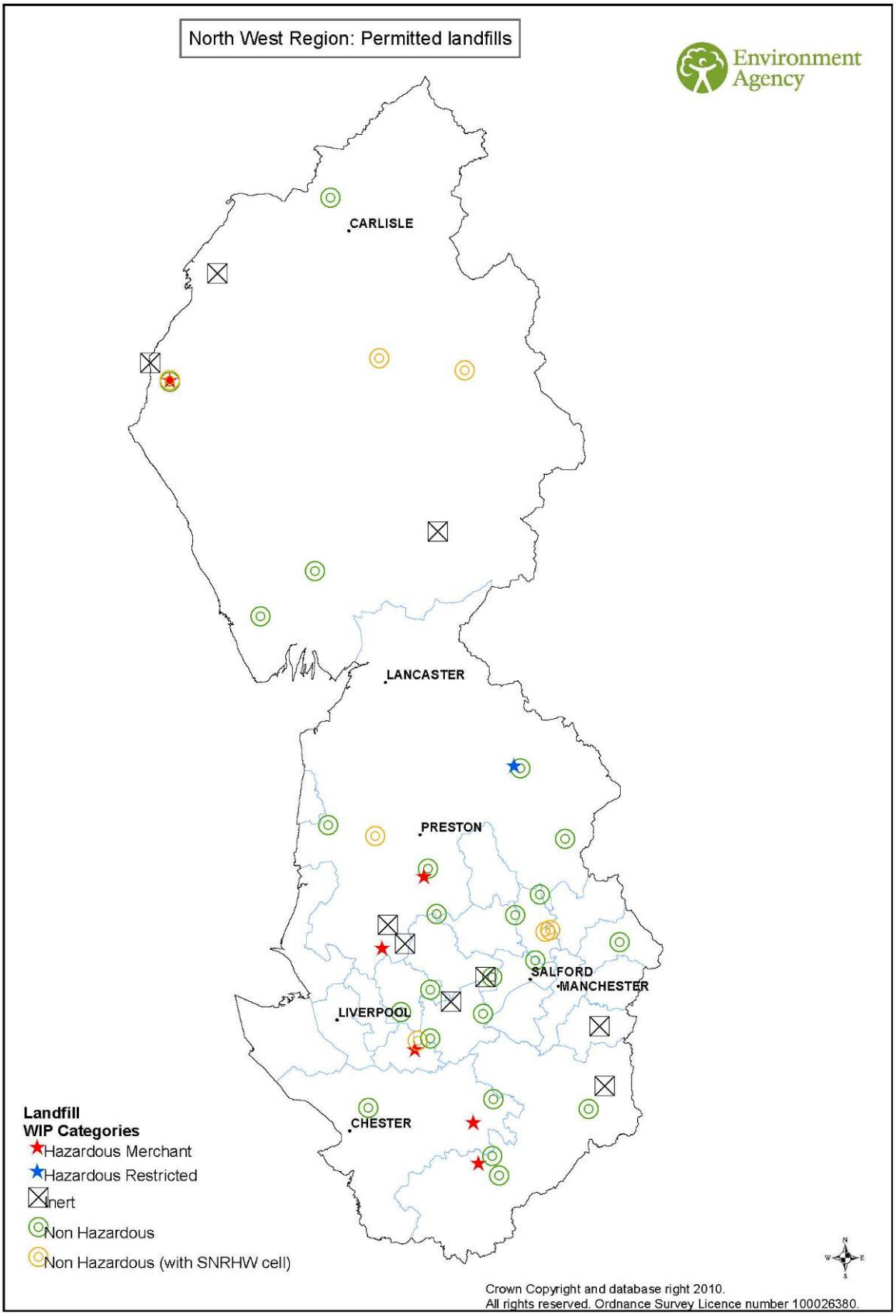


Figure 7: Permitted landfill sites in the (previously recognised) North West Planning Region



# 6 Conclusions

This report and associated data tables collate a large volume of data in a format that will make it useful to waste management decision makers. Users of the outputs will be able to manipulate the data to answer a wide range of questions about England's waste infrastructure.

The results of this project should assist national and local government in planning waste infrastructure developments.

It is important to recognise the gaps and limitations of the data when interpreting the maps and data tables made available on request alongside this covering report.

# 7 ANNEX 1 - Waste management activities that are not regulated by the EA under environmental permits

The Environment Agency administers permits to all waste operations except (a) those that are Part A(2) or B under Schedule 1 of EPR2010 and (b) those that are exempt (now referred to as registrations).

This means:
(i) Any plant burning non-hazardous waste or waste-derived fuels that have a net rated thermal input of less than 3 MW AND a capacity of less than one tonne per hour. This refers to both incineration and co-incineration plant. The difference between the two being that incineration is for the primary purpose of waste disposal and co-incineration is chiefly for the purpose of producing energy or materials and uses waste as a fuel in the process. Incineration in this context includes gasification and pyrolysis facilities.

(ii) Plant that has a capacity of less than one tonne per hour and is exempt from the Waste Incineration Directive - namely those burning only: vegetable waste from agriculture and forestry; vegetable waste from the food processing industry (if the heat generated is recovered); fibrous vegetable waste from paper and pulp production (if it is co-incinerated at the place of production and the heat generated is recovered); untreated wood waste; cork waste; or animal carcasses.

(iii) Crematoria

(iv) Exempt waste operations (see below)

## Registrations (new – replaced exemptions on 6 April 2010)[8]

### Chapter 2: use of waste

| Code | Description | Quantity threshold | Details / types of waste |
|---|---|---|---|
| U1 | Waste used in construction | 1,000, 5,000 or 50,000t depending on waste type | e.g. bricks, tiles, untreated wood, soil, gravel, sand, etc |
| U2 | End of life tyres in construction | 50t | Must be baled and meet PAS108 |
| U3 | Use of waste in constructing exhibits etc | 20t | Bricks, tiles, wood, plastic, metals, paper & card, textiles |
| U4 | Burning in small appliance | <50kg/hr Thermal input <0.4MW | Plant tissue, untreated wood (incl sawdust etc), vegetable waste (that can't be composted), cork & bark, fibre rejects from paper mills |
| U5 | Waste-derived | 1,000l (5,000l stored) | In motor vehicle or portable generator (<0.4MW) |

[8] From the Environmental Permitting (England and Wales) Regulations, 2010

| | | | |
|---|---|---|---|
| | biodiesel as a fuel | | |
| U6 | Use of sludge to re-seed a water treatment plant | 1000 m3 | Sewage sludge |
| U7 | Use of effluent to clean a highway gravel bed | 10m3/24hr | Waste water effluent |
| U8 | Use of waste for a specified purpose | Various | Includes shredded paper & woodchip (animal bedding), crushed glass (ornamental purposes), stones & bricks (that can be reused in current state), etc |
| U9 | Use of waste in manufacturing finished goods | Various | Includes ceramics, glass, metal, paper, plastics, wood, rubber, textiles |
| U10 | Landspreading (agricultural land) | Most types 50t / hectare (over 12mths); some waste types have other limits | Dredgings (certain types), chalk, manure, digestate, compost, milk, some ashes |
| U11 | Landspreading (non-agricultural land) | As U10 | Mostly the same as U10 |
| U12 | Spreading mulch | 100t / month | Untreated wood and plant matter |
| U13 | Spreading plant matter in place of production to confer benefit | 50t/ hectare (in any 12mth period) | Plant tissue |
| U14 | Ash to soil | 10t / hectare | Ash from burning plant tissue |
| U15 | Landspreading pig and poultry ash | 150kg / hectare (in any 12mth period) | Ash from burning pig and poultry carcasses (at site of production) |
| U16 | Depolluted end of life vehicles for parts | 2 ELVs stored at any one time | De-polluted ELVs (must not contain liquids or any hazardous substances) |

### Chapter 3: treatment of waste

| Code | Description | Quantity threshold | Details / types of waste |
|---|---|---|---|
| T1 | Cleaning, washing, spraying and coating | 300t / wk | Packaging – inc glass, plastics, composites, paper, textiles; contaminated <1% by vol |
| T2 | Recovery of textiles | 20,000t (at any one time) | |
| T3 | Heating metals to remove grease | 10t (at any one time) | |
| T4 | Baling, sorting, crushing, shredding etc | Various – depending on waste type (100t – 3000t / wk) | Cans, glass, plastic, paper, textiles, cartons, etc (segregated only) |
| T5 | Screening and blending (to produce aggregate) | 5000t / 3yrs (bituminous mixtures 50,000t / 3 yrs) | Gravel, sand, bricks, glass, wood, some ashes, etc; treatment carried out at site of production or use |
| T6 | Chipping, shredding, pulverising waste wood and plant matter | 500t / wk | Wood (untreated), plant tissue |

| | | | |
|---|---|---|---|
| T7 | Crushing & grinding waste bricks, tiles & concrete | 20t / hr | Bricks, concrete, tiles (at site of production or use) |
| T8 | Mechanical treatment of end of life tyres | 40t / wk (60t / wk for truck tyres) | Baling, re-treading, shredding, granulating, etc |
| T9 | Recovery of scrap metal | 1000t at any one time | Sorting, grading, baling, crushing, etc |
| T10 | Sorting mixed waste | 10t / wk | Plastic, metals, mixed packaging, paper, glass, textiles, etc |
| T11 | Repair or refurbishment of WEEE | 1000t / yr | Requires inspection prior to registration, is chargeable and must also be renewed after three years |
| T12 | Manual treatment | Various depending on operation & waste type (5-100t at any one time) | Bicycles, carpets, mattresses |
| T13 | Treatment of waste food | 30t at any one time | Decanting, unwrapping, bulking, sorting |
| T14 | Crushing & emptying vehicle oil filters | 1t stored at any one time | At place of production only |
| T15 | Treatment of aerosol cans | 3000 cans / yr | Puncturing / crushing (at place of production only) |
| T16 | Treatment of toner cartridges | 50,000 cartridges at any one time | Sorting, dismantling, cleaning or re-filling |
| T17 | Crushing fluorescent tubes | 3t / 24hrs | At place of production only |
| T18 | Dewatering using flocculants | 30,000 l at any one time | Clay effluent etc |
| T19 | Physical treatment of waste edible oil & fat to produce biodiesel | 5,000 l at any one time | |
| T20 | Treatment at water treatment works | 10,000m3 / yr | Various sludges |
| T21 | Recovery at water treatment works | 100,000m3 / yr | Various sewage and waste water sludges etc |
| T22 | Treatment of animal by-products at collection centre | 10t at any one time | |
| T23 | Aerobic composting and associated prior treatment | 80t at any one time if site of production and use; 60t if waste or compost is moved; some waste types have specific limits within these totals | Plant tissue, manure, forestry waste, paper & card, animal waste, kitchen waste, etc<br><br>Must result in stable compost |
| T24 | On-farm AD & burning of resulting biogas | 1,250m3 at any one time<br><0.4 MW | Plant waste and manure<br>Waste must remain in AD plant for at least 28 days<br>Does not cover landspreading digestate |
| T25 | AD at premises not used for agriculture & burning of resulting biogas | 50m3 at any one time<br><0.4 MW | Plant waste, manure, kitchen waste, animal tissue waste, paper, etc<br>Waste must remain in AD plant for at least 28 days |

| | | | |
|---|---|---|---|
| T26 | Treatment of kitchen waste in wormeries | 6t / yr | Kitchen waste, paper & card |
| T27 | Treatment of sheep dip for disposal | 8,000 l / 24 hrs | At site of production only |
| T28 | Sorting & denaturing controlled drugs for disposal | 1m3 at any one time | At site of production only |
| T29 | Treating non-haz pesticide washings by carbon filtration for disposal | 8,000 l / 24 hrs | At site of production only |
| T30 | Recovery of silver | 1,000 l at any one time | Photographic film |
| T31 | Recovering monopropylene glycol from aircraft antifreeze | 250m3 / wk | At site of production only |
| T32 | Treatment in a biobed or biofilter | 15,000 l / yr | Non-hazardous pesticide washings |
| T33 | Recovery of central heating oil by filtration | 400 l / wk | |

### Chapter 4: disposal of waste

| Code | Description | Quantity threshold | Details / types of waste |
|---|---|---|---|
| D1 | Depositing waste from dredging inland waters | <50m3 / m land deposited on / yr | On banks of waterway from which it was dredged |
| D2 | Deposit of sanitary waste on railway tracks | <25 l per discharge | From train sink or sanitary convenience<br>At place of production only |
| D3 | Burying waste from portable toilets | <1m3 / yr | At place of production only |
| D4 | Depositing agricultural plant tissue waste subject to Plant Health notice | Each pile <250t | Plant tissue waste only |
| D5 | Depositing samples for testing / analysing | 10t at any one time | At site of analysis only |
| D6 | Disposal by incineration | <50kg per hour and <0.4 MW | Any waste that is exempt from the WID (except radioactive)<br>At place of production only |
| D7 | Burning waste in the open | 10t / 24 hrs | Plant tissue, untreated wood, bark, sawdust, etc only<br>At place of production only |
| D8 | Burning at a port under a Plant Health notice | 10t / 24 hrs | Plant tissues, wood packaging etc<br>At port where waste was unloaded only |

## Chapter 5: storage of waste other than at the place of production pending its recovery or reuse

| Code | Description | Quantity threshold | Details / types of waste |
|---|---|---|---|
| S1 | Storage in secure containers | 400m3 at any one time (3m3 for oil) | Oil, plastic, cans, paper, glass, textiles, etc |
| S2 | Storage in a secure place | Various – depending on waste type | Batteries, cans, non-haz C&D, mattresses, glass, cartons, paper, plastic, scrap metal, textiles, tyres, WEEE, wood, etc<br>Specific restrictions for some waste types |
| S3 | Storage of sewage sludge | 1,250t at any one time | At place where sludge is to be used |

## Non-Waste Framework Directive exemptions (do not require registration)

| Description | Threshold | Details / types of waste |
|---|---|---|
| Temporary storage at place of production | Storage for up to 12 months | Any type of waste<br>Some ancillary treatment allowed |
| Temporary storage at place controlled by producer | 50m3 at any one time (1000 l for liquids)<br>Storage for up to 3 months | Some ancillary treatment allowed |
| Temporary storage at a collection point | 5m3 at any one time except WEEE (30m3) and any other waste that is to be recovered elsewhere (50m3) | Some ancillary treatment allowed |

## PREVIOUS exemptions – replaced by above registrations but current data will not yet reflect this (these old exemptions became obsolete in April 2010 and existing registered exemptions are moving across to the new system over the next two years; any that move into permitting will be captured in future data updates by this project)

| Description | Quantity threshold | Paragraph | Details / types of waste |
|---|---|---|---|
| Scrap metal furnaces | <25t (plant capacity) | 2 | Loading, unloading, storage |
| Storing waste prior to burning as a fuel | 25t at any one time | 3 | |
| Packaging or containers | 1,000 t at any one time | 4 | Washing etc for reuse |
| Burning waste in small appliances | <0.4 MW (net rated thermal input) | 5 | |
| Sludge on land | 250 t in 12 mths | 6 | Non-agricultural land |
| Waste for the benefit of land (incl agricultural) | Various – depending on waste type | 7 | Various plant and animal waste, sludges, compost, digestate etc subject to individual conditions |
| Storage of sewage sludge | 1,250 t at any one time | 8 | Storage at place where it will be used |
| Land reclamation or improvement | 20,000 m3 per hectare | 9 | Various inert wastes (soil, stones, ceramics, etc), sludges, compost |
| Sewage and water treatment works | 10,000 m3 per 12 mths | 10 | At works itself |
| Preparatory treatments of | Various – depending on waste type | 11 | Paper, card, plastic, glass, etc; baling, sorting, crushing etc.; preparing for recovery |

| | | | |
|---|---|---|---|
| certain wastes | | | or reuse |
| Composting | 1,000 m3 | 12 | At site of production and use |
| Construction and soil materials | Various – depending on waste type | 13 | Using C&D waste to manufacture plasterboard, bricks, etc |
| Manufacturing finished goods | 15,000t (stored at any one time) | 14 | Metal, plastics, glass, ceramic, rubber, textiles, wood, paper, card |
| Use of waste | | 15 | Beneficial use that does not amount to disposal |
| Biobeds | 15,000 l in any 12 mths | 16 | Non-hazardous pesticide solutions in a lined biobed at site of production |
| Storage in a secure place | Various – depending on waste type | 17 | Storage for the purpose of recovery |
| Waste in secure containers | 400m3 total; <20 containers | 18 | Storage for the purpose of recovery |
| Waste for construction | 50,000t total | 19 | Various inert C&D wastes, ashes and slags |
| Recovery of textiles | | 20 | Storing, cleaning, etc for reuse |
| Preparatory treatment of waste plant matter | 1,000t per week | 21 | Chipping, shredding, etc for reuse |
| Recovery of silver | 50,000 l in any one day | 22 | From printing and photographic processes |
| Recovery of animal by-products at a collection centre | 10t at any one time | 23 | |
| Crushing and grinding bricks, tiles, concrete | 20,000t at any one time | 24 | |
| Waterway dredging | 50t per day (per m of bank) | 25 | Depositing dredgings on bank |
| Recovery or disposal as an integral part of production process | | 26 | At site of production; except deposits to land |
| Baling, compacting, crushing, shredding or pulverising | | 27 | At site of production only |
| Spreading ash from incineration of pig and poultry carcasses | 150 kg per hectare in any 12 mths | 28 | At site of production only |
| Burning at site of production | 50kg per hr | 29 | Plant excluded from 5.1 of Sch1; other incinerators not used to burn clinical or municipal waste or sewage sludge |
| Burning waste in the open | 10t in any one day | 30 | Plant matter, forestry waste, park waste, etc; at site of production |
| Railway sanitary waste | 25 l per discharge | 31 | Onto tracks |
| Sanitary conveniences with removable receptacles | 5m3 per 12 mths | 32 | Burial of waste on premises |
| Peatworking | | 33 | Waste arising from extracting peat; deposit at site of production |

| | | | |
|---|---|---|---|
| Railway ballast | 10t per m of track | 34 | Depositing on land at site of production |
| Waste from prospecting | 45,000m3 per hectare in any 2 years | 35 | Mineral exploration |
| Spreading dredgings | 150t per hectare in any 12 mths | 36 | Treating agricultural land |
| Deposit of agricultural plant waste at site of production | 250t in any one deposit | 37 | |
| Samples of waste | 10t | 38 | Depositing or storing at site of testing or analysis |
| Storage of medical and veterinary waste | 5m3 at any one time | 39 | |
| Repair or refurbishment of WEEE | 5t per day | 40 | |
| Secure storage of WEEE | 80m3 for 3 mths | 41 | |
| Crushing discharge lamps | 3t in any one day | 42 | |
| Glass manufacture | 600,000 in any 12 mths | 43 | Storage of waste glass for use in production; at site of activity |
| Heating metals to remove grease and oil | <0.2MW | 44 | |
| Recovering scrap metal and dismantling end of life vehicles | Various – depending on waste type | 45 | Sorting, grading, dismantling, etc |
| Burning plant tissue waste and wood at docks | 15t in any one day | 46 | |
| Spreading diluted milk to treat agricultural land | 50m3 per hectare per day (of diluted waste) | 47 | |
| Pet burial | | 48 | Domestic pet in domestic garden |
| Temporary storage of ship waste or tank washings | 20m3 per ship for max 7 days | 49 | |
| Storing non-liquid waste pending management elsewhere | 50m3 total for max 3 months | 50 | |
| Temporary storage of scrap rails | 10t at any one time | 51 | On operational land of a railway |
| Temporary storage at site of production | Some limits for hazardous waste | 52 | |

# 8 ANNEX 2 – Waste Management Activities

**Disposal operations (source Annex I Waste Framework Directive):**

D 1 Deposit into or on to land (e.g. landfill, etc.)
D 2 Land treatment (e.g. biodegradation of liquid or sludgy discards in soils, etc.)
D 3 Deep injection (e.g. injection of pumpable discards into wells, salt domes or naturally occurring repositories, etc.)
D 4 Surface impoundment (e.g. placement of liquid or sludgy discards into pits, ponds or lagoons, etc.)
D 5 Specially engineered landfill (e.g. placement into lined discrete cells which are capped and isolated from one
another and the environment, etc.)
D 6 Release into a water body except seas/oceans
D 7 Release to seas/oceans including sea-bed insertion
D 8 Biological treatment not specified elsewhere in this Annex which results in final compounds or mixtures which are
discarded by means of any of the operations numbered D 1 to D 12
D 9 Physico-chemical treatment not specified elsewhere in this Annex which results in final compounds or mixtures
which are discarded by means of any of the operations numbered D 1 to D 12 (e.g. evaporation, drying,
calcination, etc.)
D 10 Incineration on land
D 11 Incineration at sea (*)
D 12 Permanent storage (e.g. emplacement of containers in a mine, etc.)
D 13 Blending or mixing prior to submission to any of the operations numbered D 1 to D 12 (**)
D 14 Repackaging prior to submission to any of the operations numbered D 1 to D 13
D 15 Storage pending any of the operations numbered D 1 to D 14 (excluding temporary storage, pending collection,
on the site where the waste is produced) (***)

**Recovery operations (source Annex II Waste Framework Directive):**

R 1 Use principally as a fuel or other means to generate energy (*)
R 2 Solvent reclamation/regeneration
R 3 Recycling/reclamation of organic substances which are not used as solvents (including composting and other
biological transformation processes) (**)
R 4 Recycling/reclamation of metals and metal compounds
R 5 Recycling/reclamation of other inorganic materials (***)
R 6 Regeneration of acids or bases
R 7 Recovery of components used for pollution abatement
R 8 Recovery of components from catalysts
R 9 Oil re-refining or other reuses of oil
R 10 Land treatment resulting in benefit to agriculture or ecological improvement
R 11 Use of waste obtained from any of the operations numbered R 1 to R 10
R 12 Exchange of waste for submission to any of the operations numbered R 1 to R 11 (****)
R 13 Storage of waste pending any of the operations numbered R 1 to R 12 (excluding temporary storage, pending

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