Norfolk County Council

Norfolk Minerals and Waste Local Plan Review

Waste Management Capacity Assessment 2017

June 2019

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Abbreviations

AD	Anaerobic Digestion
ACM	Asbestos Containing Material
DCLG	Department of Communities and Local Government
Defra	Department of Environment, Food and Rural Affairs
ELV	End of Life Vehicles
GVA	Gross Value Added
HIC	Household, Industrial and Commercial
HWI	Hazardous Waste Interrogator
HWRC	household waste recycling centre
IBA	incinerator bottom ash
LAWC	Local Authority Collected Waste
LPA	Local Planning Authority
MRF	Materials Recycling Facility
NPPF	National Planning Policy Framework
NPPG	National Planning Practice Guidance
NPPW	National Planning Policy for Waste
ONS	Office for National Statistics
RDF	Refuse Derived Fuel
SRF	Solid Recovered Fuel
WDI	Waste Data Interrogator
WEEE	Waste Electrical and Electronic Equipment
WFD	Waste Framework Directive
WPA	Waste Planning Authority
WTAB	Waste Technical Advisory Body

1. Introduction

This report is in four parts:

- Assessment of existing waste management capacity in Norfolk
- Assessment of waste movements to and from Norfolk
- Forecast of future waste arisings in Norfolk
- Conclusion

The first part of the report assesses existing waste management capacity at facilities in Norfolk, using information from the annual waste surveys carried out by Norfolk County Council and the Environment Agency Waste Data Interrogator. Assessment of existing waste management capacity is the first step towards ensuring that sufficient planned provision for the management of waste in the Norfolk Minerals and Waste Local Plan Review. This is in accordance with national policy to ensure that any future plan is able to take into account a robust analysis of the current provision of facilities.

The second part of the report assesses the movement of waste to and from Norfolk, including whether there are any significant waste streams moving to specific facilities, using information contained within the Waste Data Interrogator.

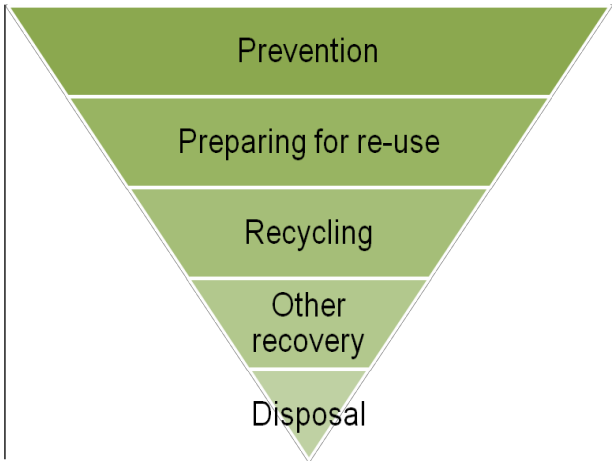
The third part of the report forecasts the quantities of waste likely to require management over the Plan period up to the end of 2036. Forecasting will use the methods set out in national guidance as being appropriate and will make use of various datasets such as Household formation projections and population growth forecasts derived from Office of National Statistics data. Forecasting for some waste streams makes use of economic growth forecasting. Data compiled from the East of England Forecasting Model will be used to establish economic growth forecasts for specific business sectors. Any gap in capacity identified would form the basis for planned provision within the Plan review.

European legislation

The overriding legislation relating to the management of waste in England is the European Waste Framework Directive. Key principles of the WFD are the waste hierarchy, the proximity principle and the principle of the self-sufficiency.

The Waste hierarchy

The following diagram of the waste hierarchy is contained in appendix A of the National Planning Policy for Waste and in the Waste Management Plan for England.



The full definition of each level of the waste hierarchy is set out in Article 3 of the revised Waste Framework Directive (2008/98/EC); and see also the Waste Management Plan for England.

The Proximity principle

The proximity principle means that the disposal of waste should take place at the nearest appropriate facility, and the recovery of mixed municipal waste collected from private households should take place at the nearest appropriate facility.

The principle of self-sufficiency

Article 16 of the WFD requires that each Member State work towards self-sufficiency in the management of waste at EU and national level.

However, it is recognised that there may be certain waste streams for which the complexity of the waste management process, and/or the volumes of waste in each area are so low that it would be unviable for a full range of waste management facilities to exist in every area.

The principles of proximity and self-sufficiency shall not mean that each Member State has to possess the full range of final recovery facilities within that Member State." Article 16 of EU Directive 2008/98

1.1. National Policy and guidance

The National Planning Policy for Waste published in October 2014 (MHCLG) contains the detailed policies for the management of waste in England. Other documents which provide policy and guidance on aspects of waste management are the National Planning Policy Framework (MHCLG, 2019), National Planning Policy Guidance (MHCLG, 2014-2019), the Waste Management Plan for England (2013), the Resources and Waste Strategy for England (Defra, 2018), the National Policy Statements on Waste Water (Defra, 2012), and Hazardous Waste (Defra, 2013), and the Waste (England & Wales) Regulations 2011 (amended 2012).

National Planning Policy for Waste (NPPW) requires that WPAs should prepare Local Plans which identify sufficient opportunities to meet the identified needs of their area for the management of waste streams. National policy requires that Waste Planning Authorities (WPAs), in preparing their Local Plans, should: "*Ensure that the planned provision of new capacity and its spatial distribution is based on robust analysis of best available data and information, and an appraisal of options. Spurious precision should be avoided;"*

The NPPW reflects the requirements and principles of the WFD. The NPPW states that WPAs should: "*plan for the disposal of waste and the recovery of mixed municipal waste in line with the proximity principle, recognising that new facilities will need to serve catchment areas large enough to secure the economic viability of the plant*."

It is important to note in the quote above that the proximity principle in relation to waste management applies to only certain waste streams and waste management facilities which are the recovery of waste from private households, and the disposal of any form of waste. It is also recognised that it may not be viable to require a full range of facilities in every area.

The NPPW states that WPAs should: "*identify the tonnages and percentages of municipal, and commercial and industrial, waste requiring different types of management in their area over the period of the plan "*

National Planning Policy Guidance states that:

"Waste planning authorities should anticipate and forecast the amount of waste that should be managed at the end of the plan period. They should also forecast waste arising at specific points within the plan period, so as to enable proper consideration of when certain facilities might be needed. However, the right balance needs to be made between obtaining the best evidence to inform what will be necessary to meet waste needs, while avoiding unnecessary and spurious precision." Paragraph: 028 Reference ID: 28-028-20141016

1.2. Waste Data Sources

Norfolk County Council waste management data

Norfolk County Council in its capacity as the Waste Planning Authority carries out an annual survey of all waste management facilities that have been granted a planning permission by the County Council. This covers the vast majority of waste management facilities in Norfolk, although the Local Planning Authorities (District, Borough and City Councils) have granted planning permissions over the years for some small-scale operations which manage waste ancillary to their main permitted use. The sites with LPA permissions tend to be small scrapyards, operating as motor spares operations, builder's yards where waste management is an auxiliary use related to building and maintenance operations, or on-farm anaerobic digestion. Therefore, the volumes of waste dealt with by these operations is relatively small.

On-farm anaerobic digestion (AD) facilities typically use as feedstock, a mixture of crops grown specifically for AD and waste from livestock or on-farm food processing. In order for the AD process to be successful it is usually the case that non-waste inputs form the majority of the feedstock. Therefore, applications are normally determined by the Local Planning Authority as a non-waste use.

Norfolk County Council has an adopted Core Strategy Policy which safeguards waste management facilities with a throughput of over 20,000 tonnes per annum. The purpose of Core Strategy Policy CS16 is to safeguard these sites from development proposals which would prevent or prejudice the use of the safeguarded sites for waste management purposes, unless suitable alternative provision is made. These larger waste management facilities can be viewed on the interactive Policies Map via the Norfolk County Council website at: https://norfolk.opus4.co.uk/planning/localplan/maps/globalmap and selecting the map layer called 'existing waste sites over 2000tpa'.

As well as the larger sites which are safeguarded, the annual waste survey is also sent to the smaller waste management facilities granted planning permission by the Waste Planning Authority.

Norfolk County Council in its capacity as the Waste Disposal Authority maintains detailed records of the amounts of Local Authority Collected Waste that is collected by the Waste Collection Authorities (District, Borough and City Councils) and by Waste Disposal Authority (the County Council). This data is submitted to central government and is available through the "Waste Data Flow" application. It is acknowledged in national policy and guidance that the Waste Data Flow information on LACW represents the most accurate information public available on the quantities of waste managed.

Environment Agency waste management data

The Environment Agency maintains two databases of information obtained from returns made by sites with Environmental Permits; the Waste Data Interrogator (WDI), and the Hazardous Waste Interrogator (HWI). The WDI and HWI both report on hazardous waste, however they do it using different survey methods. The WDI records the quantities and types of waste that a permitted site deals within terms of the waste received, waste removed, and waste processed using treatment or recovery processes.

The HWI records quantities of waste using information from consignment notes which are generated when waste changes hands. This means that the HWI is recognised as having issues regarding the under-reporting of waste quantities where waste is transferred to different sites for treatment/disposal if they are in the same ownership.

Table 1: shows this issue in relationship to the total hazardous waste inputs and outputs for Norfolk as recorded in the WDI and HWI 2015 and 2016.

Table 1: comparison of hazardous waste data in the Environment Agency WDI and HWI.

EA Waste Category	WDI 2015 Inputs	WDI 2015 Outputs	HWI 2015 Inputs	HWI 2015 Outputs
Household, Industrial, commercial	2,313,562	1,329,947	N/A	N/A
Inert	1,077,538	247,298	N/A	N/A
Hazardous	85,722	76,793	35,714	65,781

EA Waste Category	WDI 2016 Inputs	WDI 2016 Outputs	HWI 2016 Inputs	HWI 2016 Outputs
Household, Industrial, commercial	2,303,371	1,363,359	N/A	N/A
Inert	1,296,904	229,692	N/A	N/A
Hazardous	64,845	43,865	11,929	40,436

In planning for waste capacity, it is prudent to ensure that sufficient provision is made for the amount of waste which is likely to need to be managed. Therefore, the higher quantity contained in the WDI for hazardous waste is more appropriate to use than the data contained in the HWI; as this has known under-reporting issues. Therefore, for all sections of this report that use Environment Agency data, the data from the Waste Data Interrogator is used and not the Hazardous Waste Interrogator.

2. Existing Waste Management Capacity

Assessment of existing waste management capacity is the first step towards ensuring that sufficient planned provision for the management of waste in the review of the Norfolk Minerals and Waste Local Plan. This is in accordance with national policy to ensure that any future plan is able to take into account a robust analysis of the current provision of facilities.

2.1 Methodology

Analysis of the waste management capacity for the existing facilities within Norfolk has been carried out. For all sites which are subject to the annual Norfolk waste survey their details have been set out in Appendix 1 and Appendix 2. All waste management facilities which have been subject to a planning permission granted by Norfolk County Council as the Waste Planning Authority are sent an annual survey request to provide information to the types and quantities of waste received at the facility.

Appendix 1 and Appendix 2 contain the following details for each site: site name, site address, site operator, site type, whether the site is temporary or permanent and if temporary the end date of the permission.

In order to assess the existing capacity for each site, the following details have been collated for each site:

- Site Operator
- Summary of proposed development from application
- Relevant planning permission numbers
- Permitted waste processes
- Whether the site is active
- Whether permission is temporary or permanent and if temporary the end date of the permission.
- Environment Agency Permit and/or Waste Management License no.
- Amount of waste processed according to the Environment Agency WDI 2015.
- Amount of waste processed according to the returns of the Norfolk Waste Survey for the five years since the adoption of the Norfolk Minerals and Waste Core Strategy (2012-2017).

The maximum total annual waste inputs for each site have been collated by each waste management process type (shown in Table 2).

2.2 Assessment of existing waste management capacity

Having analysed the waste survey returns for each site it has become clear that there can be considerable variance in the amount of waste that is been brought in to each site from one year to the next. Waste management operates in a commercial market place and securing a contract to deal with waste from a particular company or organisation will have a significant effect on the amount of waste managed at a particular site.

For a large number of sites, it would appear from the data that the most significant limiting factor in the amount of waste input is its availability, and that in years where greater amounts of waste are available the level of waste input for some sites also increases.

To take this into account in analysing the existing capacity, the maximum waste input quantity for each site has been collated to reach a maximum waste input figure for each waste process based on five years' data (2012-2017).

However, it should be noted that there is no definitive evidence that these maximums are absolute. It is considered likely that for a number of sites if there was an increase in waste available above these maximums it could be appropriately managed.

Table 2: waste management capacity based on maximum site inputs

Waste management Facility categories	Maximum capacity based on surveyed site maximum inputs (Tonnes) (2012-2017)
Composting	362,129
Inert recycling	289,594
Metal recycling	153,811
Soil recycling	166,000
Transfer and Treatment	1,065,482
Chemical treatment and disposal	98,870
Transfer Stations and HWRC	233,287
Anaerobic digestion (on-farm, LPA permission)	24,808
Incineration and animal disposal	885
Total	**2,394,866**

For the five years of survey data used, there has been a growth in total waste inputs of between 25-75% in different categories of waste management facilities; however, the years of the highest total waste input for Norfolk do not necessarily correlate with the highest waste inputs for all surveyed sites.

Waste management facilities which hold an Environmental Permit from the Environment Agency are required to submit annual returns to the Environment Agency, which include total waste inputs.

This information is available on the Waste Data Interrogator and has been used to validate the data submitted as part of the Waste Survey. It has been found that whilst not exactly the same the figures are comparable, and there are few significant discrepancies.

The figures produced by the analysis of the total waste capacity of existing surveyed sites within Norfolk, for the period 2012-2017 indicates that they have a capacity to deal with at least 2.33 million tonnes of waste per annum, up 0.12mt from the maximum capacity calculated last year for 2012-2016. This figure includes on-farm anaerobic digestion facilities permitted by the district planning authority, which are not included in Table 3. Household Waste Recycling Centres (HWRCs) are included within the waste survey but have not been included within the waste management capacity figure as they act only as collection and transfer points.

In addition to this capacity, there are a number of treatment facilities at Anglian Water's Water Recycling Centres which receive sewage from Norfolk and surrounding Waste Planning Authority areas. Some processes within these Anglian Water facilities are not subject to Norfolk County Council's annual waste survey. Following analysis of the Waste Data Interrogator it has been found that the additional capacity at these Anglian Water facilities is just over 735,000 tonnes per annum. There is also a power station at Thetford which uses chicken litter as fuel; but it is not one of the sites which is sent a waste survey form. This power station consumed just over 475,000 tonnes of chicken litter in 2016-2017, down 5,000 tonnes from 2015-2016.

Table 3: Waste quantities managed in Norfolk by facility type

Facility Type (safeguarded sites above 20,000 tpa)	2016-17	2015-16	2014-15	2013-14	2012-13	Maximum capacity based on site maximum inputs (2012-2017)
Composting	189,250	184,221	179,305	199,618	248,994	349,696
HWRC	56,288	46,935	56,177	52,990	41,297	60,942
Inert recycling	165,890	175,780	129,427	79,405	65,702	211,217
Metal recycling	62,291	73,000	73,709	109,299	128,781	153,811
Soil recycling	166,000	166,000	166,000	166,000	0	166,000
Transfer	126,120	124,922	116,143	131,377	97,976	157,886
Transfer/ treatment	822,875	762,020	694,218	604,363	600,144	993,541
Chemical Treatment, disposal	94,796	61,429	78,106	98,870	23,169	98,870
Total	**1,683,510**	**1,594,307**	**1,493,085**	**1,441,922**	**1,205,063**	**2,191,963**

Facility Type (sites below 20,000 tpa)	2016-17	2015-16	2014-15	2013-14	2012-13	Maximum capacity based on site maximum inputs (2012-2017)
Agricultural waste/collection	38	38	38	45	0	45
Composting	11,809	12,432	11,362	10,365	10,621	12,432
Incinerator	535	473	454	471	454	559
Inert recycling	38,179	57,512	74,523	46,251	17,231	78,377
Knackers Yard	326	326	326	326	326	326
Transfer	13,214	6,163	6,607	6,216	7,518	14,459
Transfer/ Treatment	48,317	43,865	45,598	35,569	44,263	71,941
Total of smaller facilities	**110,147**	**120,810**	**138,908**	**99,243**	**80,413**	**178,139**
Total of all facilities	**1,793,657**	**1,715,117**	**1,631,993**	**1,541,165**	**1,285,476**	**2,370,102**

Source: NCC Waste Survey returns

2.3 Landfill capacity

Norfolk has no non-hazardous landfills which are currently operational. However, there are two permitted sites with 5.09 million tonnes of void space, as of 31 March 2017, both of which have been mothballed. These sites, at Blackborough End and Feltwell, have the potential to reopen to accept waste if demand for landfill was to increase. The last few years have seen a marked change in the market, with a rapid growth in Refuse Derived Fuel (RDF) production which has replaced most disposal of residual waste at landfills. A planning application is currently being determined to change the waste type for the majority of one site, from non-hazardous to inert. If granted, this would reduce the amount of non-hazardous void space in Norfolk to 1.53 million cubic metres. There would be a consequent increase in the inert landfill void space of an additional 2.23 million cubic metres (3.33 million tonnes).

Inert landfills and restoration of mineral workings using inert waste, provide locations for the deposit of wastes such as soils; only a small proportion of which can be recycled as a

marketable product. Inert waste used in quarry restoration may be a recovery operation if it aids restoration of the site. Void space at inert landfills and mineral workings was 1.95 million tonnes, as of 31 March 2017.

2.4 Additional permitted capacity

Since the last waste survey was conducted several planning permissions have been granted (in the period up to end of March 2019) which increase either landfill capacity or waste throughput capacity. These are summarised in the table below.

Facility Type	Waste Type	Throughput per annum(tonnes)
Transfer/Treatment	Non-hazardous and/or inert	30,000
Inert recycling	Inert	134,500
Composting	Green waste	2,000
Transfer	LACW	5,000
Transfer/Treatment (RDF production)	Municipal, C&I, CD & E, WEEE	150,000 (5,000 WEEE)
Transfer/Treatment	Tyres (baling)	28,000

Facility Type	Waste Type	Additional capacity (tonnes)
quarry restoration	Inert	734,328

The additional throughput increases the maximum waste management capacity for Norfolk by 349,500 tonnes per annum. The additional inert waste capacity for quarry restoration creates just over 734,000 tonnes of additional void space.

2.5 Summary of existing waste management capacity in Norfolk

As stated above, the amount of waste managed by individual sites fluctuates from year to year. It is considered that this may be in response to the availability of waste on the market and the ability of operators to secure contracts to manage waste from producers. The data for the last five years of Norfolk County Council's waste survey has been analysed to take the maximum amount of waste managed for each individual site and then aggregate this, to arrive at the total maximum capacity for all Norfolk waste management facilities, based on the amount of waste that they have managed in the past. This total is 2.33 million tonnes of waste management capacity within sites that take part in the waste survey, minus the capacity of the HWRCs. There is also an additional 0.35 million tonnes of waste management capacity from facilities gaining planning permission since the last waste survey.

Therefore, Norfolk has known existing capacity to deal with at least 2.68 million tonnes of waste per annum, although there may be the potential for some existing facilities to work at higher levels if sufficient waste was available. The ability for existing waste management facilities to deal with differing amounts, dependent on the availability of waste is clear from the total amounts of waste dealt with, during the period analysed.

In addition to this, 735,000 tonnes of sewage waste were treated at facilities connected to Anglian Water's Water Recycling Centres.

In addition to capacity at existing facilities, Norfolk also has a number of mineral extraction sites using imported inert material and it is considered that these sites will meet the capacity requirements for the inert waste arisings that are unsuitable for recycling, over the Plan period. The capacity of the permitted inert landfill and quarry restoration sites is 2.68 million tonnes, including additional capacity permitted since the last survey.

Norfolk also has two non-hazardous waste landfill sites that are not currently receiving waste but have a remaining void capacity of 5.09 million cubic metres. A planning application is currently being determined to change the waste type for the majority of one site, from non-hazardous to inert. If granted, this would reduce the amount of non-hazardous void space in

Norfolk to 1.53 million cubic metres. If granted it would increase the amount of inert landfill voidspace by 2.23 million cubic metres (3.33 million tonnes).

The power station at Thetford also consumed just over 475,000 tonnes of used chicken litter; however, the power station has operating at greater capacity in the past. The waste received at this power station has not been counted in Norfolk's waste arisings, therefore this capacity has not been included in the total available waste management capacity.

3. Waste movements to and from Norfolk

This chapter provides information on the movements of waste to and from facilities within Norfolk, using the Environment Agency's Waste Data Interrogator.

Table 4: shows the quantities of waste received at and removed from waste management facilities in Norfolk which complete annual returns to the Environment Agency (in accordance with the Environmental Permitting regime). Some waste sites operate under an exemption from permitting and these do not need to complete an annual return to the Environment Agency.

The Environment Agency has three broad categories for waste reported using the Waste Data Interrogator (WDI); Household, Industrial, Commercial (HIC), Inert, and Hazardous Waste.

Table 4: Waste Data Interrogator inputs and outputs to waste management facilities in Norfolk 2015 to 2017

EA Waste Category	WDI 2015 Inputs (tonnes)	WDI 2015 Outputs (tonnes)	WDI 2016 Inputs (tonnes)	WDI 2016 Outputs (tonnes)	WDI 2017 Input (tonnes)	WDI 2017 Outputs (tonnes)
Household, Industrial, commercial	2,313,562	1,329,947	2,303,371	1,363,359	2,162,012	1,472,639
Inert	1,077,538	247,298	1,296,904	229,692	1,109,931	184,798
Hazardous	85,722	76,793	64,845	43,865	36,030	20,200
Total	3,476,822	1,654,038	3,665,120	1,636,916	3,307,973	1,677,637

As the WDI records waste movements, this means that there is an element of double-counting inherent within the system. Waste may be received at a facility in Norfolk where it is subject to sorting; the sorted waste may then be sent to another facility (which may or may not be in Norfolk) where more specialised treatment processes are carried out. Therefore, the same waste may be input and output through a number of sites prior to the residue being ultimately recovered or disposed of. Also, waste which is treated to become a product instead of a waste (for example, compost or aggregate), would not be recorded on the WDI when exported from the site.

There are also some facilities which, while receiving waste, do not appear within the Waste Data Interrogator because of the way such facilities are classified. In Norfolk, the Thetford Power Station is one of these. This plant is fuelled by chicken litter, but it is classified as a power station rather than a waste management facility and consumes approximately 480,000 tonnes of litter per annum. Although it is thought that the majority of this waste is from Norfolk and surrounding counties within the East of England, there is no requirement for the origin to be recorded, as it is through the WDI for waste management facilities.

3.1 Inputs to Norfolk's waste management facilities

3.1.1 Household, Industrial and Commercial waste

The WDI shows that between 2015 and 2017, waste facilities in Norfolk received approximately 1 million tonnes more HIC waste than these facilities output. Some treatment

facilities will process waste such that residues will have either ceased to be waste, or will have been reduced in weight, for example, through a composting process. Residues, if they have ceased to be waste, may be able to be recovered by, for example, spreading to land for agricultural improvement.

3.1.2 Inert waste

Inert waste quantities also show a similar trend to HIC between inputs and outputs. In 2015 to 2017 over 1 million tonnes of inert waste was received, per annum, at waste management facilities, but less than 250,000 tonnes of inert waste was output. There are a number of facilities in Norfolk which incorporate secondary aggregate recycling facilities to produce substitute aggregate from inert waste, and there are existing or former mineral workings where the residue from such facilities is used in what is classified as a recovery operation to aid beneficial restoration. Therefore, inert waste received at a facility may be recycled into a product and not be recorded as a waste when it leaves the site.

3.1.3 Hazardous waste

The WDI shows that inputs to facilities within Norfolk exceeded outputs by approximately 9,000 tonnes per annum in 2015, just under 21,000 tonnes in 2016, and approximately 16,000 tonnes in 2017. The types of hazardous waste moving in and out of Norfolk are discussed in more detail later in this chapter. There are facilities within Norfolk which treat hazardous waste, for example a site takes hazardous liquid wastes, and after treatment the residual waste is only about 20% of the input tonnage (for example where oil is separated from water).

3.2 Outputs from Norfolk's waste management facilities

The WDI contains information on what happens to the waste after it has left the facility, this is known as its 'fate'. It may be that waste goes for either disposal, or recovery, or moves on to another treatment facility, or is transferred on to be bulked up prior to another processing stage.

Table 5: Waste fates for outputs from Norfolk facilities in 2015-2017

Waste fates	WDI 2015 HIC output (tonnes)	WDI 2016 HIC output (tonnes)	WDI 2017 HIC output (tonnes)	WDI 2015 Inert output (tonnes)	WDI 2016 Inert output (tonnes)	WDI 2017 Inert Output (tonnes)	WDI 2015 Hazardous output (tonnes)	WDI 2016 Hazardous output (tonnes)	WDI 2017 Hazardous output (tonnes)	WDI 2015 all waste Output (tonnes)	WDI 2016 all waste Output (tonnes)	WDI 2017 all waste Output (tonnes)
Incinerator	228,737	280,520	279,592	0	0	887.2	370	335	409	229,107	280,855	280,889
Landfill	124,731	93,170	176,659	18,462	16,656	13,246	5,348	372	368	148,541	110,198	190,273
Recovery	492,653	542,124	552,266	169,854	152,460	109,080	17,317	12,649	14,031	679,824	707,233	674,835
Transfer	100,906	105,048	151,388	15,795	30,738	32,147	3,409	6350	4,619	120,110	142,136	188,153
Treatment	119,340	133,498	125,652	12,384	2,607	2,977	4,157	286	653	135,881	136,391	129,282
Unknown	263,580	208,999	187,082	30,803	27,231	26,461	46,192	23,874	120	340,575	260,104	213,663
TOTAL	**1,329,947**	**1,363,359**	**1,472,639**	**247,298**	**229,692**	**184,798**	**76,793**	**43,866**	**20,201**	**1,654,039**	**1,636,917**	**1,677,095**

Source EA Waste Data Interrogator 2015, 2016 and 2017

3.2.1 Incinerators that receive significant quantities of Norfolk's waste are located in Suffolk, Kent, and outside the UK because Norfolk has no incinerators for dealing with residual HIC waste. Some of Norfolk's residual waste is processed into Refuse Derived Fuel (RDF) before being sent to an incinerator for energy to be recovered from the waste. Waste processed into RDF may be recorded under the 'incinerator' fate or under the 'recovery' fate, as the fate recorded is at the site operator's discretion. For some types of hazardous waste such as clinical waste, and animal carcases, incineration (with or without energy recovery) may be the most effective waste management process.

3.2.2 Landfill is the disposal of waste and is still a fate for approximately 11% of Norfolk's waste according to the WDI, this may be residual waste for which recovery or incineration are not appropriate methods of final treatment. However, as is noted elsewhere in this assessment, the WDI is subject to input errors by operators. An operator in Great Yarmouth, recorded just under 115,000 tonnes of waste as going to landfill in Great Yarmouth. As Great Yarmouth has no operational non-hazardous landfills, this was investigated further with the Environment Agency. This was actually a discharge of water to ground through a drainage interceptor on a site and should not have been recorded within the WDI.

3.2.3 Recovery includes recycling, composting and anaerobic digestion. Recovery also includes the recovery of energy from waste (either directly to an incinerator or firstly processed into RDF) provided the incinerator meets the R1 definition of recovery operation as set out in the Waste Incineration Directive. The waste management processes of composting, anaerobic digestion and separation of recyclables could alternatively be recorded under the 'treatment' fate, whilst the recovery of energy from waste may be recorded under the 'incinerator' fate; this is because the fate recorded is at the operator's discretion. In terms of tonnage, recovery is the most significant fate for Norfolk's waste. Norfolk has a Materials Recovery Facility (MRF) located at Costessey, which receives source segregated recyclables from Local Authority Collected Waste. There are also MRF plants in Doncaster and Kent which also receive a proportion of Norfolk's waste collected by commercial operators. Metals are the other significant fraction where recovery is the ultimate fate of the waste, as the metals are transferred to reprocessing plants both inside and outside the UK. Another example of recovery would be inert waste residues which are used in quarry restoration schemes which reach certain criteria or the recycling of inert wastes (such as concrete) into secondary aggregate.

3.2.4 Transfer and treatment are fates for a significant proportion of waste leaving waste management facilities in Norfolk. This indicates the incremental nature of much of the waste management industry where waste received at a site may be subject to a process, prior to its movement to another facility for another process, each stage removing or recovering a proportion of the waste. For example, some waste received at a HWRC will be subject to treatment processes at composting facilities or at metal recycling facilities.

3.2.5 The **unknown** fate designation covers all other potential fates which are not covered by the preceding fates described above. Analysis of the waste to which an unknown fate has been attributed shows that much of the waste (173,000 tonnes) was deposited in lagoons in Norfolk. Virtually all of the remainder (23,000 tonnes) was mixtures of concrete, soils, stones and other mixed construction and demolition wastes.

3.3 Household, Industrial and Commercial (HIC) waste movements from Norfolk

Table 6 shows the movements of Norfolk's waste to facilities located in other waste planning authority areas in 2017. The greatest tonnage of waste movements from Norfolk is to outside the UK; this is primarily the export of RDF to incinerators; paper, card and plastics for export to reprocessors, and the shipment of metals to reprocessing plants for recovery and recycling.

The next most significant movements of waste are to the neighbouring counties of Suffolk and Cambridgeshire.

In Cambridgeshire, approximately 20,000 tonnes of waste exported from Norfolk is metals to a recycling operation at the Port of Wisbech; it is likely that ultimately this waste is exported for reprocessing. A waste transfer station which receives approximately 25,000 tonnes of Norfolk's Local Authority Collected Waste (LACW) for processing into RDF is located at Wisbech. Cambridgeshire also received just under 16,000 tonnes of landfill leachate for specialist processing. Milton, Grunty Fen, and Buckden North landfill sites, in Cambridgeshire, received approximately 23,000 tonnes of Norfolk's HIC waste in 2017. Norfolk does not currently have any operational non-hazardous landfill sites, although considerable void space still exists, as the operators have mothballed the two sites in Norfolk. It is likely that the quantity of waste landfilled, per annum is significantly below the threshold for the viable operation of a landfill, based on records from the landfills previously operational in Norfolk.

Suffolk has an incinerator at Great Blakenham, and there is an agreement between Norfolk and Suffolk County Councils for a proportion of Norfolk's LACW to be dealt with at this plant. Nearly 40,000 tonnes of waste went to Great Blakenham, according to the WDI 2017. Mason's landfill in Suffolk received just over 9,000 tonnes of Norfolk's HIC waste.

Waste Planning Authority areas which also received significant quantities of waste from Norfolk were Kent, Lincolnshire, and Doncaster. In Kent, this relates to waste going to the incinerator and co-located MRF, at Allington. In Lincolnshire, the largest amount of waste is going to an incinerator, with landfill leachate going to a specialist treatment facility also a significant waste movement. A MRF and RDF/SRF processing plant at Doncaster also receives a proportion of waste from Norfolk sent by commercial operators.

Several large scale industrial operations within Norfolk send waste directly to waste management facilities which are not located in Norfolk. Due to the way in which the WDI recorded data, these direct exports are not recorded as waste removed from Norfolk because the waste was never handled at a waste management facility located within Norfolk. The direct exports only appear within the WDI as waste received by other WPAs.

Analysis of waste received by all other WPAs in England has identified several direct exports from Norfolk. De-inking sludges from Palm Paper, a newsprint reprocessing plant in Norfolk, are sent to plants in Cheshire, Gloucestershire, and Devon where they are recycled into animal bedding. Wood waste is sent from South Norfolk to a recycler in Thurrock. Waste was also sent from Norfolk direct to a landfill in Cambridgeshire by the waste management company that operates the landfill site. While these three significant direct exports account for just under half of all records that are considered to be direct exports, the rest of the total is made up of a number of smaller volumes to a number of different WPAs. The analysis of waste received at other WPAs indicates that just over 150,000 tonnes of Norfolk's waste are direct exports to these other WPAs.

During analysing the Norfolk waste received by other WPAs in England it has become apparent that there are a number of inconsistencies between the waste recorded as going to particular WPAs by the Norfolk waste management facilities and the records of waste received at facilities in those WPAs. As well as volumes which could be attributed as direct exports, there are also cases where the amount recorded as being sent from Norfolk to a WPA significantly exceeds the amount of waste that is recorded as being received from Norfolk by that WPA. An example of this is the volume of waste recorded as being sent to Lincolnshire from Norfolk (23,687 tonnes), this is significantly more than Lincolnshire have recorded as receiving from Norfolk (5,487).

There may be several reasons for these inconsistencies; the waste data returns are manually completed, so it relies on the operator to know in which county and/or WPA the facility that they are sending waste to, is located. It is considered that waste received by North Lincolnshire WPA may either be a direct export or may have been erroneously recorded as going to Lincolnshire. It is considered that this may be the case for a number of potential direct exports. Another possible reason for the variance could be that the receiving facility, may be an exempt facility, an EFW facility, or an incinerator as these sites do not complete returns for the WDI.

Due to the difficulties in determining where double counting between WPAs may have taken place a worse-case scenario has been assumed in terms of waste quantities arising in Norfolk. Waste volumes recorded as being removed from Norfolk to other WPAs through the WDI are counted, and where there is a positive variance between what is recorded as being sent to a WPA from Norfolk and what a WPA has recorded as being received from Norfolk, the amount that could be a direct export is also counted , in order to determine where significant waste movements may take place which would be subject to engagement in relation to the Duty to Cooperate.

Table 6: Household, Industrial and Commercial waste movements from Norfolk to other Waste Planning Authorities (over 1,000 tonnes per annum)

Destination Waste Planning Authority	Total tonnes waste	Comments
Norfolk	739,882	
Outside UK	278,163	RDF, paper/card/plastics; metals
Suffolk	175,989	municipal/clinical wastes; incinerator, landfill, metals, sewage sludge,
Cambridgeshire	77,775+(24,154 direct export)	ELV/metals, RDF processing, Sewage sludge, landfill, landfill leachate(direct)
East of England (WPA not codeable)	32,495	mixed non-hazardous waste, ELV/metals
South East (WPA not codeable)	29,369	metals
Peterborough UA	7,234+(19,534 direct export)	RDF, WEEE, metals
Thurrock UA	1,127+(23,172 direct export)	Wood
Lincolnshire	23,687	RDF, ELV/metals, gypsum containing waste
Cheshire East	910+(21,137 direct export)	de-inking sludge(direct)
Doncaster	15,085	RDF
Kent	14,515	RDF, glass, ELV/metals, gypsum containing waste
Essex	8,756+(4,132 direct export)	street cleaning residues
Northamptonshire	3,154+(6,571 direct export)	plastic and rubber, paper and cardboard
Nottingham UA	8,955	ELV/metals
Bedfordshire (WPA not codeable)	8,164	food waste
Barking & Dagenham	5,575	metals, RDF
London (WPA not codeable)	4,648	ELV/metals, textiles
Hertfordshire	4,589	wood, sewage sludge, ELV/metals
Liverpool	115+(4,148 direct export)	Edible oil and fat, metals
North Lincolnshire UA	4,187 direct export	Food processing waste
Leicestershire	3,825	sewage sludge
East Riding of Yorkshire UA	48+(3,192 direct export)	Wood waste
Worcestershire	3,085	RDF
Devon	156+(2,922 direct export)	de-inking sludge(direct)
Nottinghamshire	2,942	RDF, ELV
East Midlands (WPA not codeable)	2,848	ELV/metals
Harrow	2,746	metals
East Sussex	2,638	metals
Lancashire	156+(2,197 direct export)	Paper pulp rejects
Yorks & Humber (WPA not codeable)	1,846	plastic and rubber, wood, metals, RDF
Milton Keynes UA	215+(1,767 direct export)	Food processing wastes
Buckinghamshire	1,544	RDF
Sheffield	1,460	metals
West Midlands (WPA not codeable)	1,335	metals
Walsall	1,239	liquid wastes
Derbyshire	1,191	ELV/metals

Source: EA Waste Data Interrogator 2017

3.4 Household, Commercial and Industrial (HIC) waste movements to Norfolk

Norfolk's waste management facilities receive waste from other Waste Planning Authorities, as well as waste produced within Norfolk, as shown in Table 7. The greatest tonnage received is from Suffolk - this is predominately sewage sludge (nearly 300,000 tonnes) which is treated at the three treatment plants at Whitlingham, Thetford and King's Lynn. Sewage sludge also forms the majority of waste from Cambridgeshire which is managed in Norfolk; just over 108,000 tonnes is received at the three treatment works. The King's Lynn sewage sludge treatment facility also receives just over 27,000 tonnes of sludge from Lincolnshire. There is an ash treatment facility in Norfolk which receives Incinerator Bottom Ash (IBA) and flyash from the chicken litter power station at Thetford, which is treated prior to being used in the manufacture of construction materials, which replaces primary mineral.

Waste is received from Kent, and Lincolnshire by commercial operators, this is likely to be backhaul from the export of waste to facilities in or near these areas.

Table 7: Household, Industrial and Commercial waste movements to Norfolk from Waste Planning Authorities (over 1,000 tonnes per annum)

Origin WPA	Origin Region	Tonnes received	Main waste types
Norfolk	East of England	1,515,855	Sewage Sludge, food processing waste, landfill leachate, municipal waste, IBA and flyash
Suffolk	East of England	354,156	Sewage sludge
Cambridgeshire	East of England	126,280	Sewage sludge, metals
WPA not codeable (East of England)		93,028	Metals, wastes for treatment
Lincolnshire	East Midlands	32,365	Sewage sludge, metals
Kent	South East	15,106	Municipal waste fractions, metals
Essex	East of England	13,419	Sewage sludge
Northamptonshire	East Midlands	1,967	Sewage sludge
Hertfordshire	East of England	1,412	Sewage sludge
WPA not codeable (Bedfordshire)		1,283	Sewage sludge
Liverpool	North West	1,156	Paper and cardboard
Leicestershire	East Midlands	1,005	Sewage sludge

Source: EA Waste Data Interrogator 2017

A significant part of the waste received by facilities in Norfolk could not be identified to a Waste Planning Authority (WPA). The Waste Data Interrogator is derived from returns made by operators to the Environment Agency; and relies on the accuracy of the data contained on the return. In some cases, the origin of the waste may have been recorded in a way which does not allow a WPA to be identified. The majority of the waste in this 'Not codeable' category was received at Metal Recycling Sites (MRSs). Regardless of its origin, these volumes are included with the overall waste movements and they are received at facilities within Norfolk for treatment.

There is a variance between the total amount of waste originating in Norfolk which was received at Norfolk facilities in Table 7 (1,515,855 tonnes); and waste exported from a Norfolk facility to another Norfolk facility (739,882 tonnes). This variance is because some waste originating within Norfolk; such as sewage sludges and food processing wastes; are treated so that they may either not leave as waste, or be spread to land, or discharged, or are reduced significantly in volume by the treatment. The volume of such wastes originating in Norfolk accounts for the variation between the totals.

Table 7.1 HIC waste categories received at Norfolk waste management facilities which are likely to be treated to be reduced in volume, no longer be a waste or be discharged

Waste received likely to be treated at facility or discharged etc	Tonnage
Sludges from treatment of urban waste water	276,660
Food processing sludges from washing and cleaning	204,730
Animal faeces, urine and manure (including spoiled straw), effluent, collected separately and treated off-site	64,012
Biodegradable waste	129,544
Landfill leachate	42,890
Septic tank sludge	10,665
Plant-tissue waste	9,748
Biodegradable kitchen and canteen waste	8,375
TOTAL	**746,624**

Source: EA Waste Data Interrogator 2017

3.5 Hazardous waste movements to Norfolk

National guidance and policy states that WPAs should recognise that certain specialist waste streams do not produce sufficient volumes in each Waste Planning Authority area to make facilities viable in every planning area. This is the case with many waste streams which are broadly categorised as hazardous waste. Hazardous waste is generated at far lower volumes than HIC waste, and due to its nature waste management facilities treating this waste are more specialist and need to draw waste from a far larger area in order to be economically viable. Table 8 shows the quantities received into Norfolk facilities from various WPA areas.

Norfolk has some hazardous waste treatment facilities for specialist waste streams which receive waste at a national level, whilst some specialist waste streams produced in Norfolk are exported to facilities in other Waste Planning Authority areas.

There is a Hazardous waste transfer station linked to a business specialising in asbestos removal which receives material from across England. While the annual quantity received is less than 100 tonnes, this is however an important facility for such a specialised waste stream.

There is a facility for recycling fluorescent tubes at Attleborough. This is another specialised waste stream for which only limited facilities are required nationally to meet market demand, although there is one other facility in Norfolk that also recycles fluorescent tubes. Both these facilities receive waste from across the country. Norfolk's two Waste Electrical and Electronic Equipment (WEEE) recycling facilities also receive electrical goods and fridges/freezers from across the country.

Table 8: Hazardous waste received by Norfolk facilities from all Waste Planning Authorities (over 10 tonnes per annum).

Origin Waste Planning Authority	Origin Region	Tonnage received	Comments for waste totals over 10 tonnes
Norfolk	East of England	25,385	ELV, liquid wastes, waste oils, WEEE
WPA not codeable (East of England)	East of England	4,260	ELV, lead batteries, clinical waste, asbestos waste
Suffolk	East of England	2,520	Waste oils, WEEE, fridges and freezers, waste paint and varnishes
Essex	East of England	791	Fluorescent tubes, waste oils, WEEE
Cambridgeshire	East of England	677	ELV, Fridges and freezers, fluorescent tubes, WEEE, Waste paints and varnishes
WPA not codeable (Yorks & Humber)	Yorks & Humber	444	Fluorescent tubes
Cumbria	North West	376	Liquid wastes, waste oil
Leicester UA	East Midlands	274	WEEE
WPA not codeable (South East)	South East	201	Clinical waste
Rutland UA	East Midlands	146	WEEE, fridges and freezers
Luton UA	East of England	113	WEEE
WPA not codeable (East Midlands)	East Midlands	90	ELV
Northamptonshire	East Midlands	81	WEEE, fridges and freezers
Kirklees	Yorks & Humber	58	Fluorescent tubes
Lincolnshire	East Midlands	56	Fluorescent tubes, WEEE, fridges and freezers
Devon	South West	49	Fluorescent tubes
Warwickshire	West Midlands	43	Fluorescent tubes
WPA not codeable (Bedfordshire)	East of England	34	WEEE, waste water from interceptors
Buckinghamshire	South East	32	Spent water filtration resins, fridges and freezers, WEEE
Birmingham City	West Midlands	30	Fridges and freezers, WEEE
Hertfordshire	East of England	26	WEEE, fridges and freezers, fluorescent tubes
Scottish WPA	Scotland	24	Fluorescent tubes
Bedford	East of England	20	Fridges and freezers, WEEE
WPA not codeable (Wales)	Wales	20	Fluorescent tubes
WPA not codeable (West Midlands)	West Midlands	18	Fluorescent tubes
Sandwell	West Midlands	15	WEEE, fridges and freezers
Coventry	West Midlands	12	WEEE, fridges and freezers

Source: EA Waste Data Interrogator 2017

3.6 Hazardous waste movements from Norfolk

After bulking up, the fridges/freezers received at facilities in Norfolk are transferred to facilities in other areas specialising in the decommissioning of such equipment. As Norfolk has no hazardous landfill capacity, due to the underlying geology being generally incompatible with such disposal, a significant part of the residual hazardous waste in Norfolk is ultimately received at the hazardous waste treatment facility and landfill at King's Cliffe in Northamptonshire.

Analysis of waste received by all other WPAs in England has identified occasions when waste arising in Norfolk is sent direct to waste management facilities which are not located in Norfolk. Due to the way in which the WDI recorded data, these direct exports are not recorded as waste removed from Norfolk because the waste was never handled at a waste management facility located within Norfolk. The direct exports only appear within the WDI as waste received by other WPAs.

Fly ash and contaminated soils are sent to a residual hazardous waste management site in Northamptonshire. Waste washing liquors from the production of crop protection chemicals is sent from a plant at Norwich to a treatment facility near Leeds. Discarded fridges and freezers are sent to a management facility in Lincolnshire. While, these three significant direct exports account for just over half of all records that are considered to be direct exports, the rest of the total is made up of a number of smaller volumes to a number of different WPAs. The analysis of waste received at other WPAs in England indicates that just over 14,000 tonnes of Norfolk's hazardous waste may be direct exports to these other WPAs.

In analysing the Norfolk waste received by other WPAs it has become apparent that there are a number of inconsistencies between the waste recorded as going to particular WPAs by the Norfolk waste management facilities and the records of waste received at facilities in those WPAs. As well as volumes which could be attributed as direct exports, there are also cases where the amount recorded as being sent from Norfolk to a WPA significantly exceeds the amount of waste that is recorded as being received from Norfolk by that WPA. An example of this is the volume of waste being recorded as being sent to Cambridgeshire (3,128 tonnes), this is significantly more than Cambridgeshire have recorded as receiving (534 tonnes).

There may be several reasons for these inconsistencies, the waste data returns are manually completed, so it relies on the operator to know in which county and/or WPA the facility that they are sending waste to, is located. It is considered that waste received by Peterborough UA WPA may either be a direct export or may have been erroneously recorded as going to Cambridgeshire. It is considered that this may be the case for a number of potential direct exports.

Due to the difficulties in determining where double counting between WPAs may have taken place a worse-case scenario has been assumed in terms of waste quantities arising in Norfolk. Waste volumes recorded as being removed from Norfolk to other WPAs through the WDI are counted, and where there is a positive variance between what is recorded as being sent to a WPA from Norfolk and what a WPA has recorded as being received from Norfolk, the amount that could be a direct export is also counted , in order to determine where significant waste movements may take place which would be subject to engagement in relation to the Duty to Cooperate.

Table 9: Hazardous waste received by facilities in any WPA arising from Norfolk (over 10 tonnes per annum).

Destination WPA	Destination Region	Tonnes Removed	Comments for waste totals over 10 tonnes
Norfolk	East of England	3,977	ELV, waste oils and fuels, batteries
Cambridgeshire	East of England	3,128	Fridges and freezers, WEEE, waste oils and fuels
Leeds	Yorks & Humber	2,392 direct export	Washing water from production of crop protection chemicals
Northamptonshire	East Midlands	2,106+(5,579 direct export)	Waste oils, fly ash, contaminated soils and stones
Bristol UA	South West	1,465	ELV, aqueous liquid wastes
Peterborough UA	East of England	115+(1,196 direct export)	ACM, WEEE
Derbyshire	East Midlands	1,263	Lead batteries, residual waste
Suffolk	East of England	1,160	ELV, ACM
Lincolnshire	East Midlands	677+(527 direct export)	Lead batteries, fridges and freezers
Hammersmith & Fulham	London	627	Fridges and freezers
Nottingham UA	East Midlands	329+(303 direct export)	WEEE, Clinical waste
Nottinghamshire	East Midlands	8+(600 direct export)	Waste oils and oil filters
Northern Ireland	Northern Ireland	573	ELV
Kent	East of England	283+(210 direct export)	Aqueous liquid wastes, lead batteries
Scottish WPA	Scotland	483	Aqueous liquid wastes, oil filters and absorbents
Telford & Wrekin UA	West Midlands	462	Fridges and Freezers
Essex	East of England	424	ELV, Lead batteries, fridges and freezers
Hertfordshire	East of England	20+(396 direct export)	Waste oils, oil/water separator contents
Outside UK	Outside UK	375	ELV
Worcestershire	West Midlands	354	WEEE
Birmingham City	West Midlands	315	WEEE
County Durham UA	North East	4.4+(285 direct export)	Aqueous liquid wastes
Sheffield	Yorks & Humber	165+(125 direct export)	Batteries, contaminated packaging, aqueous liquid wastes
Flintshire UA	Wales	266	Residual waste
Walsall	West Midlands	65+(130 direct export)	Washing water from production of crop protection chemicals, Waste oil emulsions, fridges and freezer, lead batteries
East Sussex	South East	154	Lead batteries
WPA not codeable (East of England)	East of England	142	Interceptor sludges, lead batteries
Staffordshire	North West	56+(69 direct export)	Waste solvents, Oil filters and absorbents
Leicestershire	East Midlands	122	Fridges and freezers
Lancashire	North West	119	ELV

Destination WPA	Destination Region	Tonnes Removed	Comments for waste totals over 10 tonnes
Manchester	North West	109	ELV
WPA not codeable (West Midlands)	West Midlands	101	ELV
Knowsley	North West	91	Waste paint, varnish and adhesives
Kingston Upon Hull UA	Yorks & Humber	79	Waste oil and fuel
WPA not codeable (Cheshire)	North West	76	Organic solvents
Kingston Upon Thames	London	60	Waste oils
Cornwall	South West	51	WEEE
WPA not codeable (Yorks & Humber)	Yorks & Humber	51	ELV
Kirklees	Yorks & Humber	44	WEEE
Wakefield	Yorks & Humber	41	Aqueous liquid wastes, Waste paint and varnish
St Helens	North West	32	Fridges and freezers
Trafford	North West	32	Batteries
Surrey	South East	23	Waste sludges
Dudley	West Midlands	21	Contaminated packaging
Hertfordshire	East of England	20	ELV
Rotherham	Yorks & Humber	18	Lead batteries
North Yorkshire	Yorks & Humber	17	ELV
Central Bedfordshire	East of England	15	Lead batteries
WPA not codeable (South London)	London	12	ELV
Warwickshire	West Midlands	11	Batteries
Stoke-on-Trent UA	West Midlands	10	Fluorescent tubes

Source: EA Waste Data Interrogator 2017

3.7 Inert Waste movements to Norfolk

The inert waste category within the Waste Data Interrogator includes Construction, Demolition and Excavation waste, as well as a proportion of waste from LACW which is inert and separated as part of the recycling process. Due to the relative weight to value of most inert wastes, management tends to take place close to where the waste arises. Mineral workings often require a certain amount of inert waste to aid restoration, and the largest amounts of inert waste are received at mineral operations. It is common for these operations to incorporate inert waste recycling as part of their business, with suitable waste recycled into secondary aggregate, with recovery through quarry restoration often being the fate for inert waste such as soils, although a proportion would be screened and potentially blended to create a topsoil product.

Table 10: Inert waste received by facilities within Norfolk in 2017 (over 100 tonnes per annum)

Origin WPA	Origin Region	Tonnes	Comments
Norfolk	East of England	900,341	Soil and stones, mixed C&D waste, concrete, and minerals
WPA not codeable (East of England)	East of England	178,220	Soil and stones, mixtures of concrete, bricks and tiles, and concrete
Suffolk	East of England	28,688	Soil and stones, mixed C&D waste, mixtures of concrete, bricks and tiles, bricks, gypsum based material, and glass
Cambridgeshire	East of England	1,632	Mixed C&D waste, mixtures of concrete, bricks and tiles, and soil and stones
Lincolnshire	East Midlands	1,028	Soil and stones, mixtures of concrete, bricks and tiles

Source: EA Waste Data Interrogator 2017

3.8 Inert waste movements from Norfolk

Glass forms a part of the inert waste stream, and as a higher value item travels further for reprocessing; glass bottles may be suitable for crushing and reprocessing into glass containers. Flat glass is unsuitable for such reprocessing but is recovered by crushing and grinding to form a sand substitute used in asphalt and abrasives manufacture.

Specialist facilities in Lincolnshire and Kent recycle the majority of the gypsum based waste materials, such as plasterboard, removed from Norfolk's waste management facilities. The recycled material is used in the cement industry and by plasterboard manufacturers.

Table 11: inert waste received by facilities in any WPA arising from Norfolk in 2017 (over 100 tonnes per annum)

Destination WPA	Destination Region	Tonnes	Comment
Norfolk	East of England	137,134	58k mixtures of concrete, bricks; 38k soil and stones; 8.5k concrete; 8k bricks; 4k wood
Sheffield	Yorks & Humber	12,376	12k glass, plastic
Suffolk	East of England	12,075	5.5k minerals, 3.5k soil and stones, 3k mixtures of concrete, bricks
Kent	South East	6,753	5.5k glass, 1k gypsum based material
WPA not codeable (East of England)	East of England	3,773	soil and stones
Derbyshire	East Midlands	3,005	glass
Wakefield	Yorks & Humber	2,006	glass
WPA not codeable (Yorks & Humber)	Yorks & Humber	1,780	1k glass
Lincolnshire	East Midlands	1,530	1.5k gypsum based material, soil and stones
Essex	East of England	1,123	all glass
Cambridgeshire	East of England	982	500 glass, metals, minerals, plastic, wood
Outside UK	Outside UK	862	all cables
Scottish WPA	Scotland	821	all wood
North-East Lincolnshire UA	Yorks & Humber	338	all gypsum based material
North Lincolnshire UA	Yorks & Humber	107	all gypsum based material

Source: EA Waste Data Interrogator 2017

3.9 London Waste

Waste Planning Authorities are required to plan for a proportion of London's Waste. Norfolk has not received significant quantities of waste from London, in comparison with those WPAs located closer to London or WPAs located where better transport links makes the movement of waste more efficient. The WDI data for 2012-2017 shows a significant fall in the volumes of London's waste which is being received at facilities within Norfolk.

Table 12: Waste from London received at waste management facilities in Norfolk

Waste Type	2012	2013	2014	2015	2016	2017
HIC waste (tonnes)	16,805	8,720	625	920	1,680	98
Inert waste (tonnes)	5	160	15	15	0	0
Hazardous waste (tonnes	260	160	175	370	68	108
Total Waste (tonnes)	17,070	9,040	815	1,320	1,748	206

Source: EA Waste Data Interrogator (totals are rounded and may not sum)

Analysis of the composition of London's waste which is managed in Norfolk over this period indicates a very significant reduction in the quantities of separated LACW (paper and cardboard) received. In 2012, such waste was received from a greater number of London Boroughs than in 2016, dropping substantially again in 2017; this may be as the result of a change in contractor, the opening of an alternative site outside Norfolk, or a change in market viability. In 2016, over 90% of the waste from London received in Norfolk was paper and cardboard. However, in 2017 paper and cardboard made up less than 0.5% of the total. Over half the total waste was received at a few specialist facilities which manage specific parts of the hazardous waste stream (waste electricals and fluorescent tubes).

The quantities of waste imported into Norfolk from London are very small when compared to the quantities of waste from London imported into the other Waste Planning Authority areas in the East of England, as shown in the table below:

Table 13: Waste from London received at facilities in the East of England

WPA	2012	2013	2014	2015	2016	2017
Bedfordshire authorities	101,469	305,382	472,657	241,929	232,405	310,196
Cambridgeshire & Peterborough	80,722	65,486	114,504	336,792	679,346	758,318
Essex & Southend-on-Sea	867,777	1,644,501	1,820,556	1,311,074	1,436,742	1,183,829
Hertfordshire	684,298	747,755	703,455	973,704	821,218	676,867
Norfolk	17,073	9,045	815	1,302	1,748	206
Suffolk	16,276	24,324	10,296	1,559	4,463	5,722
Thurrock	1,445,714	2,163,622	1,941,733	2,018,316	2,099,484	2,701,190
Total	**3,213,329**	**4,960,116**	**5,064,017**	**4,884,675**	**5,275,406**	**5,636,328**

Source: Environment Agency Waste Data Interrogator

If waste from London continues to be received in Norfolk this will be as part of commercial contracts with waste management companies. As the quantities of London's waste received in Norfolk are no more significant than for the majority of other WPAs from which Norfolk receives waste no special action is required to plan specifically for London's waste within the Minerals and Waste Local Plan Review.

3.10 Next Steps

The East of England WTAB has agreed that for the purposes of the Duty to Cooperate, thresholds on the amount of waste transferred between WPA areas should apply. The thresholds are: 2,500 tonnes per annum of non-hazardous waste (HIC), 100 tonnes per annum of hazardous waste and 5,000 tonnes per annum of inert waste (CD&E). Therefore, Norfolk County Council will be contacting all the identified WPAs which receive amounts of waste above these thresholds, so that we can engage with them in accordance with the duty.

3.11 Conclusions on waste movements to and from Norfolk

The waste management industry operates across borders, both administrative within the UK, and international borders. Waste that arises in Norfolk is transported to many facilities outside the county boundary. There is also a significant flow of waste into facilities in Norfolk which has arisen in other WPA areas. For many waste management processes there are thresholds below which facilities are not economically viable, and the waste management industry is market driven, so commercial facilities are unlikely to be developed if it is not considered that sufficient waste could be processed. The type of facilities likely to be developed to take advantage of waste from an area greater than that covered by one WPA would be those to treat specialised waste streams, particularly hazardous wastes, or waste streams which require costly infrastructure to process them. In Norfolk, significant amounts of waste such as metals, waste oils, glass and batteries are transferred to facilities in other areas for reprocessing.

Waste streams often pass through several waste management facilities, where sorting, separation, bulking up and treatment takes place for wastes that have not been segregated at source. Therefore, the efficient recycling of waste often relies on a network of smaller waste management facilities which can separate and bulk up particular waste streams prior to delivery to larger waste treatment facilities.

Approximately a third of the HIC waste received at waste management facilities in Norfolk originates from outside the county. The majority of this is either sewage sludge for treatment, or metals for separation and bulking up prior to onward transfer. Norfolk receives a significant amount of sewage sludge from other counties because Anglian Water has invested in the development of specialist treatment facilities at three of Norfolk's Water Recycling Centres.

Norfolk does not have any residual waste treatment facilities for the final recovery of Local Authority Collected Waste (previously known as municipal waste). After the waste has been through this process the majority is either bulked up and transported to incinerators at Great Blakenham (in Suffolk) and Allington (in Kent) or processed into Refuse Derived Fuel (RDF). The majority of RDF is exported to incinerators in Europe.

The general movement of waste between Norfolk and other WPA areas is based on the locations of the nearest appropriate facility for particular waste streams (which may be outside the WPA area boundary); or is driven by commercial priorities (such as when an operator transfers waste to a particular waste treatment facility in another WPA area, and imports waste from that area probably as backhaul loads to mitigate costs). It is considered that such cross-boundary movements between WPA areas generally cancel each other out. Therefore, all WPAs should plan for net-self-sufficiency in waste management facilities.

Hazardous waste is generated at far lower volumes than HIC waste, and due to its nature, facilities treating this waste are more specialised and need to draw waste from a far larger area to be viable. As Norfolk has no hazardous landfill capacity, a significant part of the residual hazardous waste in Norfolk is ultimately received at the hazardous waste treatment facility and landfill site at King's Cliffe in Northamptonshire.

Overall, the movement of waste into and out of Norfolk's waste management facilities is the result of the interaction of commercial priorities in a contract driven industry and the need for many waste facilities to have a suitably sized area from which to draw material in order for them to be viable. As Norfolk has a significant border with the sea, it is unsurprising that relatively few final treatment facilities are located here, and that a significant movement of waste is outside of the UK.

4. Forecast of future waste arisings in Norfolk

This chapter forecasts the waste quantities likely to arise within Norfolk for the plan period to 2036. These forecasts are made using a variety of data sources, including population forecasts, results from the annual waste surveys carried out by Norfolk County Council and the Environment Agency Waste Data Interrogator. National Policy states that in forecasting for future waste arisings, spurious precision should be avoided; this is due to the forecasts being based on projections at a large scale. The forecasts will be used to inform the Minerals and Waste Local Plan Review by assessing likely future waste capacity requirements, based on the forecast waste arisings compared to existing capacity and movements of waste.

4.1 Methodology

Local Authority Collected Waste (previously known as 'municipal waste') is a significant part of the waste stream. To forecast future arisings national guidance suggests that a growth profile should be the starting point. The growth profile should be based on household or population growth and waste arisings per household or per capita.

National guidance provides additional detail on how the growth profile for LACW should be prepared.

- calculate arisings per head by dividing annual arisings by population or household data to establish short- and long-term average annual growth rates per household and
- factor in a range of different scenarios, e.g. constant rate of growth, progressively lowering growth rates due to waste minimisation initiatives.

The Office of National Statistics (ONS) compiles regular population and household growth projections, and these provide a robust basis for such forecasts. Local Planning Authorities also carry out Strategic Housing Market Assessments, which forecast future housing need using population and household formation projections, but which also take into account local factors. The ONS published 2016 based population projections in May 2018; however, Government advice has been that due to changes in the way the projections have been calculated for this iteration, it does not provide a suitable dataset for the calculation of future housing, and that the 2014 based projection should continue to be used for these purposes. Therefore, forecasts for waste streams based on population/household projections have continued to use the 2014 data.

Creating forecasts for waste streams other than LACW is less precise. This is because, as local authorities are responsible for collection and management of LACW, the data on the total amounts of LACW managed are more robust.

A growth profile for **commercial and industrial waste** can be created to forecast future arisings. National planning guidance states that:

- forecasts for commercial and industrial waste arisings should be based on a growth projection;
- Waste Planning Authorities should set out clear assumptions on which any growth projection is based, and should consider different assumptions if necessary; and
- A certain level of growth in arisings should be assumed unless there is clear evidence to demonstrate otherwise.

Forecasting for future **construction and demolition waste** arisings is less certain due to the incomplete information for this waste stream. National guidance states that Waste Planning Authorities should assume a constant level of arisings as a starting point.

National guidance states that the Environment Agency WDI information for **hazardous waste** is considered to be robust and that growth projections for this waste stream should be made by projecting forward trends from time-series data. Facilities dealing with hazardous waste are almost invariably going to be operating under the Environmental Permitting regulations rather than an exemption due to the nature of the waste.

4.2 Total waste quantities managed

The total amounts of waste currently received, by waste management facilities in Norfolk, and removed from them is recorded for those sites which operate under the Environmental Permitting regulations. This is covered in more detail within the chapters on existing waste management capacity and movements of waste.

A summary of total amounts of waste inputs to and outputs from waste management facilities in Norfolk with Environmental Permits is shown below.

Table 14: Waste inputs and outputs to Norfolk waste management facilities 2015 - 2017

EA Waste Category	WDI 2015 Inputs	WDI 2015 Outputs	WDI 2016 Inputs	WDI 2016 Outputs	WDI 2017 Inputs	WDI 2017 Outputs
Household, Industrial & Commercial	2,313,562	1,329,947	2,303,371	1,363,359	2,162,012	1,472,639-(114,620 error)
Inert	1,077,538	247,298	1,296,298	229,692	1,109,931	184,798
Hazardous	85,722	76,793	64,845	43,865	36,030	20,200

Source: Environment Agency Waste Data Interrogator

The WDI does not classify wastes in the same way as planning policy. Therefore, the total quantities of wastes within the WDI will be composed of LACW, C&I, CD&E, hazardous, and waste such as sewage sludge and agricultural waste received at facilities operating under the Environmental Permitting regime. The waste classification codes used in the WDI are such that some waste planning categories would be split between them; for example LACW would contain a proportion of waste classified as Household, Industrial and Commercial (HIC); a proportion that would be inert, and a proportion would be hazardous. Therefore, it is not possible to directly relate quantities in the EA Waste Data Interrogator to the quantities in each category in planning terms, although the total amount is useful. Due to the way the permitting return operates, by recording the movement of waste, the potential exists for waste to be double-counted as it moves through multiple transfer and treatment facilities prior to the residue being either sent to a recovery or disposal location. Therefore, the quantity of waste recorded as managed at waste management facilities is not the same as the quantity of waste arising.

4.3 Local Authority Collected Waste arisings

Waste from Households in Norfolk is collected by the district, borough and city councils in their capacity as Waste Collection Authorities (WCAs). Some WCAs also collect a proportion of trade waste which is similar in composition to the waste obtained from households. Household Waste Recycling Centres also receive a proportion of waste produced by households. Norfolk County Council is the Waste Disposal Authority and is responsible for the treatment, recovery and/or disposal of LACW. LACW has the most robust system for the recording of quantities of waste that is collected and treated and/or sent for recovery or disposal. There is a national system for recording quantities of LACW called WasteDataFlow, which is funded by Defra. Therefore, the data on LACW quantities and destinations is considered to be the most accurate of all the waste streams.

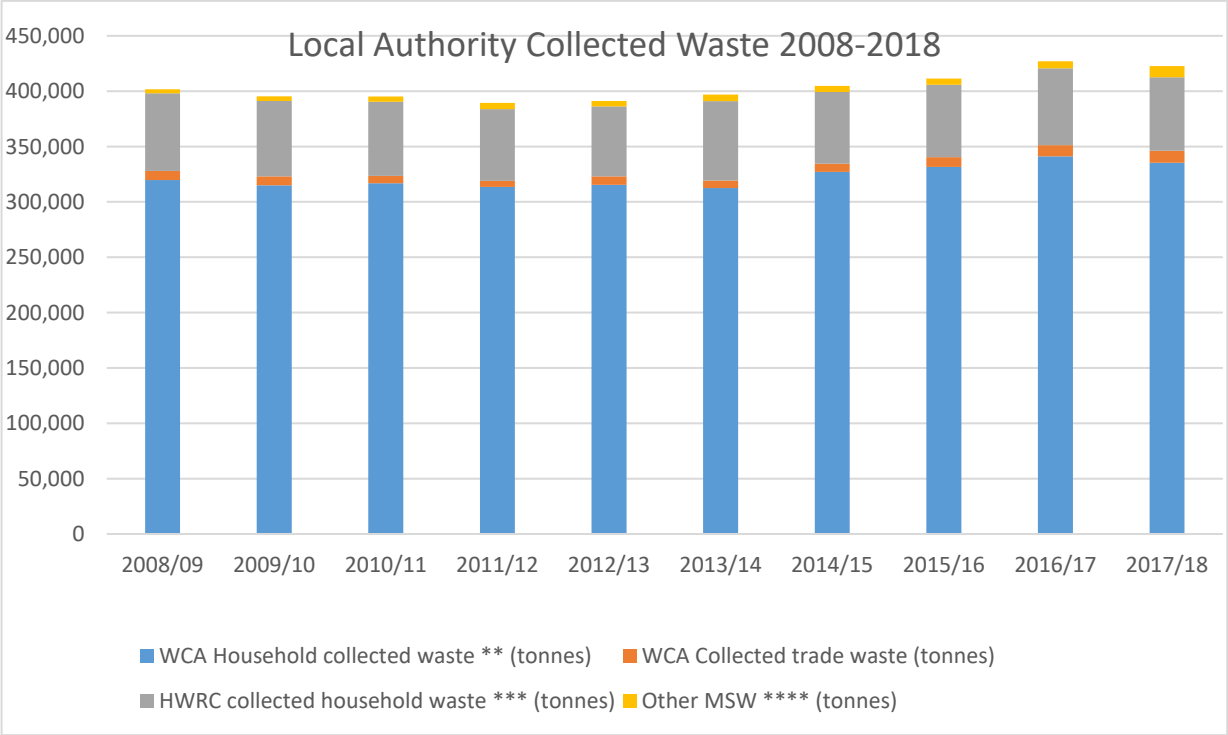
The following table and graph below shows the total LACW received for the period 2007-2018.

Table 15: Local Authority Collected Waste arisings summary 2007/08 to 2017/18

Year	WCA Household collected waste ** (tonnes)	WCA Household collected waste ** (%)	WCA Collected trade waste (tonnes)	WCA Collected trade waste (%)	HWRC collected household waste *** (tonnes)	HWRC collected household waste *** (%)	Other MSW **** (tonnes)	Total MSW arisings (tonnes)
2007/08	326,614	80%	8,595	2%	71,455	17%	3,524	410,188
2008/09	319,677	80%	8,276	2%	70,143	17%	3,616	401,712
2009/10	314,975	80%	8,025	2%	68,109	17%	4,303	395,412
2010/11	316,906	80%	6,639	2%	66,930	17%	4,729	395,204
2011/12	313,544	81%	5,425	1%	64,832	17%	5,579	389,380
2012/13	315,462	81%	7,574	2%	63,158	16%	4,896	391,090
2013/14	312,503	79%	6,749	2%	71,780	18%	5,935	396,967
2014/15	327,139	81%	7,359	2%	64,817	16%	5,403	404,718
2015/16	331,556	81%	8,801	2%	65,394	16%	5,645	411,396
2016/17	341,082	80%	10,126	2%	69,400	16%	6,439	427,048
2017/18	335,340	79%	10,860	2%	66,370	18%	10,102	422,672

Source: Waste Disposal Authority

** household waste, kerbside recycling, fridges, flytipping and beach cleansing waste
*** excluding rubble ****rubble and abandoned vehicles



Source: NCC Waste Disposal Authority

** household waste, kerbside recycling, fridges, flytipping and beach cleansing waste

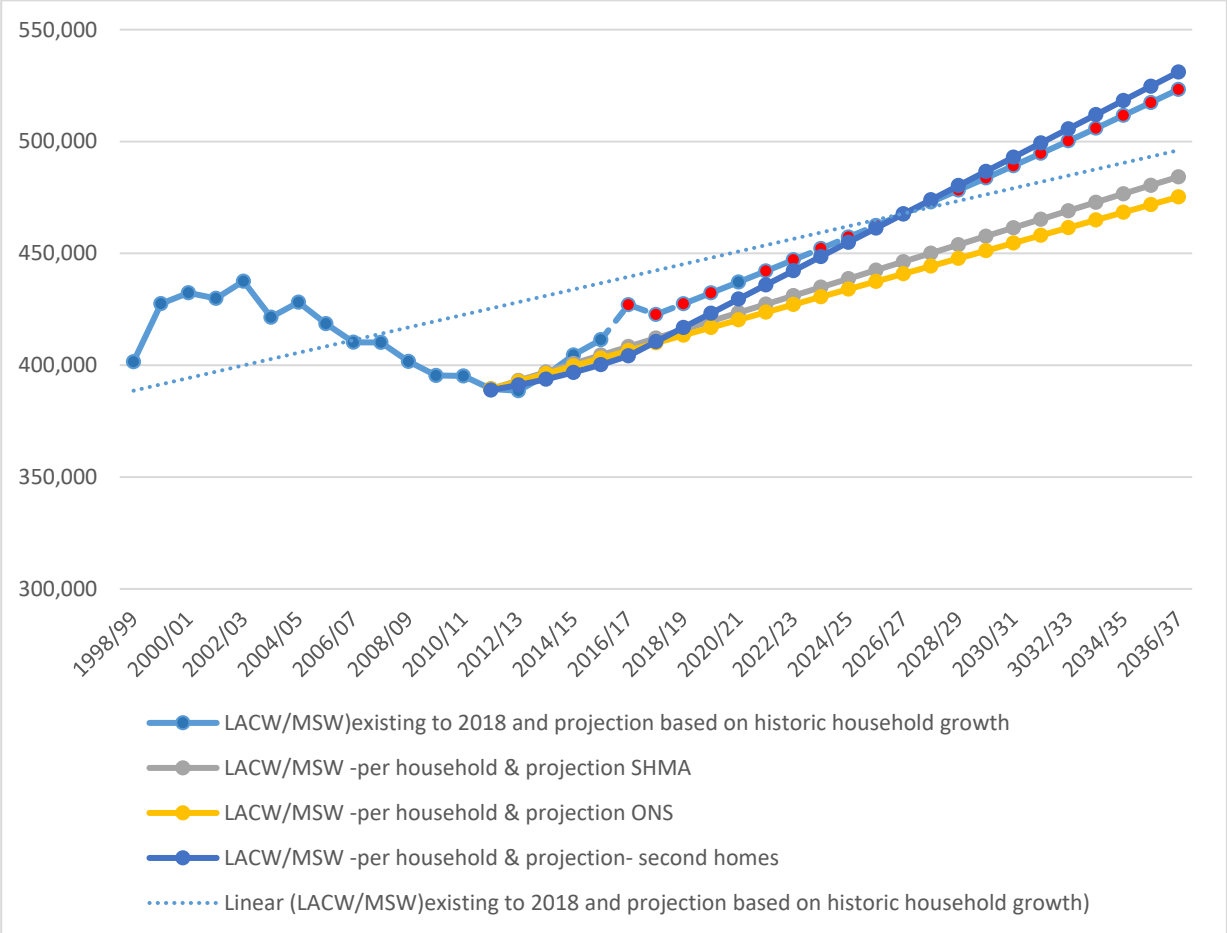
*** excluding rubble ****rubble and abandoned vehicles

4.4 LACW growth projections to 2036

Data for LACW is recognised as being the most robust for any waste stream. National planning policy guidance states that a growth forecast should be developed using household formation and population growth forecasts as a basis.

There are a number of growth scenarios to consider when forecasting future LACW arisings. The following household and population growth forecasts have been used to create different potential scenarios for LACW growth up to the end of the Plan period, as illustrated on the graph below. The base year for the ONS forecasts is 2011, and this date is used to calculate the LACW forecasts based on the following scenarios:

- Actual LACW arisings from 1998/99 up to 2017/18 have been plotted, and then projected forward based on historic household growth continuing.
- Office for National Statistics (ONS) household and population growth forecasts.
- Norfolk's Local Planning Authorities household and population growth forecasts produced for their Strategic Housing Market Assessments. The Norfolk forecasts use ONS data as a basis, but take into account some local factors, and as a result forecast a slightly higher level of household formations due to the larger proportion of single or small households as a result of the larger than average proportion of older people in the Norfolk population.
- The Norfolk LPA forecast also has a further scenario based on the additional demand for dwellings based on the growth of second homes in some parts of the county.



The LACW growth scenarios take a precautionary approach and assume that the amount of waste generated per household will remain the same for the whole Plan period; in order to ensure enough future capacity to meet predicted arisings. While there are several initiatives and aspirations which could lead to a reduction in the amount of waste produced by households, there is currently insufficient evidence of any reduction per household on which to

base a robust future scenario. LACW per dwelling was relatively static between 2009 and 2014, following falls in the early 2000's. From 2015 there was an increase in LACW per dwelling, this likely to a result in changes in the recycling regime which allowed the inclusion of glass within recycling collections.

Table 16: Tonnage of LACW arising per dwelling

Year	2006 /07	2007 /08	2008 /09	2009 /10	2010 /11	2011 /12	2012 /13	2013 /14	2014 /15	2015 /16	2016 /17	2017 /18
LACW per dwelling (tonnes)	1.07	1.05	1.02	1.00	0.99	0.97	0.97	0.98	0.99	1.00	1.03	1.1

Source: Norfolk County Council Waste Disposal Authority

Analysis of previous LACW waste quantities seems to indicate a potential correlation between the quantities of waste and economic activity. Waste quantities decreased slightly during the recession following the 'Credit Crunch' of 2009 (see Table 16); this may well have been as the result of households deferring spending for non-essential items and reducing overall household budgets. It is likely that up to the end of 2036 Norfolk is likely to see at least one economic cycle, and therefore assuming a given level of growth overall should smooth any variations in economic activity.

Table 17: Comparison of household growth scenarios on forecast waste arisings

	Annualised % change	2016-2020	2021-2025	2026-2030	2031-2036
Growth Scenario		**Local Authority Collected Waste Tonnes per annum**			
Household average growth (past trend)	1.38	437,163	462,427	489,152	523,267
Household growth (SHMA)	0.97	419,720	442,474	461,437	484,191
Household growth (ONS)	0.88	416,856	437,464	454,636	475,244
Household growth with second homes allowance (SHMA)	1.52	428,499	466,552	498,264	536,318

The table above shows the forecast tonnes per annum for LACW for interim dates within the Plan period; the amount shown is for the end year of each interim period. The highest forecasts are for the growth scenario based on past trends continuing and the growth scenario based on an allowance for a continued demand for second homes in Norfolk. Both of these scenarios reflect the significant growth in second homes in north and north-west Norfolk; however, following changes to taxation on such properties it is considered that these scenarios may over-estimate the continued growth. The scenario based on ONS household growth uses a set of national assumptions, while the scenario used by the Strategic Housing Market Assessment takes into account local factors for Norfolk.

It is considered that the growth scenario used by the Strategic Housing Markets Assessments is the most appropriate one to be used to forecast future waste arisings for Norfolk because it takes into account local factors but does not assume unfettered continued growth in the number of second homes. One of the most significant local factors is the growth in small households, due to the demographic profile of some parts of Norfolk. This preferred growth scenario assumes a 20% increase in the annual tonnage of LACW over the Plan period, which equates to an increase of just under 1% each year. If waste reduction initiatives prove successful over the Plan period they will reduce this rate of increase. The table below shows the forecast quantities of LACW in Norfolk over the Plan period using the 0.97% annual growth scenario.

Table 18: LACW in Norfolk growth forecast to 2036

Year	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22
LACW	408,342	412,135	415,927	419,720	423,512	427,304	431,097
Year	**2022/23**	**2023/24**	**2024/25**	**2025/26**	**2026/27**	**2027/28**	**2028/29**
LACW	434,889	438,682	442,474	446,267	450,059	453,852	457,644
Year	**2029/30**	**2030/31**	**2031/32**	**2032/33**	**2033/34**	**2034/35**	**2035/36**
LACW	461,437	465,229	469,021	472,814	476,606	480,399	484,191

4.5 Commercial and Industrial Waste (non-hazardous)

Commercial and Industrial waste is a significant waste stream which is of an equivalent size to LACW. However, due to the nature of the waste management industry which deals with this waste stream data is less robust. C&I waste is produced largely by private sector businesses and the companies which collect and manage the waste are also in the private sector. While many of these are national companies and have robust internal systems for quantifying the amounts of waste that they deal with; this information is not published in a way which easily enables its use by waste planning authorities. Many of the companies operating in this sector must complete returns to the Environment Agency as part of the requirements of their Environmental Permits. This data, whilst useful, is known to suffer from errors or emissions. Due to the way the permitting return operates, by recording the movement of waste, the potential exists for waste to be double-counted as it moves through multiple transfer and treatment facilities prior to the residue being either sent to a recovery or disposal location. Therefore, the quantity of waste recorded as managed at waste management facilities is not the same as the quantity of C&I waste arising. Central government recognises that it is extremely difficult to estimate C&I waste generation due to the lack of the robustness in the data, leading to an increased level of uncertainty.

National planning guidance states that:

- forecasts for commercial and industrial waste arisings should be based on a growth projection;
- Waste Planning Authorities should set out clear assumptions on which any growth projection is based, and should consider different assumptions if necessary; and
- A certain level of growth in arisings should be assumed unless there is clear evidence to demonstrate otherwise.

National estimates by Defra for C&I waste arisings (UK Statistics on waste, Defra, October 2018 revised update) for England indicate a rise of 1.1mt between 2010 (32mt) and 2016 (33.1mt). This equates to an average increase of 0.6% per annum. The October 2018 update has revised the Defra methodology for calculating C&I waste arisings. One of the revisions has been to make an allowance for a proportion of the waste received at transfer stations to be recycled, previously waste received at transfer stations was not counted, as it was assumed that all waste at transfer stations would be counted at other waste management facilities further downstream.

Estimates of C&I waste arisings were calculated for the review of the East of England Regional Spatial Strategy in 2010; these estimates were based on research carried out on behalf of Defra which included surveys (C&I waste survey 2009, Jacobs, May 2011). The last Defra survey which examined C&I waste quantities was 2009. The RSS estimates indicated a gradual reduction in C&I waste over time as a result of improved efficiencies in waste reduction by producers.

An estimate of C&I waste arisings in Norfolk has been calculated by using the quantity of Household, Industrial and Commercial waste recorded as originating in Norfolk in 2013 in the Environment Agency's Waste Data Interrogator and subtracting the quantity of LACW waste

arising in 2013. The forecasts for C&I waste arisings will be based upon economic growth forecasts. Therefore, the base year of 2013 is being used to forecast C&I waste arisings over the Plan period because the East of England Forecasting Model uses 2013 as the base year for its economic growth forecasts.

HIC waste originating in Norfolk	**Subtract**	LACW arising in Norfolk	**Equals**	Estimate of C&I waste
1,271,985+150,000 direct export		395,486		1,026,499

A forecast of future C&I waste arisings can be developed by using forecasts of economic growth. Economic growth forecasts typically use Gross Value Added as a proxy, which is the output value added by a business to the value of its inputs. However, just because a business sector has a high GVA growth does not necessarily mean that it has high C&I waste growth. Technological change may add substantial value without increasing waste. As economic forecasts generally have a high level of uncertainty, waste forecasts derived from them are also uncertain.

The East of England Forecasting Model (EEFM) produces forecasts for Norfolk by business sector and for all sectors. The current model forecasts economic growth to 2045. The Defra Survey, for estimating C&I waste, selected business sectors seen as being representative of those generating C&I waste. By using selected business sector GVAs as a proxy for this survey a growth forecast can be established.

Table 19: Table of business sectors used for calculating C&I waste forecast

Business Sector in Defra Survey	Gross Value Added Business Sector from EEFM	Annualised % change 2016-36
Chemicals / non-metallic minerals manufacture	GVA5: Manufacturing - chemicals only GVA6: Manufacturing - pharmaceuticals	2.25 2.84
Education	GVA28: Education	0.80
Food, drink & tobacco	GVA3: Manufacturing - food manufacturing	0.47
Hotels & catering	GVA17: Accommodation & food services	2.35
Metal manufacturing	GVA7: Manufacturing - metals manufacturing	2.18
Machinery & equipment (other manufacture)	GVA4: Manufacturing - general manufacturing	0.78
Other services	GVA23: Professional services GVA31: Other services	1.16 2.97
Power & utilities	GVA10: Utilities	1.08
Public administration & social work	GVA27: Public administration	1.41
Retail & wholesale	GVA13: Wholesale GVA14: Retail	1.76 2.85
Textiles / wood / paper / publishing	GVA18: Publishing & broadcasting	-0.13
Transport & storage	GVA15: Land transport GVA16: Water & air transport	1.23 0.50

Source: East of England Forecasting Model 2017

The average annualised percentage increase for the selected business sectors that approximate to those used in the Defra survey is just over 1.5% for the Plan period.

Average annualised growth for all business sectors included in the EEFM is just under 1.9% for the Plan period. However, the variance between sectors can be high. Waste and remediation as a business sector is included in the EEFM, this is the business sector that will deal with all waste from the economy. Therefore, forecast change in this sector could be an indicator of the potential changes in waste generation. This sector has a forecast of 3.3% annualised growth over the Plan period, but is a small part of the overall economy.

Therefore, looking at all these potential scenarios, it would be appropriate to model growth forecasts for C&I waste on the growth for the business sectors which represent those sectors included in the previous Defra Survey of C&I waste. This growth is just over 1.5% per annum over the Plan period, with the latest Defra estimates for England representing a lower forecast of 0.6% (UK statistics on waste), with the East of England RSS review estimates around 1.4%. The GVA forecasts in the East of England Forecasting Model use 2013 as the base year for the forecast. Therefore, the forecasts for C&I waste generation have also used 2013 as the base year.

The previous estimates in the RSS review assumed a falling level of C&I waste as a result of increases in production efficiency and decreases in the amounts of product packaging. It is considered that the effects on C&I waste generation of potential improvements in efficiency and packaging, together with changes in the regulatory environment are uncertain. Therefore, in planning flexibly for the Plan period to ensure adequate capacity, it has been assumed that no improvements to efficiency take place.

The estimate of C&I waste arisings in 2013 is 1,026,499 tonnes. The following table shows the C&I waste growth forecast to 2036 based on an increase of just over 1.5% per annum over the Plan period.

Table 20: C&I waste growth in Norfolk forecast to 2036

Year	**2015/16**	**2016/17**	**2017/18**	**2018/19**	**2019/20**	**2020/21**	**2021/22**
C&I	1,074,340	1,090,777	1,107,466	1,124,410	1,141,614	1,159,081	1,176,814
Year	**2022/23**	**2023/24**	**2024/25**	**2025/26**	**2026/27**	**2027/28**	**2028/29**
C&I	1,194,820	1,213,100	1,231,661	1,250,505	1,269,638	1,289,064	1,308,786
Year	**2029/30**	**2030/31**	**2031/32**	**2032/33**	**2033/34**	**2034/35**	**2035/36**
C&I	1,328,811	1,349,141	1,369,783	1,390,741	1,412,019	1,433,623	1,455,558

4.6 Construction, Demolition and Excavation Waste

Data for this waste stream is highly variable in terms of accuracy and robustness. National surveys were carried out in an attempt to quantify the amount of CD&E waste; however, the last of these was carried out in 2005. These surveys acknowledged in their findings that due to errors and omissions they only represented a broad estimate.

The WPAs in the East of England work jointly as a Waste Technical Advisory Body to look at waste issues covering more than one planning area. In 2012 they carried out a survey of waste management facilities operating under exemptions from the Environmental Permitting regulations. One of the findings of this study was that record keeping for operators dealing with CD&E waste often did not record total tonnages of waste. Those operators who used mobile equipment on development sites often only recorded days of operation and for those who did transport waste off site this was often as lorries or skip quantities instead of an exact tonnage. This is because as sites exempt from environmental permitting, there was no requirement for them to make a return of waste movements to the Environment Agency. Therefore, it has not been possible to include the CD&E waste treated at exempt sites, either in terms of the quantity of waste arisings or the treatment capacity at exempt sites.

The three main waste categories in the Environment Agency WDI are inert, HIC and hazardous wastes. Whilst the WDI includes a specific waste category for CD&E waste, this category includes some hazardous waste (such as asbestos and contaminated soils). Therefore, for the purpose of forecasting waste arisings for the Minerals and Waste Local Plan Review, the quantity of waste falling within the inert waste category in the WDI has been used as a proxy for CD&E waste arisings. Any CD&E waste that is not inert will already be counted under the category of C&I waste arisings in this report. This is because C&I waste arisings have been calculated by subtracting LACW arisings from the HIC arisings, leaving all other waste that is not hazardous or inert as being counted within the C&I category.

National guidance states that Waste Planning Authorities should assume a constant level of CD&E arisings as a starting point for forecasting. 1,110,000 tonnes of inert waste arisings were produced in Norfolk in 2017 and this quantity has been forecast to stay the same for each year during the Plan period.

Any CD&E waste that is not inert or hazardous and has instead been counted within the C&I waste category has been forecast to increase by just over 1.5% per annum throughout the Plan period as discussed in the preceding section on forecasting C&I waste. Hazardous waste is dealt with separately in the following paragraphs.

4.7 Hazardous waste

Hazardous waste makes up a relatively small proportion of the total waste and the hazardous waste stream is composed of many different fractions. Due to the nature of hazardous waste, and the relatively small volumes produced in any one location, treatment and disposal facilities are often highly specialised and need a significant geographical area from which to receive waste in order to be economically viable. Virtually all the companies operating in this sector have to complete returns to the Environment Agency as part of the requirements of their Environmental Permits. This data, whilst useful, is known to suffer from errors or emissions. Due to the way the permitting return operates, by recording the movement of waste, the potential exists for waste to be double-counted as it moves through multiple transfer facilities prior to being either sent to a suitable treatment or disposal location. Therefore, the quantity of waste recorded as managed at waste management facilities is not the same as the quantity of hazardous waste arising.

4.8 Hazardous Waste forecasting

National guidance states that data returns for hazardous waste should be considered robust, and that Waste Planning Authorities should plan for future needs by using time-series data to extrapolate a growth forecast.

Due to the specialist nature of hazardous waste treatment, when calculating amounts for forecasting purposes, the amount received at waste management facilities in Norfolk has been used. This quantity includes both waste arising in Norfolk and waste arising in other parts of the country treated at specialist facilities in Norfolk. The data on hazardous waste movements shows that just over 25,000 tonnes of hazardous waste arising in Norfolk was treated at facilities in Norfolk in 2017. This hazardous waste mainly consisted of ELV, liquid wastes and electrical equipment. The significant drop in waste treated at facilities in Norfolk is due to the fall in the volumes of incinerator bottom ash and flyash (from the chicken litter power station at Thetford) being recorded as going to a waste management facility. It is thought that this material is now being used as a secondary material for a manufacturing process for construction blocks. The majority of hazardous waste treated at Norfolk's waste management facilities that arose outside Norfolk consisted of WEEE, ELV, batteries and florescent tubes.

While some hazardous waste arising in Norfolk goes directly from manufacturers to specialist facilities in other parts of the country, these volumes are lower than the total quantities of hazardous waste received at waste management facilities in Norfolk. Hazardous waste arising in Norfolk that was treated at waste management facilities located outside Norfolk mainly consisted of WEEE, ELV, batteries, oil, asbestos containing materials and contaminated soils.

It is considered that basing the forecast on the amounts received is an appropriate method for calculating future requirements for this specialist waste stream, due to the nature of the facilities required, and the need for waste arising from outside Norfolk to be received to enable the existing facilities to be viable.

Analysis of data from the WDI shows that hazardous waste managed in Norfolk has been declining since 2009. This is in line with the national trend, in the Defra 'Digest of waste and resources' 2018; which shows that from 2010 to 2014 hazardous waste in England reduced from 4.7mt to 4.3mt. There were increases in 2008-2009, as a result of the introduction of the WEEE regulations and the extension of the regulations regarding End-of-Life Vehicles (ELV). The time series has been taken with 2009 as a base year, because data prior to that does not reflect the current regulatory environment, and it is considered that the current situation in relation to those parts of the waste stream is likely to continue through the Plan period.

Table 21: Hazardous waste received at Norfolk waste management facilities 2008-2017

Year	2009	2010	2011	2012	2013	2014	2015	2016	2017
Hazardous waste received (WDI)	121,037	119,917	117,962	110,449	103,381	99,018	85,722	64,845	36,030
%change year on year	0.00	-0.93	-1.63	-6.37	-6.40	-4.22	-13.43	-24.35	-44.44

Source: Environment Agency Waste Data Interrogator

Quantities of hazardous waste received by waste management facilities in Norfolk have nearly quartered since 2009. Increasing segregation of hazardous components within waste, increases in product lifespan, and technological change have contributed to these reductions. This trend is expected to continue through the Plan period. Due to the specialised nature of the management of hazardous waste, there is the potential that as the volumes of waste fall commercial viability may mean that this waste will be dealt with by a decreasing number of facilities nationally. In this scenario, waste operators may either leave the industry, or they may diversify their facilities to deal with other waste streams potentially increasing the capacity for these other wastes.

The following table shows the projection for hazardous waste tonnages through the Plan period, using the time series data to forecast a reduction of 6.6% per annum in hazardous waste arisings in Norfolk. The tonnage of hazardous waste received at waste management facilities in Norfolk for 2016 was just under 65,000 tonnes. While the amount in 2017 reduced to just over 36,000 tonnes, this is a very significant fall, however, due to the small volumes, it could be an aberrant year, so the forecast will not be changed in this assessment but will be reviewed in future iterations of this assessment. This approach also takes into account the additional volumes of hazardous waste which may be directly exported.

Table 22: Hazardous waste growth forecast to 2036

Year	**2015/16**	**2016/17**	**2017/18**	**2018/19**	**2019/20**	**2020/21**	**2021/22**
Haz	64,845	60,543	56,528	52,778	49,277	46,009	42,957
Year	**2022/23**	**2023/24**	**2024/25**	**2025/26**	**2026/27**	**2027/28**	**2028/29**
Haz	40,108	37,448	34,964	32,645	30,479	28,458	26,570
Year	**2029/30**	**2030/31**	**2031/32**	**2032/33**	**2033/34**	**2034/35**	**2035/36**
Haz	24,808	23,162	21,626	20,191	18,852	17,602	16,435

4.9 Radioactive waste

No radioactive waste is recorded as having been received or removed from waste management facilities in Norfolk, as the volumes produced by any one site are sufficiently low as to be exempt from reporting. Government published a 'Strategy for the management of solid low level radioactive waste from the non-nuclear industry in the United Kingdom' (2012) this contains guidance on the management of low level and very low level radioactive waste.

Very Low Level radioactive Waste (VLLW) is classified as non-nuclear waste if it is produced from educational and medical institutions. There are 12 organisations or institutions which have been granted a radioactive substances permit in Norfolk, this allows them to have a radioactive source, the use of such sources may give rise to the creation of VLLW, such as gowns and dressings which have been exposed to the radioactive source. This waste is normally produced in very small volumes by such establishments and does not require specialist facilities at a Waste Planning Authority level. Low volume VLLW is classified as less than 50m^3 per annum from any one site and can be managed at non-hazardous landfills and incinerators without special provisions. Low volume VLLW will be included within the general Household, Industrial and Commercial waste volumes and will be dealt with as such.

4.10 Agricultural waste

Agriculture produces significant amounts of waste if manures and slurries are included. Much of the animal waste produced on agricultural holdings is dealt with on such holdings either through traditional muck-spreading or following on-farm anaerobic digestion by spreading of digestate to land, in both cases as an agricultural land improver. As the inputs and outputs of such operations are often entirely contained within the farm unit, the waste does not often appear within the Waste Data Interrogator. Some waste from food production may leave the farm unit but is not managed at a facility classified as a waste management site. This is the case with the spent chicken litter consumed at the Thetford Power Station. On-farm anaerobic digestion plants are likely to either import or grow material to be blended with animal wastes to create a suitable feedstock. Agricultural operations also produce waste plastics, waste oils, chemicals and metals which are dealt with by waste management facilities. It is considered that this situation is likely to continue and does not require special provisions within the Plan. Agricultural waste that is managed off-site will be included within the general Household, Industrial and Commercial waste volumes and will be dealt with as such.

4.11 Total Forecast waste arisings in Norfolk from 2016/17 to 2035/36

The forecast waste arisings for LACW, C&I waste, inert waste and hazardous waste are all included in the table below:

Table 23: Forecast waste arisings in Norfolk from 2016/17 to 2035/36

Year	Local Authority Collected Waste	Commercial and industrial waste	Inert waste	Hazardous waste	Total Forecast waste arisings
2016/17	412,135	1,074,340	1,110,000	60,543	2,657,018
2017/18	415,927	1,090,777	1,110,000	56,528	2,673,232
2018/19	419,720	1,107,466	1,110,000	52,778	2,689,964
2019/20	423,512	1,124,410	1,110,000	49,277	2,707,199
2020/21	427,304	1,141,614	1,110,000	46,009	2,724,927
2021/22	431,097	1,159,081	1,110,000	42,957	2,743,135
2022/23	434,889	1,176,814	1,110,000	40,108	2,761,811
2023/24	438,682	1,194,820	1,110,000	37,448	2,780,950
2024/25	442,474	1,213,100	1,110,000	34,964	2,800,538
2025/26	446,267	1,231,661	1,110,000	32,645	2,820,573
2026/27	450,059	1,250,505	1,110,000	30,479	2,841,043
2027/28	453,852	1,269,638	1,110,000	28,458	2,861,948
2028/29	457,644	1,289,064	1,110,000	26,570	2,885,740
2029/30	461,437	1,308,786	1,110,000	24,808	2,905,031
2030/31	465,229	1,328,811	1,110,000	23,162	2,927,202
2031/32	469,021	1,349,141	1,110,000	21,626	2,949,788
2032/33	472,814	1,390,741	1,110,000	20,191	2,993,746
2033/34	473,606	1,412,019	1,110,000	18,852	3,014,477
2034/35	480,399	1,433,623	1,110,000	17,602	3,041,624
2035/36	484,191	1,455,558	1,110,000	16,435	3,066,184

5. Conclusion

5.1 Forecast waste arisings

The growth forecast for Local Authority Collected Waste (LACW) equates to a growth of just under 1% per annum over the Plan Period, from 412,135 tonnes in 2016/17 up to 484,200 tonnes in 2035/36.

Estimates for the growth of Commercial and Industrial (C&I) waste is based on the Gross Value Added (GVA) economic forecasts derived from the East of England Forecasting Model. The selected business sectors used are consistent with those used in the historic Defra surveys of C&I waste. The annualised growth percentage is approximately 1.5% for Norfolk compared with the 0.6% for England based on the latest Defra estimates for C&I growth. Therefore C&I waste arisings are forecast to increase from 1,074,340 tonnes in 2016/17 up to 1,455,558 tonnes in 2035/36. In 2017, an error was made by an operator which recorded an additional 114,620 tonnes of site waste water which should not have been recorded within the WDI (because it was discharged to ground and did not leave the site). If this water is not included as a waste in subsequent years, the forecast arisings will need to be reduced by approximately 115,000 tonnes.

Arisings of inert waste are assumed to remain constant over the Plan period at 1,110,000 tonnes per annum.

Based on time-series data, Norfolk's hazardous waste arisings are forecast to decrease by 6.6% per annum over the Plan period, from 64,800 tonnes in 2015/16 down to nearly 16,400 tonnes in 2035/36. The figure recorded on the WDI for 2016/17 showed a significant reduction to just over 36,000 tonnes. It has been concluded that due to potential for this to be an aberrant figure no change to the forecast will be made in this assessment. These figures will be monitored and if this significant reduction continues, a re-assessment will take place in future iterations of this report.

LACW, C&I waste, inert waste and hazardous waste quantities are forecast to reach approximately 3.06 million tonnes per annum by the end of the Plan period (see Table 23).

5.2 Existing waste management capacity

The assessment of existing waste management capacity concluded that a capacity of approximately 2.68 million tonnes per annum exists in Norfolk at the current time, based on historical throughputs of waste managed and recorded on waste surveys to Norfolk County Council, plus 735,000 tonnes of sewage sludge treatment capacity. The potential exists that, while this figure is calculated based on the maximum amount that facilities have managed, this may not represent the absolute maximum as some sites may have additional headroom to deal with even more waste if it were available to them.

In addition to the 2.68 million tonnes per annum capacity at existing facilities, Norfolk also has a number of mineral extraction sites using imported inert material and it is considered that these sites will meet the capacity requirements for the inert waste arisings that are unsuitable for recycling, over the Plan period. There is currently 2.68 million tonnes of permitted inert landfill and quarry restoration void space. Norfolk also has two non-hazardous waste landfill sites that are not currently receiving waste but have a remaining void capacity of 5.09 million cubic metres. Therefore, it is considered that sufficient capacity currently exists to meet the growth forecast. A planning application is currently being determined to change the waste type for the majority of one landfill site, from non-hazardous to inert. If granted, this permission would reduce the amount of non-hazardous void space in Norfolk to 1.53 million cubic metres and increase the amount of inert landfill void space by 2.23 million cubic metres (3.33 million tonnes).

In 2017, **hazardous waste** treated at facilities in Norfolk mainly consisted of WEEE, ELV, florescent tubes and liquid wastes. Hazardous waste arising in Norfolk that was treated at waste management facilities located outside Norfolk mainly consisted of WEEE, ELV, batteries, oil, asbestos-containing-materials and contaminated soils. As Norfolk has no hazardous waste landfill capacity, due to the underlying geology being generally incompatible

with such disposal, a significant part of the residual hazardous waste in Norfolk is ultimately received at the hazardous waste treatment facility and landfill at King's Cliffe in Northamptonshire.

Significant amounts of **inert waste** are recycled and reused as secondary aggregate as a substitute for primary materials. Inert waste recycling occurs both on construction sites and at specialist facilities often attached to mineral workings. There are no robust figures for inert waste recycling, because much of the recycling on construction sites is not recorded through the WDI as it never leaves the site to go to a waste management facility. Materials such as waste soils and silts (known as fines) are not normally capable of being used as substitute aggregates. However, fines are often used as remediation materials in the restoration of mineral workings. As there will be a continued demand for primary aggregate in Norfolk for the Plan period, there will be continued opportunities for inert material; which cannot be reused as secondary aggregate; to be used in remediation and recovery operations at mineral workings.

There are a number of treatment facilities for **sewage sludge** and wastes such as landfill leachate which operate at Water Recycling Centres in Norfolk. These facilities receive significant quantities of such waste from Norfolk and the neighbouring counties. Not all of these sites or all of the operations are included within the waste survey conducted by Norfolk County Council. In 2017 approximately 735,000 tonnes of waste were received at these facilities not subject to the waste survey, with two-thirds of this waste being received from neighbouring counties. This information is contained within the WDI. This represents a significant amount of existing capacity for wastewater treatment within Norfolk.

Agricultural waste is often dealt with on a farming unit, although there are some facilities which use agricultural waste as a feedstock. The largest of these facilities is the Thetford Power Station which consumes nearly 500,000 tonnes of chicken litter per annum, this is classified as a power station rather than a waste management facility and therefore does not submit either a waste survey return to Norfolk County Council or a return to the Environment Agency within the Waste Data Interrogator.

Norfolk does not have any final treatment or recovery facilities **for residual LACW or C&I** waste. Norfolk does have a significant amount of landfill void space in two permitted sites, however the economics dictate that these are not the most viable option for such waste at the present time as they are not currently operational. Significant amounts of residual LACW and C&I waste are therefore either taken directly to Energy from Waste facilities (incinerators) or are processed into Refuse Derived Fuel (RDF), which is subsequently transported to more distant EfW facilities.

National policy is clear that waste for disposal should go to the nearest appropriate facility, and the recovery of mixed municipal waste collected from private households should take place at the nearest appropriate facility. There is greater flexibility over where the recovery and recycling of other types of waste can take place. Operational thresholds may mean that not every Waste Planning Authority or EU member state requires the full range of waste management facilities; the nearest appropriate facility may be outside an administrative boundary. Therefore, the nearest appropriate facility for the disposal of Norfolk's residual waste is likely to be located outside of Norfolk, whilst the nearest appropriate facility for the recovery of LACW is likely to be located outside Norfolk and may be located outside the UK.

The National Planning Policy for Waste states that sites or areas for new or enhanced waste management facilities should "give priority to the re-use of previously development land, sites identified for employment uses and redundant agricultural and forestry buildings and their curtilages".

Changes in the regulatory and economic environment can have significant effects on the types of waste management operations which operators bring forward; therefore, flexibility in this regard will allow a degree of future proofing for the Plan. A waste operator will often only consider what might be an appropriate location for a waste management facility as part of the negotiations for a waste contract; rather than finding a location and then seeking to gain a contract for managing waste at that site.

The waste management industry operates in the same way as other contract driven industries, and it is part of the normal business cycle that some businesses will cease operation over the Plan period to be replaced by others; or businesses will move to gain competitive advantage and/or harness greater efficiencies. It is considered that the best way of planning for such eventualities is to provide a degree of flexibility, both in potential locations and potential waste management technologies so as to not stifle competition and innovation.

Glossary

Agricultural waste: Waste that is specifically generated by agricultural activities. This includes manure and other wastes from farms, poultry houses and slaughter houses; harvest waste and pesticides.

Anaerobic Digestion: Anaerobic digestion is the biological treatment of biodegradable organic waste in the absence of oxygen, utilising microbial activity to break down the waste in a controlled environment. Anaerobic digestion results in the generation of:
● Biogas, which is rich in methane and can be used to generate heat and/or electricity;
● Fibre, (or digestate) which is nutrient rich and can potentially be used as a soil conditioner; and
● Liquor, which can potentially be used as a liquid fertiliser.

Chemical Treatment: A method of treating waste that uses chemicals to treat waste to neutralise or reduce its harmfulness, prior to further treatment, recovery or disposal. These methods are often used to treat Hazardous Wastes (see separate definition) but chemical treatments are also applied in waste water treatment.

Composting: A method of biological treatment that involves breaking down organic waste into a soil-like substance, using various micro-organisms in the presence of oxygen. Can be done in “open windrows” or “in-vessel”. The end-product is compost which has various horticultural and agricultural uses. As there are potential risks to health from “bio-aerosols” and in some cases, animal by-products, composting is normally only allowed on sites that are an appropriate distance away from away from “sensitive receptors” such as housing and community facilities.

Commercial and industrial waste (C&I): Waste from shops, industrial and business premises.

Construction, Demolition and Excavation waste (CD&E): CD&E waste can be in the form of certain types of: Construction wastes (e.g. surplus supplies of materials specifically required for a single project as well as waste originating from site preparation), Demolition wastes (e.g. used material resulting from demolition activities); or Excavation wastes (e.g. usually consisting of soils and stones which cannot be used beneficially, such as from tunnelling operations, the soil component may not be inert).

Energy from Waste (EfW): Utilising the embodied energy of waste materials to generate electricity and heat through direct combustion or indirect combustion of biogas.

Energy recovery: The generation of heat and power from the thermal treatment of waste, the production of fuels from other forms of treatment and the combustion of landfill gas and gas from anaerobic digestion to create electricity.

Gross Value Added (GVA): the value generated by any business or organisation that produces goods or services. The calculation for GVA is: value of goods and services produced, minus the costs of production in terms of raw materials and other direct costs. It does not take into account the effects of taxation or subsidies. This can be measured across a geographical area, industry or sector, and can used as a measure of productivity and growth.

Hazardous waste: Defined in Article 2 (2) of the Waste Framework Directive (2008/98/EC) as “...waste which displays one or more of the hazardous properties listed in Annex III.” In other words, waste whose properties are likely to cause risks to health, the environment or water quality. Annex III of the Directive provides a (non-definitive) list of properties that render waste “hazardous,” and the Environment Agency has produced guidance on the types of waste that are likely to be hazardous.

Household, Industrial and Commercial waste (HIC): Household, industrial and commercial wastes, the deposition, recovery and disposal of which are subject to the licensing system established through the Environmental Protection Act (1990). There are exemptions from the requirement for a licence (e.g. individuals depositing personal garden waste), and these are detailed in the Controlled Waste Regulations (1992).

Household waste Household waste includes all mixed waste that is collected from households; all materials taken to local bring banks or collected at the doorstep or kerbside for recycling and composting; all waste (apart from rubble) that is taken to the County Council operated Recycling Centres; litter and street sweepings.

Household waste recycling centres: Provided by Waste Disposal Authorities as places where the public can deliver their household waste for recycling or disposal. These sites usually incorporate skips, collection areas for waste refrigeration and metal appliances, and recycling banks. Some sites have containers for materials such as waste batteries, paint, oil and wood. These facilities do not generally accept trade waste. **Incinerator:** The combustion of waste, either with or without energy recovery. Municipal energy from waste plants tend to be referred to as “incinerators” although they normally recover some energy, and the most recently developed plants (such as the facility at Great Blakenham in Suffolk, which is used by Norfolk County Council) are efficient enough to qualify as a waste “recovery” operation.

Inert waste: Waste that does not undergo any significant physical, biological or chemical changes likely to cause risks to health or to the environment or to affect water quality – the legal definition of “inert waste” can be found in Article 2 of the Landfill Directive (1991/31/EC). This type of waste can be disposed of at any permitted Landfill site. Certain types of inert waste such as clean waste soils may also be disposed of onto land for the legitimate purpose of restoration, land remediation or landscaping.

Knacker’s Yard: A facility for the disposal of dead animals, or the slaughter of old or injured animals (esp. horses) which are not suitable for human consumption, and whose remains are generally either incinerated or rendered depending on the facility.

Landfill: The term landfill relates to waste disposal mainly below ground level whereas landraise, also generically referred to as landfill, refers to waste disposal mainly above pre-existing ground levels. Modern landfill practice requires a significant degree of engineering in order to contain the waste, control emissions and minimise potential environmental effects. The primary by-products of landfilling, where biodegradable materials are disposed of, are landfill gas and leachate (a liquor resulting from water passing through the waste mass) and much landfill engineering is geared towards dealing with these substances. As such, landfill sites require containment lining systems and abstraction systems for both landfill gas and leachate.

Materials Recycling Facility (MRF): A facility for sorting, separating and packing or baling recyclable materials into individual materials prior to reprocessors who wash and prepare the materials for manufacturing into new recycled products. MRFs can also be referred to as materials recovery or reclamation facilities.

Mechanical Biological Treatment Facility (MBT): A facility containing a hybrid treatment process that uses both mechanical and biological techniques to sort and separate mixed waste. There is often an initial mechanical sorting and separation stage to recover materials suitable for recycling, followed by processing and/ or treatment of the residue, to prepare it for a final treatment stage, when any remaining residual waste is used to recover energy and/ or prepared for disposal. In this combination the final stage involves some form of biological treatment.

Recovery: Includes recycling and composting operations as well as anaerobic digestion, thermal treatment operations which produce energy from waste (including fuel, heat and power) and some backfilling operations.

Recycling: Defined in Article 3 (17) of the Waste Framework Directive (2008/98/EC) as “...any recovery operation by which waste materials are reprocessed into products, materials or substances whether for the original or other purposes. It includes the reprocessing of organic material but does not include energy recovery and the reprocessing into materials that are to be used as fuels or for backfilling operations.”

Refuse Derived Fuel (RDF): consists of the residual waste that complies with the specifications in a written contract between the producer of the RDF and a permitted end-user for the thermal treatment of the waste in an energy from waste facility or a facility undertaking

co-incineration such as cement and lime kilns. The written contract must include the end-user's technical specifications relating as a minimum to the calorific value, the moisture content, the form and quantity of the RDF.

Residual waste: The elements of the waste streams that remain following recovery, recycling or composting operations.

Transfer facility: A facility where waste materials are transferred from small vehicles to large trucks to be bulked up for efficient transport to treatment or disposal sites over a large distance.

Transfer/treatment: A facility where a degree of sorting and segregation of waste materials takes place from mixed loads of waste, such as skips, prior to waste being bulked up for efficient transport to further treatment or disposal sites over a large distance. A site may also carry out the recycling of construction waste such as rubble into secondary aggregate.

Waste arisings: The amount of waste generated in any given locality over a given period of time.

Waste Collection Authority: A local authority with a statutory responsibility to provide a waste collection service to each household in its area, and on request, to local businesses; in Norfolk the relevant district, borough or city council is the WCA.

Waste Disposal Authority: A local authority that is legally responsible for the safe disposal of municipal waste collected by the WCAs and the provision of Household Waste Recycling Centres; in Norfolk the County Council is the WDA.

Waste Planning Authority: An organisation with statutory planning powers relating to waste management development, in most areas the County or Unitary Council

Appendix 1 - Waste facilities over 20,000 tonnes per annum in Norfolk 2012-2016

Site name	Address	Postcode	Operator	Temporary/ Permanent permission	End date	Site Type
Methwold	Methwold Farm, Methwold, Thetford	IP26 4DU	EFFG Woodlark	Permanent	N/A	Anaerobic Digestion
Whitlingham Sewage Treatment Works	Whitlingham Sewage Treatment Works, Kirby Bedon Road, Trowse	NR14 7DU	Anglian Water Plc	Permanent	N/A	Composting
Wissington Sugar Factory	College Road, Stoke Ferry, King's Lynn	PE33 9QG	British Sugar PLC	Temporary	26/09/2018	Composting
Weston Longville	The Runway, Woodforde Farm, Weston Longville	NR9 5LG	TMA Bark Supplies	Permanent	N/A	Composting
South Wootton	Estuary Farm, Edward Benefer Way, King's Lynn	PE30 2HY	Greenworld Sales Ltd	Temporary	19/08/2030	Composting
Marsham	Wood Farm, Buxton Road, Marsham	NR10 5QQ	News Ltd	Permanent	N/A	Composting
Thurlton	Crossways Waste Management Facility, Thurlton	NR14 6NZ	M Gaze & Co Ltd	Permanent	N/A	Composting
Carleton Rode	Double Banks Farm, Abbey Road, Carleton Rode	NR16 1NH	None	Permanent	N/A	Composting
Bracon Ash	Old Hethel Airfield, Stanfield Road, Wymondham	NR18 9RL	Greencomp	Permanent	N/A	Composting
Caister on Sea	Pump Lane, Caister on Sea, Great Yarmouth	NR30 5BE	Norfolk County Council	Permanent	N/A	HWRC
Norwich	Swanton Road, Norwich	NR2 4LH	FCC Environment(UK)Ltd	Permanent	N/A	HWRC
King's Lynn	Willows Business Park, Saddlebow, King's Lynn	PE34 3RD	Norse Ltd	Permanent	N/A	HWRC
Middleton	Blackborough End Landfill, East Winch Road, Mill Drove	PE32 1SW	Middleton Aggregates Ltd	Temporary	23/01/2021	Inert Landfill

Site name	Address	Postcode	Operator	Temporary/ Permanent permission	End date	Site Type
Middleton	Blackborough End Landfill, East Winch Road, MIll Drove, Blackborough End	PE32 1SW	Middleton Aggregates Ltd	Temporary	23/01/2021	Inert Landfill
Ketteringham-Middleton Aggregates	Former Ketteringham Quarry, Hethersett Road, Ketteringham	NR14 8JA	Middleton Aggregates Ltd	Temporary	31/05/2029	Inert Landfill
Cantley	Land at Cantley Sugar Factory	NR13 3ST	British Sugar PLC	Temporary	31/01/2022	Inert Landfill
Morningthorpe	Morningthorpe Quarry, Mill Rd, Morningthorpe	NR15 2LJ	Richardson Recycling Ltd	Temporary	18/03/2023	Inert Landfill
Beeston Regis Quarry	Beeston Regis Quarry, Briton's Lane, Beeston Regis, Sheringham	NR26 8TP	Carter Concrete Ltd	Temporary	22/02/2042	Inert recycling
Glaven Pits	Wall's Lane Quarry, Wall's Lane, Lethingsett	NR25 7JN	Glaven Pits Ltd	Permanent	N/A (CLU)	Inert recycling
Bittering Quarry	Bittering Quarry, Reed Lane, Bittering, East Dereham	NR19 2QS	McLeod Aggregates Ltd	Temporary	31/12/2031	Inert recycling
Crimplesham Quarry	Crimplesham Quarry, Main Road, Crimplesham	PE33 9EB	Frimstone Ltd	Temporary	31/12/2018	Inert recycling
Snettisham Quarry	Snettisham Quarry, Norton Hill, Snettisham, King's Lynn	PE31 7LZ	Frimstone Ltd	Temporary	04/09/2028	Inert recycling
Crimplesham Quarry	Crimplesham Quarry, Main Road, Crimplesham	PE33 9EB	Frimstone Ltd	Temporary	31/12/2027	Inert recycling
West Caister	Pump Lane, Caister on Sea, Great Yarmouth	NR30 5TE	Carters of Caister	Permanent	Not yet implemented expiry 30/06/2019	Inert recycling
Great Yarmouth-EE Green	Harfrey's Road, Harfrey's Industrial Estate, Great Yarmouth	NR31 0LN	E E Green & Son	Permanent	N/A	Inert recycling
Stow Bedon	Lodge Farm, Thetford Road, Breckles, Attleborough	NR17 1ES	R Childerhouse	Permanent	N/A	Inert recycling
Aylsham Industrial Estate	Aylsham Industrial Estate, Banningham Road,Aylsham	NR11 6SS	Aylsham Plant Hire Ltd	Permanent	N/A(CLU)	Inert recycling

Site name	Address	Postcode	Operator	Temporary/ Permanent permission	End date	Site Type
Burgh Castle	Welcome Pit, Butt Lane, Burgh Castle, Great Yarmouth	NR31 9PY	Folkes Plant & Aggregates Ltd	Permanent	N/A	Inert recycling
Carbrooke Quarry	Carbrooke Quarry, Summer Lane, Carbrooke	IP25 6TR	Frimstone Ltd	Temporary	11/02/2025	Inert recycling
Browston Green	Cherry Lane, Browston Green	NR31 9DN	E E Green & Son	Permanent	N/A (CLU)	Inert recycling
Melton Constable	Land off Marriott Way, Melton Constable Industrial Estate, Briston	NR24 2BT	Morrissey Builders Ltd	Permanent	N/A	Inert recycling
Holt	Ducks Hole Farm, Hunworth Road, Holt	NR25 6SR	Cemex UK Ltd	Temporary	29/07/2030	Inert recycling
Mayton Wood Quarry	Mayton Wood Quarry, Little Hautbois, Coltishall, Norwich	NR12 7JX	Frimstone Ltd	Temporary	23/04/2020	Inert recycling
Bawsey	Innisfree Trading Estate, Lynn Road, Bawsey, King's Lynn	PE32 1EX	P Bacon Recycling Ltd	Permanent	N/A	Metal recycling
Lenwade (Morton on the Hill)	Atlas Works, Norwich Road, Lenwade	NR9 5AW	European Metal Recycling Ltd	Permanent	N/A	Metal recycling
Great Yarmouth (South Quay)	South Quay, Great Yarmouth	NR30 3LD	European Metal Recycling Ltd	Permanent	N/A	Metal recycling
Costessey	Longwater Estate, Costessey, Norwich	NR5 0TL	None	Permanent	N/A	Metal recycling
Middleton	Blackborough End Landfill, East Winch Road	PE32 1SW	FCC Environment(UK) Ltd	Temporary	31/12/2026	Non-Haz landfill
Feltwell B	Feltwell Quarry, The Oakery, Lodge Road, Feltwell	IP26 4DR	Frimstone Ltd and FCC Environmental (UK) Ltd	Temporary	22/02/2042	Non-Haz landfill
Attlebridge	Attlebridge Landfill Site, Reepham Road, Attlebridge, Norwich	NR9 5TD	Biffa Waste Services	Temporary	09/11/2021 (now closed)	Non-Haz landfill
Wereham	Cornerway Farm, College Road, Stoke Ferry	PE33 9AZ	British Sugar PLC	Temporary	29/04/2025	Soil recycling

Site name	Address	Postcode	Operator	Temporary/ Permanent permission	End date	Site Type
Shipdham	Site No.3, Shipdham Airfield Industrial Estate, Shipdham	IP25 7SD	FCC Environment(UK) Ltd	Permanent	N/A	Transfer
Roundham	Muck Pad, Bridgham Road, Camp Farm, Bridgham	NR16 2RX	Fibrophos Ltd	Permanent	N/A	Transfer
Great Yarmouth-Enviroco Ltd	1-4 South Denes Road, Great Yarmouth	NR30 3QF	Enviroco Ltd	Permanent	N/A	Transfer
Thetford Power Station	Mundford Road, Two Mile Bottom, Thetford	IP24 1LX	Fibrophos Ltd	Permanent	N/A	Transfer
Rossfield-Reepham Road	Rossfield, Reepham Road, Horsford, Norwich	NR10 3AL	M & C Skip Hire and AKS	Permanent	N/A	Transfer/Treat
West Caister	Pump Lane, Caister on Sea, Great Yarmouth	NR30 5TE	Norfolk County Council	Permanent	N/A	Transfer/Treat
Ketteringham-MW White	Station Road, Ketteringham	NR9 3AZ	M W White Ltd	Permanent	N/A	Transfer/Treat
Great Yarmouth-East Coast Waste Ltd	Harfrey's Road, Harfrey's Industrial Estate, Great Yarmouth	NR31 0LS	East Coast Waste Recycling	Permanent	N/A	Transfer/Treat
North Walsham	4 Folgate Road, Lyngate Industrial Estate, North Walsham	NR28 0AJ	Mr M Drury	Permanent	N/A	Transfer/Treat
Rackheath	Unit 5,Wendover Road, Rackheath, Norwich	NR13 6LH	Parker Skip Hire	Permanent	N/A	Transfer/Treat
Tivetshall St Margaret	Station Road, Tivetshall St Margaret, Norwich	NR15 2BA	FCC Environment(UK) Ltd	Permanent	N/A	Transfer/Treat
Frans Green	Frans Green Industrial Estate, Sandy Lane, East Tuddenham, Dereham	NR20 3JG	Pips Skips	Permanent	N/A	Transfer/Treat
Frans Green-Pips Skips Ltd	Frans Green Industrial Estate, Sandy Lane, East Tuddenham	NR20 3JG	Pips Skips	Permanent	N/A	Transfer/Treat
Great Yarmouth-MT Skips	East Coast Waste Ltd, Eurocentre, North River Road, Great Yarmouth	NR30 1TE	East Coast Waste Ltd	Permanent	N/A	Transfer/Treat
Yew Tree Farm - Pulham Market	Yew Tree Farm, Tivetshall Road, Pulham Market	IP21 4XN	AR Kent & Son	Permanent	N/A	Transfer/Treat

Site name	Address	Postcode	Operator	Temporary/ Permanent permission	End date	Site Type
West Dereham	Glazewing House, Station Road, West Dereham	PE33 9RR	Glazewing Ltd	Permanent	N/A	Transfer/Treat
Thetford A	3-5 Howlett Way, Thetford	IP24 3RW	Viridor Ltd	Temporary	14/08/2020	Transfer/Treat
Costessey	Longwater Estate, Costessey, Norwich	NR5 0TL	NEWS Ltd	Permanent	N/A	Transfer/Treat
Unit 6 Dunkirk Ind Estate	Unit 6, Dunkirk Industrial Estate, Aylsham	NR11 6SS	NEWS Ltd	Permanent	N/A	Transfer/Treat
Costessey	Longwater Business Park, Costessey, Norwich	NR5 0TL	FCC Environment(UK) Ltd	Permanent	N/A	Transfer/Treat
Hall Drive	Hall Drive, Longwater Lane, Costessey	NR5 0TG	Jays Total Waste Management Ltd	Permanent	CLU	Transfer/Treat
Frans Green-Norman Wenn Ltd	Unit 2, Frans Green Industrial Estate, Sandy Lane, East Tuddenham	NR20 3JG	Norman Wenn Skip Hire	Permanent	N/A	Transfer/Treat
King's Lynn	King's Lynn Resource Management Centre, Hardwick Narrows Industrial Estate, Hamlin Way, King's Lynn	PE30 4NG	NEWS Ltd	Permanent	N/A	Transfer/Treat
Great Yarmouth-Folkes Plant	Harfrey's Road, Harfrey's Industrial Estate, Great Yarmouth	NR31 0LS	Folkes Plant & Aggregates Ltd	Permanent	N/A	Transfer/Treat
Worstead	Boundary Pit, Sandhills Lane, Old Yarmouth Road, North Walsham	NR28 9NA	C Bird	Permanent	N/A	Transfer/Treat
Worstead	Boundary Pit, Sandhills Lane,Old Yarmouth Road,North Walsham	NR28 9NA	C Bird	Permanent	N/A	Transfer/Treat
East Wretham	Larkshall MIll, Thetford Road, East Wretham	IP24 1QY	Viridor Ltd	Permanent	N/A	Transfer/Treat
Hockwold-cum-Wilton	Freedom Farm, Cowles Drove,Hockwold,Thetford	IP26 4JQ	Freedom Recycling Ltd	Permanent	N/A	Transfer/Treat
Thurlton	Crossways Waste Management Facility,Thurlton	NR14 6NZ	M Gaze & Co Ltd	Permanent	N/A	Treatment/ Disposal

Appendix 2

Waste facilities under 20,000 tonnes per annum in Norfolk 2012-2016 (with planning permission granted by Norfolk County Council)

Site Name	Address	Post code	Operator	Temporary/ Permanent permission	End date	Site Type
Loddon	Lodge Farm, Stubbs Green Lane, LODDON, Norfolk	NR14 6EA	Agri-Cycle Norfolk	Permanent	N/A	Agricultural waste collection/storage
Corpusty / Edgefield	Shrubbs Farm, Edgefield Road, Melton Constable, Norfolk	NR24 2AT	ORM North Norfolk	Permanent	N/A	Composting
Cranworth	Blackmoor lane, Shipdham, THETFORD, Norfolk		Mr Leonard	Permanent	N/A	Composting
Denton	Mill House, Darrow Green Road, HARLESTON	IP20 0BA	Denton Parish Council	Permanent	N/A	Composting
Geldeston	Land at Gillingham Road, Geldeston	NR34 0LN	Community Composting Site	Permanent	N/A	Composting
Trunch	Bidwells Farm, Blooms Turn, Trunch, Norfolk	NR28 0PQ	Trunch Parish Council	Permanent	N/A	Composting
Beeston Regis	Remembrance Gardens, Britons Lane, BEESTON REGIS	NR26 8TP	Abbey Pets			Incinerator
Potter Heigham	Red Roof Farm, Ludham Road, Potter Heigham	NR29 5NB	Playford, Mr G	Permanent	N/A	Incinerator
West Rudham	The Grange, West Rudham, KING'S LYNN	PE31 8SY	Peaceful Pets	Permanent	N/A	Incinerator
Felthorpe	Norfolk Pet Crematorium, Shortthorn Road, Felthorpe, Norwich	NR10 4DE	Norfolk Pet Crematorium Ltd	Permanent	N/A	Incinerator & Transfer Station

Site Name	Address	Post code	Operator	Temporary/ Permanent permission	End date	Site Type
Bergh Apton	Road Haulage Depot, Welbeck Road, BERGH APTON	NR15 1AU	T Farrow Construction	Permanent	N/A	Inert recycling
Hempton	Helhoughton Road, Hempton	NR21 7DY	Gamble Plant	Permanent	N/A	Inert recycling
Costessey	Longwater Industrial Estate, Dereham Road, Costessey, NORWICH	NR5 0JS	Longwater Gravel Ltd	Permanent	N/A	Inert recycling
Catfield	Stanton, Ludham Road, Catfield, Great Yarmouth	NR29 5PY	Bunting, Mr G	Permanent	N/A	Inert recycling
Beetley	East Bilney Quarry, Rawhall Lane, Beetley	NR20 4HH	Middleton Aggregates Ltd	Temporary	31/12/2029	Inert recycling
Mattishall	Kensington Forge, Mattishall, Dereham,Norfolk	NR20 3PD	Norfolk Wood	Permanent	N/A	Inert recycling
Costessey	Land N of Ernest Gage Way, Longwater Industrial Estate, Costessey, Norwich	NR5 0TX	DSP Supplies	Permanent	N/A	Inert recycling
Pott Row	Grove Lodge, Innisfree Trading Estate, Lynn Road, BAWSEY, King's Lynn	PE32 1EX	P Bacon	Permanent	N/A	Knackers Yard
Beeston Regis	Britons Lane, Beeston Regis, Sheringham	NR26 8TP	Carter Concrete	Permanent	Complete	Liquid Waste & Recycling
Thorpe Abbotts	Bardwell Hall, Bardwell, BURY ST EDMUNDS, Suffolk		Mr P Barty			Recycling
Hethersett	34A Mill Road, Hethersett, NORWICH, Norfolk	NR9 3DP	Mr M Spanton			Recycling
Heywood	Lodge House, Shelfhanger Road, Heywood, Diss, Norfolk	IP22 4EE	R & C Bettinson	Permanent	N/A	Recycling
Aylmerton	Hillside, Church Road, AYLMERTON	NR11 8PZ	Mr Rounce			Recycling
Attleborough	51 Maurice Gaymer Road, Gaymers Industrial Estate, ATTLEBOROUGH	NR17 2QZ	Recyclite Ltd	Permanent	N/A	Recycling Centre

Site Name	Address	Post code	Operator	Temporary/ Permanent permission	End date	Site Type
King's Lynn	King's Lynn Sewage Treatment Works, Clockcase Lane, Clenchwarton, KING'S LYNN	PE34 4BZ	Anglian Water Services Ltd	Permanent	N/A	Sewage Treatment Works
Gt Yarmouth	Bessemer Way, Harfrey's Road Industrial Estate, Great Yarmouth	NR31 0LX	Augean North Sea Services	Permanent	N/A	Transfer
Diss	Vince's Road, Diss, Norfolk	IP22 4YE	PHS Ltd	Permanent	N/A	Transfer
Great Yarmouth	Hendee House, Battery Road, Great Yarmouth	NR30 3NN	East Coast Insulations	Permanent	N/A	Transfer
Gt Yarmouth	Yarmouth Business Park, Suffolk Road, Great Yarmouth	NR31 0ER	C & L Waste Oil Collection			Transfer Station
King's Lynn	Unit 5/6 Hardwick Industrial Estate, Paxman Road	PE30 4NE	Cannon Hygiene Ltd	Permanent	N/A	Transfer Station
Tuddenham	Low Road farm, Low Road West, North Tuddenham, Dereham	NR20 3AB	North Tuddenham Parish Council	Permanent	N/A	Transfer Station
Westwick	2 Tollbar Cottages, Norwich Road, Westwick, NORTH WALSHAM	NR10 5BG	Dave's Skips	Permanent	N/A	Transfer/Treat
Walpole St Andrew	The Nursery, Marsh Road, Walpole St. Andrew, Wisbech	PE14 7HL	M & M Services	Permanent	N/A	Transfer/Treat
Norwich	Compound 1,Former Training Workshop, Swanton Road, NORWICH	NR2 4LH	Ace Waste Management	Permanent	N/A	Transfer/Treat
Whitlingham	Whitlingham Water Treatment Centre, Kirby Bedon Road, Trowse	NR14 8TZ	Alpheus Environmental Ltd	Permanent	N/A	Transfer/Treat
Outwell	Cecil House, Mullicourt Road, OUTWELL	PE14 8PX	Doubleday, Mr D B	Permanent	N/A	Transfer/Treat
Bradwell	Vanguard Road, Gapton Hall Ind. Est., BRADWELL, GT. YARMOUTH	NR31 0NT	D & J Metals	Permanent	N/A	Transfer/Treat
Costessey (LDC)	Hall Drive, Longwater Lane, Costessey	NR5 0TH	Frank Carrara	Permanent	N/A	Transfer/Treat

Site Name	Address	Post code	Operator	Temporary/ Permanent permission	End date	Site Type
Besthorpe	Walnut Tree Farm, Silver Street, BESTHORPE	NR17 2LF	Baldwin Skip Hire Ltd	Permanent	N/A	Transfer/Treat
Gt Yarmouth (Harfreys)	Harfreys Road, Harfreys Industrial estate, GREAT YARMOUTH	NR31 0LS	W T Waste	Permanent	N/A	Transfer/Treat
North Walsham	Fortune House, Laundry Loke Industrial Estate	NR28 0BD	Mr J Silk	Permanent	N/A	Transfer/Treat
Ashwellthorpe	Cats Premises, Ashwellthorpe Industrial Estate, ASHWELLTHORPE, NORFOLK	NR16 1ER	AC Environmental Services Ltd	Permanent	N/A	Transfer/Treat
Dereham South	Hall Lane, Greens Road Industrial Estate, DEREHAM, Norfolk	NR20 3TG	MPH Skip Hire	Permanent	N/A	Transfer/Treat
Whissonsett	Willow House, Dereham Road, Whissonsett, DEREHAM	NR20 5TQ	A E Daniels & Son	Permanent	N/A	Transfer/Treat
King's Lynn	Bartons Farm, St Johns Business Estate, Downham Market, KINGS LYNN, Norfolk	PE38 0QQ	Mr D Jones - Bartons Farm	Permanent	N/A	Transfer/Treat
Hockering	Frans Green Industrial Estate, Sandy Lane, East Tuddenham, DEREHAM	NR20 3JG	Pips Skips	Permanent	N/A	Transfer/Treat
Shropham	Hargham Road, Shropham, Norfolk	NR17 1DT	STP Recycling	Permanent	N/A	Transfer/Treat
N Walsham	17 Cornish Way, North Walsham, Norfolk	NR28 0AW	DLH Auto Recyclers	Permanent	N/A	Transfer/Treat
Bradenham	6 Gibbet Farm, Hale Road, Bradenham	IP25 7QX	J P Skip Hire	Permanent	N/A	Transfer/Treat
Norwich Airport	Liberator Road, Norwich Airport, NORWICH	NR6 6ER	KLM UK engineering	Permanent	N/A	Transfer/Treat
Norwich (Weston Road)	22a Weston Road, Norwich	NR3 3WG	Norse Commercial Services Ltd	Permanent	N/A	Transfer/Treat