West Berkshire Minerals and Waste Local Plan - Preferred Options
Local Waste Assessment, March 2017

West Berkshire Local Plan

West Berkshire Council

West Berkshire Local Waste Assessment.

West Berkshire Council

March 2017

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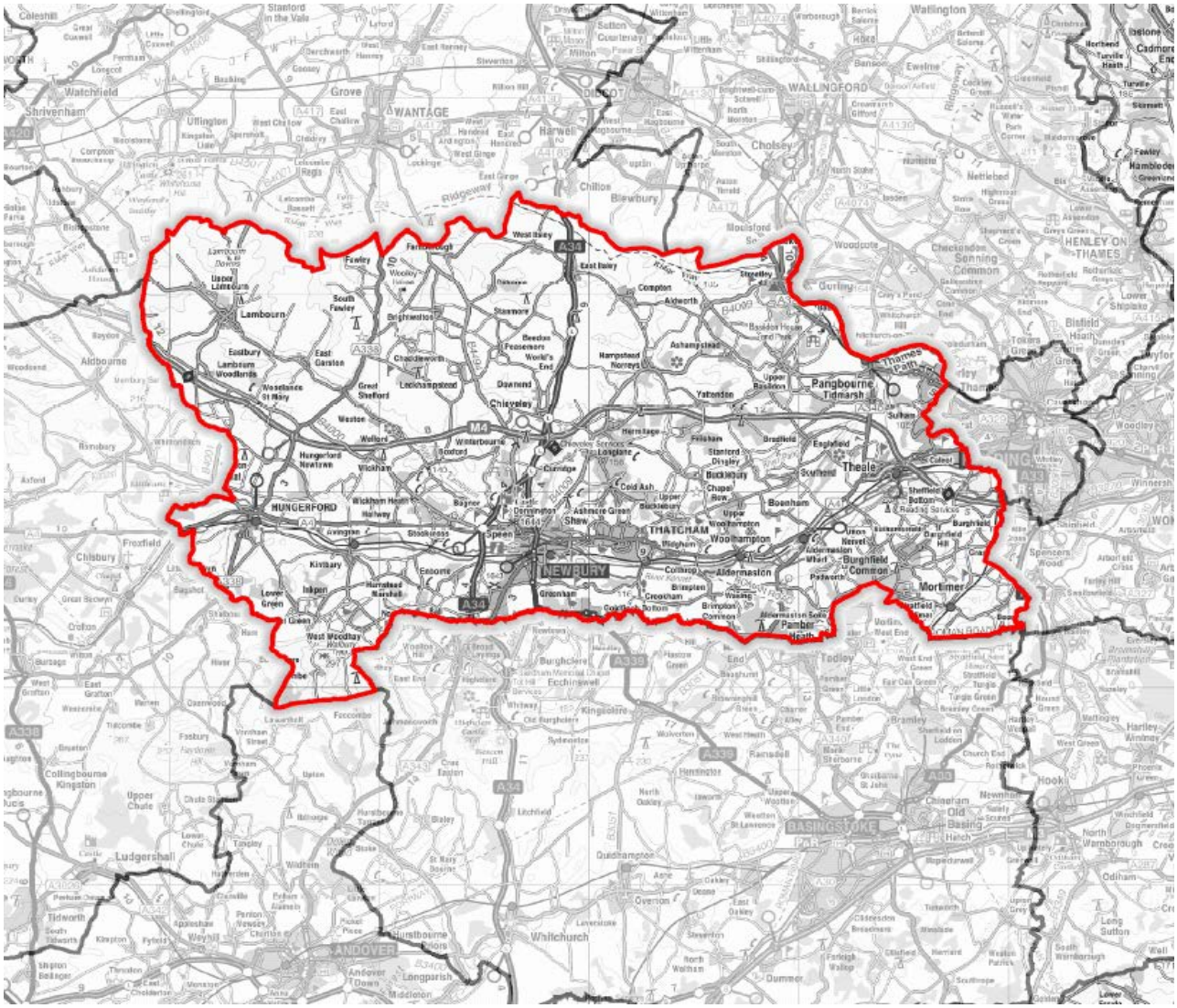


West Berkshire Authority Area

Contents

Tables, figures, graphs and maps

Appendices

Executive Summary

i. This Local Waste Assessment (LWA) has been produced as evidence for the development of the emerging Minerals and Waste Local Plan for West Berkshire. It assesses the current waste management capacity, current waste arisings, and available historic patterns of arisings in West Berkshire. Estimated projections have also been calculated for future arisings throughout the plan-period. Movement of waste across administrative boundaries has also been factored into the assessment. The three main waste streams that have been covered are:

- Local Authority Collected Waste (LACW)
- Commercial and industrial waste (C&I), and
- Construction, demolition and excavation waste (CDE)

ii. Alongside these three main waste streams this LWA also considers the situation around hazardous waste, radioactive waste, sewage sludge and equine waste.

iii. The following table provides a summary of the estimated waste management capacity available at existing sites in West Berkshire (in tonnes of capacity per year).

Table i Estimated waste management capacity

Facility type	Capacity in 2015 (tonnes)
Household Waste Recycling Centres	30,000
Biological treatment : thermal facilities, composting facilities, and sewage treatment	143,700
Recycling and Transfer facilities	914,180 (of which approximately 169,250 tonnes is transfer)
Specialist Treatment Sites	>39,998
Total	**1,127,878**
Total (excluding transfer)	**958,628**

iv. Table i above shows that the consented waste infrastructure in West Berkshire could manage over 1 million tonnes of waste arisings per year. However when the available transfer capacity is removed (on the assumption that waste transfer capacity does not actually 'manage' the waste and can potentially result in the double counting of waste inputs), then this capacity reduces to approximately 960,000 tonnes per annum.

v. In addition it is understood that in 2015 there was around 354,000m^3 of inert waste landfill capacity consented in West Berkshire (with 1.25 million m^3 having yet to be created through consented mineral extraction).

vi. A number of observations can be made about the existing waste management facilities in West Berkshire:

- West Berkshire has no hazardous landfill capacity.
- West Berkshire has no non-hazardous landfill capacity.
- West Berkshire has no low level or intermediate level radioactive waste disposal capacity.
- West Berkshire has very little waste recovery capacity (and the little that there is generates heat or electricity by burning wood waste).

Table ii Summary of arisings in base year and projected arisings at the end of the plan period

Waste Stream	Year of baseline arisings	Tonnage of current/baseline arisings per annum unless otherwise stated	Year of projected arisings (end of plan period)	Tonnage of projected arisings per annum unless otherwise stated
Local Authority Collected Waste (LACW)[1]	2015/16	86,399	2036/37	130,000[2]
Commercial and Industrial waste (C&I)	2016	285,696	2036	325,000
Construction, Demolition and Excavation waste (C,D&E)	2015	360,114	2036	360,114
Hazardous waste[3]	2015	15,392	2036	19,000
Radioactive waste[4]	2012/13	1,053 m^3	2036	309m^3
Sewage Sludge	*2011*	*3,809*	*2036*	*3,809*
Equine waste	2010	52,807	2036	52,807
Total[5]		**751,410**		**837,923**
		1,053 m^3		309m^3

[1] Local authority collected waste (LACW) represents all waste collected by the local authority. This is a slightly broader concept than Local Authority Collected Municipal Waste (LACMW) as it would include both this and non municipal fractions such as construction and demolition waste
[2] Considered to be absolute worst case scenario and going on trend data more likely to be 80,000 to 90,000 tonnes annually
[3] It is acknowledged that there is a high risk of double counting of the hazardous waste stream as in theory it should be picked up by the Commercial and Industrial waste modelling, however it has been included as a worst case scenario
[4] 2012 Quinquennial Review: Submission supporting the AWE Decommissioning Strategy, Atomic Weapons Establishment, December 2012 and the underpinning data
Please note that it is difficult to trace the consigned volume to the disposal volume. For example, AWE may consign an ISO freight container containing up to 72 drums of LLW to the LLW compactor operated on behalf of LLWR where the volume is reduced by a factor of 5. The compacted drums are then loaded into a disposal container [typically a half height ISO container] and grouted before placing in the LLWR vault. So for this reason the quantities stated should be treated with caution
[5] Totals do not include radioactive wastes or equine wastes

vii. Table ii above shows the current capacity of waste sites in West Berkshire broken down into 'facility type' and, as stated above, the total annual capacity excluding 'transfer' is **958,628** tonnes. When compared to the worst case projected total annual waste arisings for 2036 (the end of the plan period) of **837,923** tonnes, it can be seen that there is a difference, and hence headroom of **120,705** tonnes. It should be acknowledged that two of the sites providing CDE recycling capacity operate under temporary consents and together these two sites provide approximately 110,000 tonnes of waste management capacity. Therefore, when this is factored in, there is still headroom of **10,705** tonnes.

viii. In terms of waste movements, during 2013, 2014, and 2015 according to the Environment Agencies Waste Data Interrogator (WDI), there has been significantly more waste managed in West Berkshire than was recorded as arising there, the differences being 656,564 tonnes in 2013, 364,349 tonnes in 2014, and 329,104 tonnes in 2015 respectively. The weaknesses in WDI are acknowledged, however this is certainly indicative of the fact that facilities in West Berkshire manage waste for a wider area than just West Berkshire itself with potentially large volumes of waste flowing into West Berkshire for management.

ix. It is anticipated that the preferred minerals sites that the preferred options plan suggests should be allocated could require an additional 1,960,000m^3 of landfill capacity to ensure the restoration of these sites over the life of the plan. In terms of new sites for the management of waste, it is only intended to allocate sites for inert landfilling where this is necessary for the restoration of sites which are being allocated for mineral extraction. Therefore, at this point (preferred options consultation) no new waste facilities are being proposed for allocation in the emerging plan. This is partly due to the lack of need identified above and partly due to the lack of new waste management sites that were put forward by prospective operators during the call for sites excercise undertaken by the Council. Only 2 'new' waste sites were put forward for inclusion in the MWLP; one of these was withdrawn and one was not considered suitable for allocation.

x. Taking what is considered to be an absolute worst case scenario, overall there is headroom of approximately 10,705 tonnes at 2036, the end of the plan-period. This means that net self-sufficiency can be achieved in total tonnage terms when factoring all waste streams into the equation. It is acknowledged that waste travels across administrative boundaries, hence the term 'net self sufficiency', and it is considered that this approach is in the spirit of Article 16 of the Waste Framework Directive[6]: Principles of Proximity and Self-Sufficiency.

[6] http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32008L0098

1.0 Introduction

1.1 As part of the evidence that supported the Issues and Options Consultation on the emerging West Berkshire Minerals and Waste Local Plan (WBMWLP) the Council published a Local Waste Assessment (December 2013)[7]. Although the LWA 2013 remains part of the evidence base for the emerging plan, this document replaces the 2013 Local Waste Assessment (LWA 2013) and has been developed to support the "Preferred Options" stage of the plan making process.

1.2 The purpose of this local assessment is to build upon the LWA 2013 and provide a greater understanding of the level of need for the provision of waste management infrastructure and activities in the authority's area over the projected plan period.

1.3 Following the completion of the LWA 2013 the Council employed a consultancy, Beyond Waste, to review and critique the document and identify the areas where it was considered that additional evidence or work was required as well to assist in the identification of different, or more robust data sources and prediction methodologies.

1.4 The review of the LWA 2013 identified that the document that had been produced to support the issues and options consultation included a large volume of information on the context around each waste stream as well as providing an indication of the situation at a regional and national level before moving down to a local level. Whilst such an approach was recognised as being informative it was identified that such background information was likely to be superfluous for plan making in West Berkshire. In addition it is clear that the data within the LWA 2013 is now becoming dated and needs to be refreshed and updated to assist in supporting the ongoing development of the emerging WBMWLP.

West Berkshire Minerals and Waste Local Plan (WBMWLP)

1.5 The emerging West Berkshire Minerals and Waste Local Plan may include the allocation of preferred areas for waste management to ensure that West Berkshire can maintain a position of net self sufficiency in waste management terms. The principle of net self sufficiency would mean that the authority plans for the delivery of sufficient waste management facilities to ensure that the permitted level of waste management capacity exceeds the level of waste projected to arisings within the authority area over the Plan period[8].

1.6 The development of the WBMWLP, and allocation of sites as appropriate, is intended to ensure that waste management operations will be located on suitable sites when balanced against the wider sustainability and environmental objectives.

1.7 It is possible that planning applications for waste management development could come forward prior to adoption of the WBMWLP. In such instances, proposals will be tested against the development plan for West Berkshire that includes "saved" policies in the Waste Local Plan for Berkshire adopted in 1998 (WLPB). The NPPF, NPPW, and PPG, as well as other material considerations will also be relevant to decision making in the interim period and beyond.

1.8 It is well known that waste flows across authority boundaries and in this regard it is understood that West Berkshire has, historically, been a significant importer of some waste streams (notably inert construction and demolition waste). However, it is also acknowledged that West Berkshire also exports a significant amount of other waste types (notably municipal solid) for management outside the authority area.

1.9 West Berkshire is too small an area to plan effectively for all waste streams. This is primarily due to the level of waste arisings and issues around economies of scale and waste management contracts. Much of the specialist waste arisings in the district are too low to

[7] http://info.westberks.gov.uk/CHttpHandler.ashx?id=35870&p=0

[8] The Plan period, for the purposes of this LWA is the period to 2036.

make a specific waste treatment or disposal viable. This is probably true of all plan areas as all waste planning authorities will generate small volumes of very specialised waste, such as hazardous or radioactive waste, that it would be uneconomical to manage locally.

1.10 Therefore there will always be a movement of waste across administrative boundaries, however it is considered that by planning for net self sufficiency should mean that the authority is in the position where the level of waste movement necessary is reduced. It is accepted that West Berkshire will always be reliant on other local authorities to manage some waste arising within West Berkshire. This is because there is a distinct lack of non hazardous landfill capacity within the authority (primarily due to the geological make up of the authority) meaning that such wastes destined for landfill will have to be exported. Similarly there is only a small volume of waste recovery capacity in West Berkshire (there being a small number of facilities that use waste wood to generate electricity or produce heat and some on farm anaerobic digestion capacity). Again this means that waste materials destined for recovery will have to be exported for management outside the authority.

1.11 However it should be noted that these potential shortfalls in waste management capacity are at the lower end (or bottom in the case of landfill) of the waste hierarchy that is set out in National Planning Policy for Waste. As such the existing operating and permitted waste management facilities in West Berkshire are at the upper end of the waste hierarchy.

Purpose of the Local Waste Assessment

1.12 This Local Waste Assessment reports on and assesses the following matters:

- The current waste arisings in West Berkshire, as well as any historic patterns of arisings, covering each of the three main waste streams;
    - Local Authority Collected Waste (LACW)
    - Commercial and industrial waste (C&I), and
    - Construction, demolition and excavation waste (CDE)

  Alongside these three main waste streams this LWA also considers the situation around hazardous waste, radioactive waste, sewage sludge and equine waste. Metal waste is not considered separately as part of this LWA as it is considered that these wastes would form part of the LACW, C&I and CDE as well as the hazardous waste streams so would be captured in the estimates and assessments relevant to these waste streams.

- The current demand for waste management capacity in West Berkshire, as well as the existing management capacity delivered by existing sites, covering the three main waste streams;
    - Local Authority Collected Waste (LACW)
    - Commercial and industrial waste (C&I), and
    - Construction, demolition and excavation waste (CDE)

  Once again, alongside these three main waste streams this LWA also considers the situation for hazardous waste, very low level radioactive waste (VLLW) low level radioactive waste (LLW), intermediate level radioactive waste (ILW), sewage sludge and equine waste.

- The current pattern of movement of waste, by waste type, into and out of West Berkshire and the identification of any strategically important cross boundary flows.

- Forecasts of the likely increases or decreases in waste arisings in each waste stream over the projected plan period (to 2036) including different forecast scenarios.

- Identification of possible additional waste management capacity requirements and surplus waste management capacities over the period to 2036 for each of the waste streams identified giving an indication of the key capacity gaps the emerging minerals and waste development plan document will need to address.

- Any assumptions applied within this report are clearly stated.

2.0 Relevant policy and waste targets

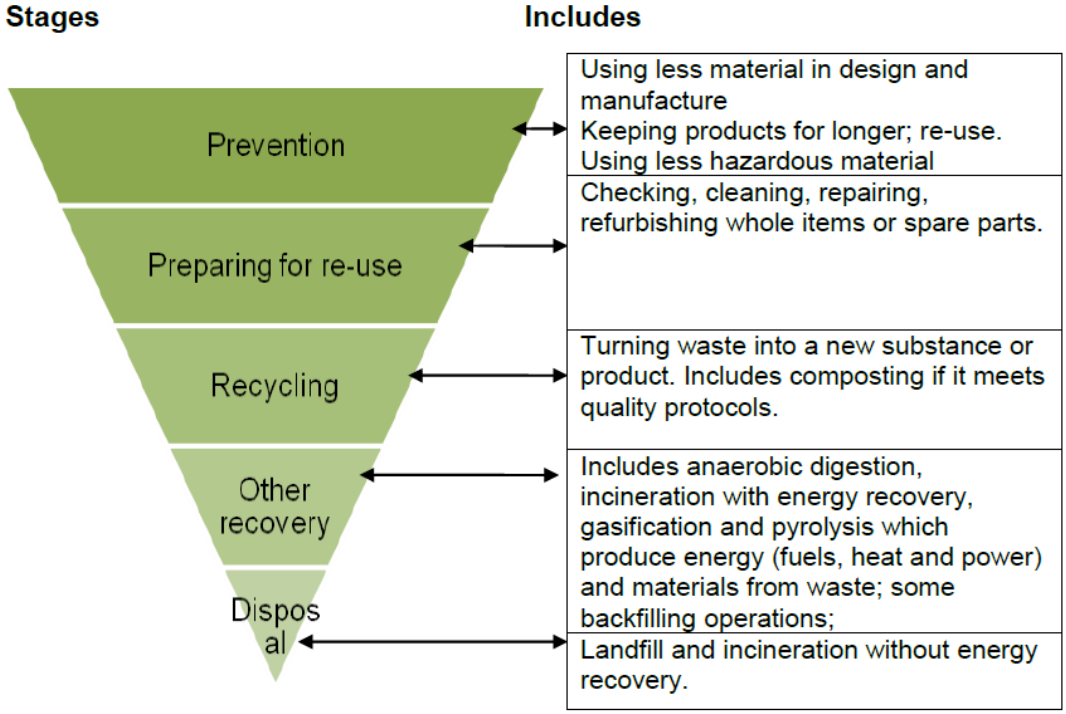
Legislation and Regulations

2.1. In considering the need for future waste management capacity, it is necessary to be mindful of the drivers to waste management now and in the future. A number of the main drivers have been set by the European Union and have been transposed into UK legislation.

2.2. The revised Waste Framework Directive[9] sets a 50% recycling target for waste from households by 2020, and sets the target to reuse, recycle or recover 70% of non-hazardous C&D waste by 2020. The Landfill Directive[10] also requires the diversion of biodegradable municipal waste (BMW) from landfill to 35% of the total BMW (by weight) produced in 1995 by 2020. Interim targets are set for 2010 and 2013.

2.3. The revised Waste Framework Directive[11] also enshrined the waste hierarchy into law. This can be summarised below:

Figure 2.1



[12]

2.4. The revised Waste Framework Directive also clarifies the application of the principle of 'proximity' , requiring Member States to "establish an integrated and adequate network of waste disposal installations and of installations for recovery of mixed municipal waste collected from private households." The requirement includes situations where such municipal collection also covers waste from other producers. The network must enable waste to be disposed of, or be recovered, in one of the nearest appropriate installations, by means of the most appropriate methods and technologies, in order to ensure a high level of protection for the environment and public health. It does not apply to waste not involved in municipal collection such as industrial or construction wastes.

2.5. The directive also requires that the network shall be designed in such a way as to enable the EU as a whole to move towards the aim of self-sufficiency in waste disposal and the recovery of waste.

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[9] http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32008L0098
http://ec.europa.eu/environment/waste/framework/pdf/guidance_doc.pdf
Waste (England and Wales) Regulations 2011 (SI 2011/988)

[11] http://ec.europa.eu/environment/waste/framework/

[12] https://consult.defra.gov.uk/waste/https-consult-defra-gov-uk-waste/supporting_documents/20130711%20%20Consultation%20Plan.pdf

Article 28 of the Directive requires Member states to prepare a Waste Management Plan, When adopted the WBMWLP will form part of the Waste Management Plan for England.

2.6. In order to achieve the requirements of the EU directive in the UK, 'Waste Strategy 2000[13], introduced targets for waste recovery and recycling. These targets were subsequently updated by the Waste Strategy 2007[14], and reviewed in 2011, through the Government Review of Waste Policy in England 2011[15] and In December 2013 central government published the Waste Management Plan for England.

National Guidance and National Policy Statements

2.7. The Government's ambitions for waste highlight the importance of putting in place the right waste management infrastructure at the right time and in the right location.

2.8. The National Planning Policy Framework[16], adopted in 2012, effectively replaced the previous Regional and National planning policy system. The National Planning Policy Framework (NPPF) does not contain specific waste policies, referring to the National Waste Management plan for England. In October 2014 the National Planning Policy for Waste (NPPW) was published. The NPPW comprises part of the National Waste Management plan for England and sets out the planning policy context for waste at a National level.

2.9. The NPPW defines strategic waste management principles for planning policy development and determination of planning applications. The NPPW maintains the premise of driving waste up the waste hierarchy as well as setting out locational criteria to be considered in the development of plans and determination of planning applications.

2.10. The National Waste Management Plan highlights the Government's priorities to achieve a zero waste economy as part of the transition to a sustainable economy and the plan sets out the measures to be taken to ensure that the revised Waste Framework Directive targets are met. In particular by 2020:

(a) At least 50% by weight of waste from households is prepared for re-use or recycled.
(b) At least 70% by weight of construction and demolition waste is subjected to material recovery.

2.11. The Localism Act 2011[17] reinforced the importance of councils' Local Plans for the management of waste, and stresses the importance of close co-operation between waste planning authorities, introduced as a legal requirement by the Duty to Co-operate under section 110 of the 2011 Act.

2.12. Alongside the National Planning Policy Framework, NPPW and the National Waste Management plan are the National Policy Statements (NPSs). The NPSs provide the primary basis for decisions by the Infrastructure Planning Commission (IPC) on applications it receives for certain defined nationally significant infrastructure projects (NSIPs). The functions of the IPC are now carried out by the Infrastructure Planning Unit within the Planning Inspectorate. The NPSs set out Government policy on different types of nationally significant infrastructure projects and, in England and Wales, NPSs are a material consideration in decision making on applications that fall under the Town and Country Planning Act 1990 (as amended). Whether, and to what extent, the NPSs are material considerations is to be assessed on a case by case basis. Some of the relevant elements of the individual NPSs are set out below.

2.13. The Waste Management Plan for England, 2013[18] suggests the adoption of National policies, designed to achieve the aims of the revised Waste Framework Directive. These objectives have been drafted to ensure the protection of the environment and human health by preventing or reducing the adverse impacts of the generation and management of waste and by reducing overall impacts of resource use and improving the efficiency of such use. In this way, they will also

[13] DETR, 2000, *Waste Strategy 2000*, The Stationery Office.
[14] https://www.gov.uk/government/publications/waste-strategy-for-england-2007
[15] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69401/pb13540-waste-policy-review110614.pdf
[16] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/6077/2116950.pdf
[17] http://www.legislation.gov.uk/ukpga/2011/20/contents/enacted
[18] https://consult.defra.gov.uk/waste/https-consult-defra-gov-uk-waste

contribute to the aim of achieving a zero waste economy. It is expected that, in the coming years, there will be a continuing reduction in the amount of waste sent to landfill and an increase in the products and material that are reused, recycled or recovered.

2.14. EN-1: Overarching National Policy Statement for Energy[19] (2011): This overarching government policy includes information on hazardous and non-hazardous waste and places the emphasis on the need to protect human health and the environment, by producing less waste and by using it as a resource wherever possible. Where this is not possible, waste management regulation ensures that waste is disposed of in a way that is least damaging to the environment and to human health. Sustainable waste management is implemented through the "waste hierarchy", which sets out the priorities that must be applied when managing waste:

a) Prevention;
b) Preparing for reuse;
c) Recycling;
d) Other recovery, including energy recovery; and
e) Disposal.

2.15. Disposal of waste should only be considered where other waste management options are not available, or where it is the best overall environmental outcome.

2.16. EN-3: National Policy Statement for Renewable Energy Infrastructure[20] (2011): This NPS taken together with the Overarching National Policy Statement for Energy (EN-1) provides the primary basis for decisions on applications it receives for energy from waste developments, with an electrical output exceeding 50MW. The recovery of energy from the combustion of waste, where in accordance with the waste hierarchy, will play an increasingly important role in meeting the UK's energy needs. Where the waste burned is deemed of 'biogenic' origin, this can also contribute to meeting the UK's renewable energy targets. The Government sees a long term role for energy from waste both as a waste management tool and as a source of energy[21].

2.17. National Policy Statement for Hazardous Waste[22] (2013): The National Policy Statement (NPS) for Hazardous Waste sets out the government policy on the development of nationally significant infrastructure for the management of hazardous waste. New, nationally significant infrastructure for the management of hazardous waste is needed to protect the environment and human health and to allow us to manage hazardous waste in a more sustainable way, recycling and recovering the waste where possible.

2.18. The Planning Act specifies that subject to the applicable thresholds, applications for the following types of projects in the waste sector are covered by this NPS:

Construction of facilities in England where the main purpose of the facility is expected to be the final disposal or recovery of hazardous waste and the capacity is expected to be:

- in the case of the disposal of hazardous waste by landfill or in a deep storage facility, more than 100,000 tonnes per year;
- in any other case, more than 30,000 tonnes per year.

The alteration of a hazardous waste facility in England where the main purpose of the facility is the final disposal or recovery of hazardous waste and the alteration is expected to have the following effect:

- in the case of the disposal of hazardous waste by landfill or in a deep storage facility, *to increase by more than 100,000 tonnes per year* the capacity of the facility;
- in any other case, *to increase by more than 30,000 tonnes per year* the capacity of the facility.

[19] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/47854/1938-overarching-nps-for-energy-en1.pdf
[20] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/47856/1940-nps-renewable-energy-en3.pdf
[21] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/284612/pb14130-energy-waste-201402.pdf
[22] https://www.gov.uk/government/publications/hazardous-waste-national-policy-statement

2.19. National Policy Statement for Waste Water[23] (2012): The Planning Act 2008 sets out the thresholds for nationally significant infrastructure in the waste water sector to which this NPS is relevant. The Act empowers the examination of applications and subsequent decisions on the following waste water NSIPs in England:

- Construction of waste water treatment plants which are expected to have a capacity exceeding a population equivalent of 500,000 when constructed; or
- Alterations to waste water treatment plants where the effect of the alteration is expected to be to increase, by more than a population equivalent of 500,000, the capacity of the plant.

This NPS sets out Government policy on need for waste water infrastructure, general factors for examination and determination of applications, and information on the impacts from waste water infrastructure.

West Berkshire's Local Authority Collected Municipal Waste Targets

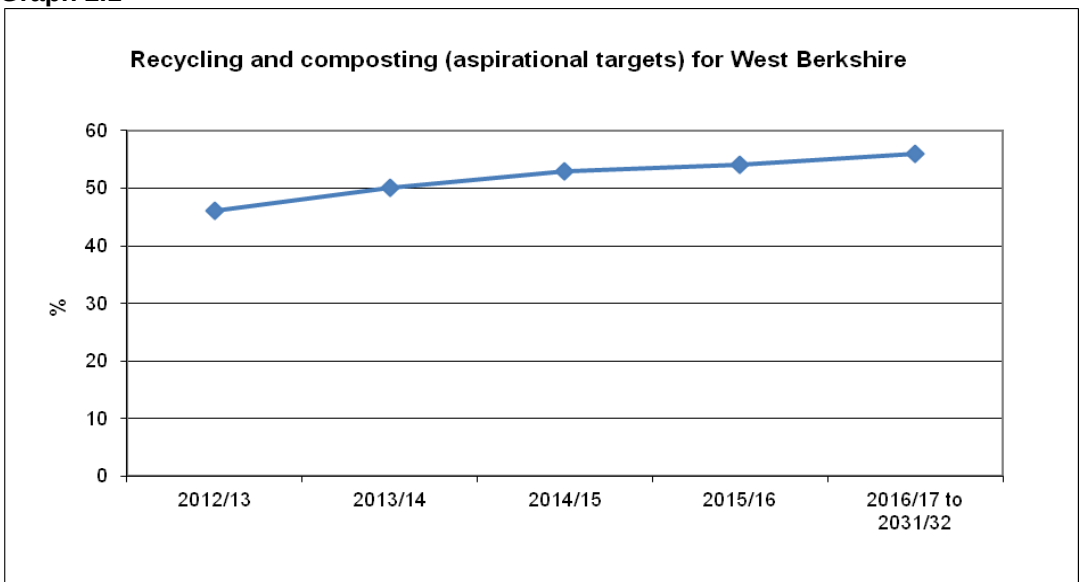
2.20. With regard to targets for municipal solid waste, the Municipal Waste Management Strategy for West Berkshire Council 2002-2022[24], executive summary, adopted 2002 states that its:

> *"assessment of waste disposal options in this strategy indicates that maximising recycling and composting (Option 2) is a potentially cost effective and viable solution for West Berkshire over the short to medium term. However, in order to fulfil the longer term Government recovery targets the Council recognises that further alternative technologies may need to be established in the long term".*

2.21. Table 1.1 of the Municipal Waste Management Strategy document indicates for the chosen option 2, a recycling rate of 44.2% (exclusive of bottom ash recycling) and a recovery rate and landfill diversion of 43.4% could be achieved.

2.22. The West Berkshire Council – Final Business Case for its Integrated Waste Management Contract let in 2008, includes aspirational, guaranteed and forecast composting and recycling targets, though only the aspirational targets for the recycling and composting of household waste are publically available. They are shown on the graph below. The actual proportion of West Berkshire's household waste that is recycled, reused, and composted broadly aligns with these targets (see graph 2.1).

Graph 2.1



For the detailed figures, please see appendix i.

2.23. In addition, West Berkshire Council has set itself the target of minimising the amount of household waste being sent to landfill, by achieving a target of only 20% of waste collected being landfilled. It is

[23] https://www.gov.uk/government/publications/national-policy-statement-for-waste-water
[24] http://info.westberks.gov.uk/CHttpHandler.ashx?id=36818&p=0

understood that the actual proportion of West Berkshire's household waste that is sent to landfill has been below 20% since 2012/13 (see graph 5.1.1).

Summary on Legislation, Regulations and Policies

2.24. What is clear from all these regulations, targets and strategies, is that the UK Government is committed to continuing to move the UK towards a position where waste generation is minimised and the quantities of waste that are generated are seen as an important resource that can re-used and recycled, and only disposed of as a last resort.

2.25. This movement towards waste being considered in a more holistic manner, and in line with a circular economy approach, helps to explain why, in recent years, there has been a clear reduction in waste growth across the majority of most waste streams. However due to the myriad of targets, incentives and regulations, coupled with the complexities of many waste streams, it is difficult to predict whether the current pattern of a decline in waste growth will continue, or whether there will be an increase in due course. What is apparent is that the UK government remain committed to achieving a zero waste economy in the UK, which will impact upon the need for, and the types of, waste management facilities that may be required moving forward.

2.26. The planning process can only do so much in the need to achieve targets for reducing waste and moving the UK towards a zero waste economy. The purpose of the planning process is to consider whether a proposed development is acceptable in a proposed location. Therefore it is challenging for the planning process to ensure that relevant targets are achieved. Even if land for waste management facilities is identified as being necessary and allocated through a plan making process the planning authority has no control over whether or when planning applications will be made for proposals that would manage waste in a way that achieves the relevant targets. Even when planning permission is granted the permitted developments has to be constructed. The planning authority has no control over this either.

3.0 Waste related matters specific to West Berkshire

3.1. This Local Waste Assessment reviews, and seeks to predict the demands placed upon waste management capacity to establish whether West Berkshire Council (as the relevant Waste Planning Authority) is making provision for adequate waste management capacity to meet national and local requirements now and in the future.

3.2. Before looking at the various waste steams individually, this section of the LWA reviews the likely factors that may influence waste arisings, and hence the demand for waste management capacity as well as the potential constraints that may influence the delivery of new capacity or types of waste management facility and review the adequacy of the existing waste infrastructure in West Berkshire.

Factors that may influence future of waste arisings

3.3. Whilst a variety of different factors will influence the quantities of waste arising in each of the various waste streams identified in this LWA, it is considered that there are a number of factors that will have a more holistic influence on waste arisings.

3.4. The drivers that influence patterns of waste generation are complex and poorly understood. However, in the past decade, there appears to have been a decoupling of the historic linkage between population growth and waste growth. The reasoning behind this change is likely to be due to a variety of matters. There has also been a marked shift in how waste is managed and a realisation that waste should be viewed as a resource, coupled with a drive towards minimising the generation of waste.

3.5. There have also been the introduction of fiscal instruments, such as the landfill tax, and requirements from Europe which have also had a marked impact on the cost of waste management. This in turn has influenced waste management methods and potentially production in the past decade. The recent economic downturn, which depressed all aspects of the economy, is also likely to have influenced waste production.

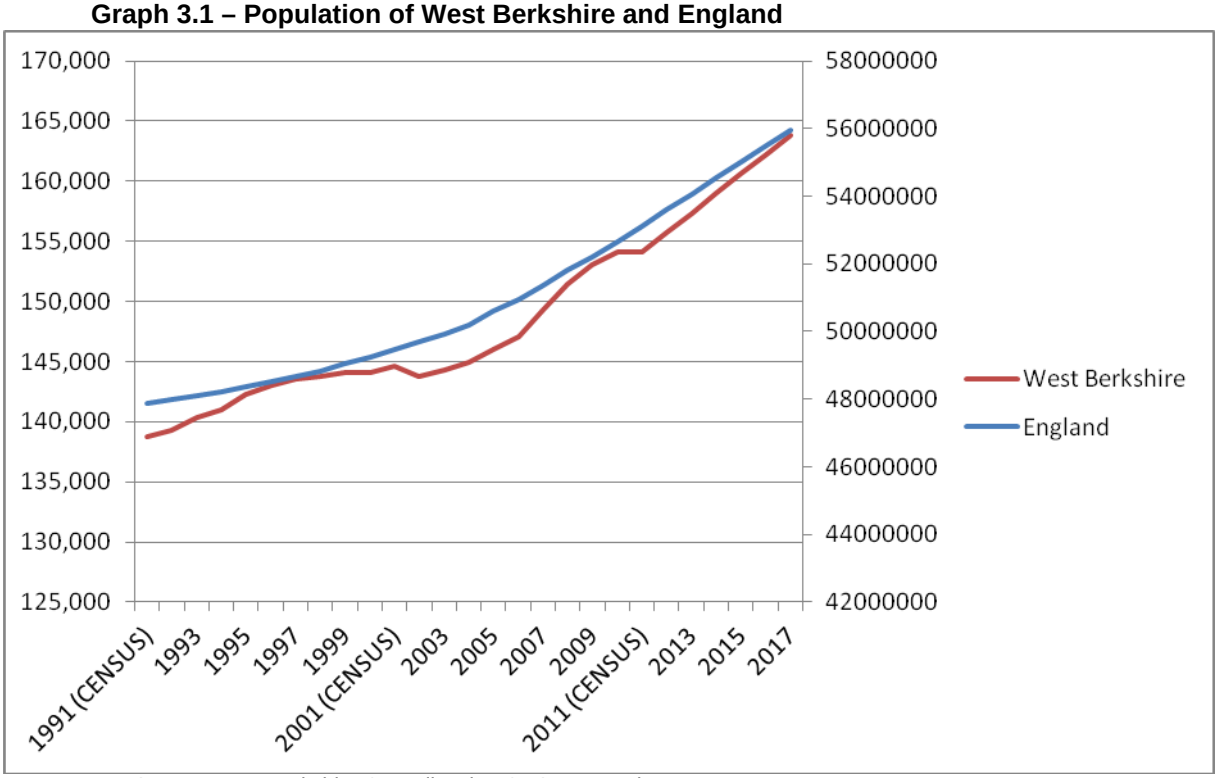
3.6. Notwithstanding these trends it is considered logical that the level of waste arisings, and hence demand for waste management capacity, will, at least in part, be a function of population change and economic activity.

Population

3.7. It is expected that there will be an increase in population in the Plan area over the projected plan period. This projected figures are shown in Table 3.1. This population increase has the potential to result in more waste being generated within the municipal waste stream and also the commercial and industrial waste streams if, as a result of population increase, additional jobs are created within West Berkshire. Population change may also impact upon the level of arisings of other waste streams, such as sewage waste generation and construction and demolition waste if more housing is required to accommodate. It is considered that population change is most likely to affect the level of municipal solid waste arisings on an ongoing basis.

3.8. In the first LWA (December 2013) consideration was given to whether there were any linkages between West Berkshire and wider areas, in terms of the historic growth of population. There was shown to be an apparent correlation between the population growth estimated to have taken place within West Berkshire and the estimated population growth of both the South East of England and that of the whole of England. Graph 3.1 below shows the broad correlation between West Berkshire and England.

Graph 3.1 – Population of West Berkshire and England



Source: West Berkshire Council, using ONS census data.

3.9. As the pattern of population growth across England, the South East and West Berkshire are generally comparable (despite the fluctuations in population growth in West Berkshire and the growth rate being lower that the other areas between 2001 and 2011) the population projections for these wider area have been used to project future population growth in West Berkshire.

3.10. West Berkshire Council has produced population projections to the year 2021, informed by census data and data produced by the Office of National Statistics (ONS). These projections suggest that, over this period, the population of West Berkshire will increase by a further 10% above the level seen in 2011 (on average this equates to a 1% increase per year). This is a slightly greater percentage increase than the projected level of population increase for England between 2010 and 2020, of 8.4%.

3.11. Using the assumption that population growth in West Berkshire will continue to increase at a rate of 1% over the projected plan period it is possible to predict the population of West Berkshire over the projected plan period. This is shown in table 3.1 below.

Table 3.1

Year	Estimated Population
2011	*154,200*
2015	160,461
2020	168,646
2025	177,249
2030	186,290
2035	195,793
2036	*197,751*

3.12. Whilst this is only a broad estimate, this suggests that the total population of West Berkshire will have increased by approximately 28% by the end of the plan period. If an assumption is made that the quantity of Local Authority Collected Waste (LACW) arisings have a direct relationship to population, this would suggest that LACW arisings will also increase over the projected plan period and theoretically this could result in a similar percentage increase of total LACW waste arisings (28%). However the historic data on LACW arisings, detailed in the December 2013 LWA and further below in this LWA, show that, in recent years the ongoing increase in population does not appear to have resulted in an increase of waste arisings. i.e. waste production appears to have been decoupled from population growth.

Housing Completions and future growth in households

3.13. Linked to population growth is the likely growth in the number of households in West Berkshire. The projected level of housing completions needed to house the population of West Berkshire in the future is therefore a factor which may influence future construction and demolition waste arisings. The number of housing completions are recorded by West Berkshire Council on an annual basis and published in the Council's Annual Monitoring Report (AMR).

3.14. The adopted West Berkshire Core Strategy contains proposals for the delivery of at least 10,500 homes over the plan period (2006 – 2026) at a rate of 525 net additional dwellings per annum. Of the requirement for 10,500 dwellings in the Core Strategy period 2006 - 2026, 5012 additional units were completed to March 2016.

3.15. The Inspector's report following the Examination in Public for the West Berkshire Core Strategy concluded that the 2007 Berkshire Housing Market Assessment did not provide a clear understanding of housing needs and demands in the area as required in the NPPF, and indicated a substantial need for affordable housing.

3.16. Therefore, the six Berkshire unitary authorities, together with the Thames Valley Berkshire Local Enterprise Partnership (LEP), commissioned the preparation of a Strategic Housing Market Assessment (SHMA) for the relevant housing market areas. The conclusions show West Berkshire to be located within a housing market area (HMA) that also includes Reading, Wokingham and Bracknell Forest. The overall Objectively Assessed Need (OAN) was assessed as 665 dwellings per annum over the period 2013 - 2036. The SHMA itself however, does not set a new housing target, as this will be set through the new Local Plan following additional work on constraints and opportunities for development, carried out in cooperation with the other authorities within the HMA.

3.17. Ultimately this could result in a potential consequential increase in construction and demolition waste arisings, however given the fairly low numbers of houses likely to be planned for and built, this is unlikely to result in any significant change to the patterns of future construction and demolition waste arisings in West Berkshire, particularly on an annual basis.

Economic growth at a National level

3.18. It is considered that economic growth will affect the quantities of waste arising in West Berkshire, particularly the level of commercial and industrial waste arisings. The following national level forecasts were considered in the first LWA (December 2013) as it was considered that they would provide broad indications of future waste generation in West Berkshire: Construction Industry Forecasts[25][26], HM Treasury forecasts[27], PricewaterhouseCoopers (PwC) forecasts of GDP and inflation, and predicted changes in economic growth through the use of Gross Value Added (GVA) calculations.

3.19. While the forecasts provided an overall indication of the anticipated future waste management capacity demand, such National level forecasts alone are unlikely to provide a reliable basis for generating forecasts of future waste arisings necessary for plan -making in West Berkshire.

3.20. The following national forecasts were considered in the production of this version of the LWA: Construction Products Association Forecasts, Spring 2015, HM Treasury (November 2016)[28], The Office for Budget Responsibility Economic and Fiscal outlook (November 2016)[29] PricewaterhouseCoopers (PwC) (November 2016) UK Economic Outlook[30].

3.21. All these forecasts suggest that there is much uncertainty in respect of the implications of the Brexit decision on the economy given that the details of Brexit remain an unknown at this stage. None of the forecasts that have been reviewed indicate that either general economic activity or construction activity in England will increase dramatically in the short term, with some forecasts specifically

[25] ONS, Construction Products Association. http://www.dodsmonitoring.com/downloads/misc_files/CPA18.pdf
[26] Output in the Construction Industry, March and Q1 2013 http://www.ons.gov.uk/ons/dcp171778_307070.pdf
[27] HM Treasury, Forecasts for the UK economy: a comparison of independent forecasts, Macroeconomic Prospects Team, No. 313 May 2013. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/199018/201305_-_Forecasts_for_the_UK_economy.pdf
[28] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/569316/PU797_Forecast_for_the_UK_Economy_Nov_2016_355.pdf
[29] http://budgetresponsibility.org.uk/download/economic-and-fiscal-outlook-november-2016/
[30] http://www.pwc.co.uk/services/economics-policy/insights/uk-economic-outlook.html

identifying a decline in the construction industry. In general, the forecasts reviewed indicate limited increased economic activity, however it must be noted that all of the current forecasts reviewed are all heavily caveated, given the considerable level of uncertainty around the impact and implications of Brexit on the economy.

National Infrastructure proposals

3.22. Alongside local level development factors that may influence waste arisings it is considered prudent to review any known factors at a wider than local level, which may have an impact on future waste arisings.

3.23. The National Infrastructure Plan[31] mentions numerous infrastructure projects which may have implications for waste production, particularly CDE waste. Two projects which are likely to result in more CDE waste being managed on a temporary basis in West Berkshire are the development of both the M4 Smart motorway system, part of which passes through West Berkshire, and Crossrail, the most western station being Reading which is a neighbouring authority.

Constraints in West Berkshire which may affect waste arisings or the delivery of new waste facilities.

3.24. West Berkshire is a relatively small authority area, constrained by a number of environmental designations, shown on the map (3.1) below (most notably the North Wessex Downs Area of Outstanding Natural Beauty, which covers 74% of the district). These constraints have the potential to restrict all types of future development within West Berkshire. Such restrictions suggest that it is unlikely that West Berkshire will see significant new development within the projected plan period likely to result in a significant increase in the generation of waste above the current baseline. Such constraints may result in an increase in re-development of existing sites and refurbishment of existing buildings. Such developments have the potential to generate waste as part of the redevelopment processes, particularly construction and demolition waste albeit at a lower level than new build. The specialist management requirements of certain wastes (e.g. hazardous and radioactive) together with the constrained authority area, means that waste movements into and out of West Berkshire will inevitably occur.

3.25. As with any industry, from the perspective of potential investors, there is the issue of viability. With respect to waste management facilities there are clear throughput thresholds which dictate when a new facility becomes financially viable. If a facility cannot source sufficient waste materials to make the operation of the facility economically viable then it would not be developed. This can be particularly problematic in the waste management sector given the relatively intense competition resulting in fluidity of the market. The predominantly rural nature of West Berkshire also means that waste arisings are relatively dispersed, and this, coupled with the relatively small quantities of waste produced, may mean that certain facilities are unlikely to be developed in the authority area. Whilst this is not necessarily a planning matter it is an important factor when assessing the future requirement for waste management capacity.

3.26. A further issue in West Berkshire, in respect of one particular waste management method, namely disposal of waste via landfill, is the underlying geology. Historically mineral extraction sites were used for landfilling waste. In previous decades this was also the dominant method of waste management seen in West Berkshire. However the last landfill site in West Berkshire permitted to accept non-inert waste ceased accepting such waste in 2005.

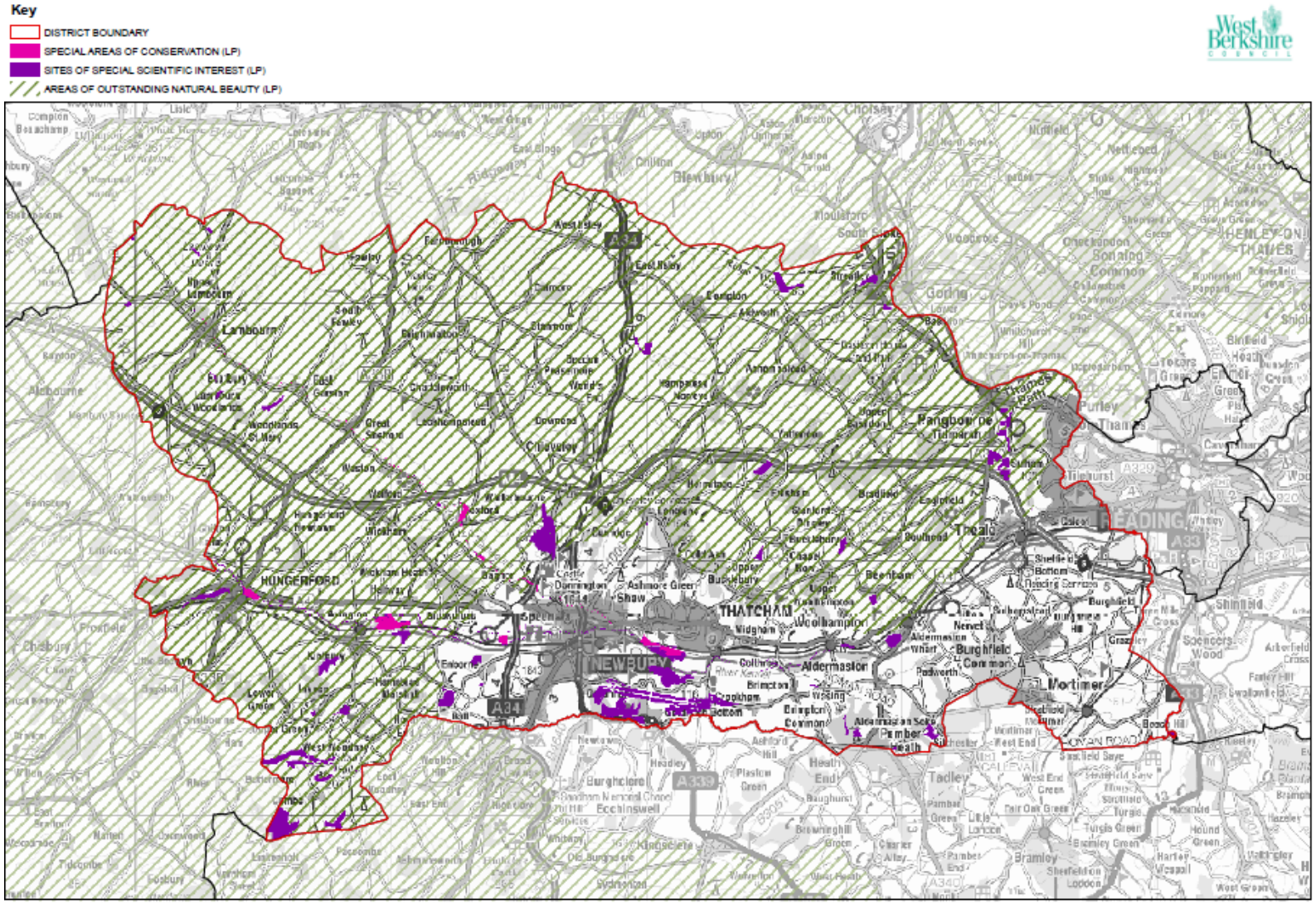
3.27. Recent changes to the siting criteria relating to non-inert landfills introduced through the Landfill Directive are such that the deposits of minerals currently worked in West Berkshire (relatively shallow sand and gravel deposits) would not be suitable without considerable investment for infill with anything other than inert waste materials. Therefore, for a number of years, all of the non inert waste generated in West Berkshire disposed of to landfill, has been exported to landfill sites, predominantly in neighbouring authority areas.

3.28. Working mineral sites in West Berkshire are now restored using solely inert waste materials (construction, demolition and excavation waste) or are restored to a lower level without the need for the importation of fill material.

[31] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/520086/2904569_nidp_deliveryplan.pdf

3.29. There are clearly many other factors, policies, incentives and regulations, both at the local and national level, that can, and do, affect the level of waste arisings within West Berkshire. Such matters are detailed later in the LWA, following a review of the current provision of waste management facilities.

Map 3.1



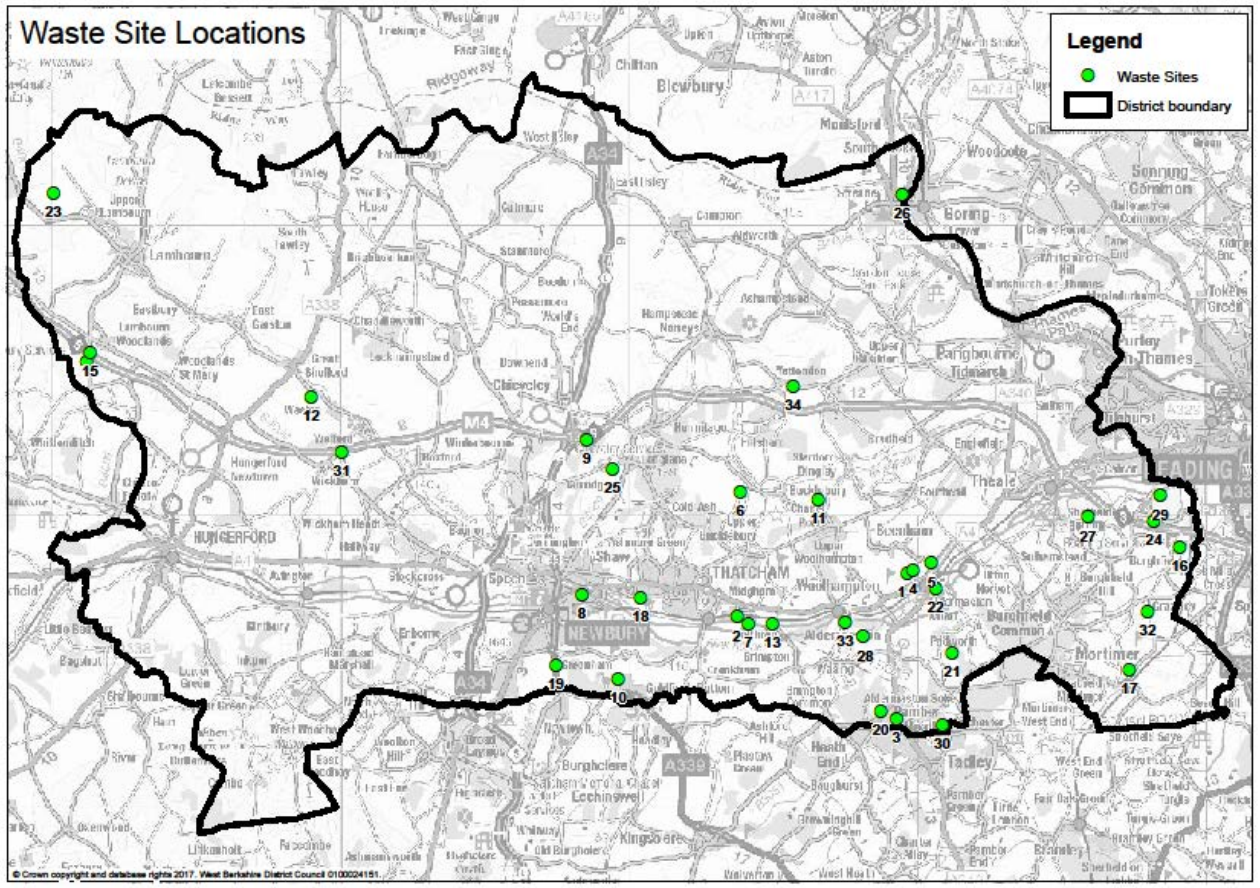
[32]

[32] Reproduced from Ordnance Survey map with the permission of the Controller of Her Majesty's Stationery Office (c) Crown Copyright 2017. West Berkshire District Council 0100024151. © Natural England copyright. Contains Ordnance Survey data © Crown copyright and database right 2017

4.0 Current Status of Waste Management sites

4.1. There are a significant number of waste management facilities already operating in West Berkshire that manage the various waste streams arising within the authority area. Some facilities also manage waste arising outside West Berkshire. This chapter of the LWA considers these facilities and, where possible, identifies any known limitations that may influence the future available capacity of the site. The following map illustrates the location of the waste management facilities in the District that benefit from planning permission - permanent and time limited/temporary (as at December 2016).

Map 4.1



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[33] Reproduced from Ordnance Survey map with the permission of the Controller of Her Majesty's Stationery Office (c) Crown Copyright 2017. West Berkshire District Council 0100024151.

Waste Management Sites with planning permission

4.2. The following tables summarise the existing waste management facilities in West Berkshire that are either operational, or have planning consent. These tables have been separated into similar types of facilities. Where it is clear that more than one type of activity takes place on a single site it has more than one entry. However it is not always clear what function is being carried out at a site. For example there is always going to be an element of waste transfer taking place at a materials recycling facility, as there will be a fraction of the waste being sorted for recycling that cannot be recycled so this waste is merely bulked up and transferred, normally for recovery or disposal.

Table 4.1 Household Waste Recycling Centres (HWRCs)

Facility name	Facility address	End date	Site Status	Consented capacity in 2015 (tonnes per annum) [34]	Limitations / Notes
Padworth Integrated Waste Management Facility (site no 22 on map 4.1)	Veolia Environmental Services. Padworth IWMF, Padworth Lane, Lower Padworth, Reading. Berkshire. RG7 4JF 11/00923/MINMAJ	Permanent consent	Operational	7,000	Whole site conditioned to 95,000 tpa indicated within application submission split between: HWRC (7ktpa) Biological (29 ktpa) MRF (40ktpa) & Waste Transfer (19ktpa)
Newtown Road (site no 19 on map 4.1)	Household Waste Recycling Centre. Newton Road, Newbury. RG20 9BB 06/00960	Permanent consent	Operational	23,000	Maximum annual throughput condition of 23,000 tonnes per annum
Total available consented capacity				30,000	

[34] Permitted figures are those identified in planning consents / planning applications, i.e. the capacity governed by the planning consent. (Figures in brackets) refer to EA licensed capacity (tonnes)

Table 4.2 - Landfill Sites

Facility name	Facility address and planning application number	End date	Site Status	Total consented inert landfill capacity in 2015 (m3) [3534]	Limitations
Copyhold Farm Quarry (site no 9 on map 4.1)	The Quarry, Copyhold Farm, Curridge, Thatcham, Berkshire. RG18 9DR 15/02675/MINMAJ	Time limited consent	Operational	4,000m^3	End date for importation of waste: 15th October 2018. The site is nearing completion in terms of extraction and infilling. This volume is estimated using returns from the previous 2 years.
Kennetholme Farm (site no 13 on map 4.1)	Kennetholme Farm, Bath Road, Midgham, Reading. Berkshire. RG7 5UX 13/02302/MINMAJ	Time limited consent	Operational	170,000m^3	End date for importation of waste: 11 years from commencement of extraction operations ~2020. Annual capacity is approximately 100,000 tonnes (80,000m^3).
Herons Nest (site no 27 on map 4.1)	Herons Nest Landfill Site, Station Road, Theale, Reading. Berkshire. RG7 4AL 15/02043/MINMAJ	Time limited consent for importation of soils only	Operational	80,000m^3	End date for importation of waste: 31st December 2017. Annual capacity is approximately 100,000 tonnes (80,000m^3)
Moores Farm (site no 16 on map 4.1)	Moores Farm, Pingewood, Reading. Berkshire. RG30 3UH 14/03295/MINMAJ	Time limited consent	Operational	100,000m^3	End date for importation of waste: 31st December 2019. Annual capacity is approximately 140,000 tonnes (112,000m^3)

[35] Permitted figures are those identified in planning consents / planning applications, i.e. the capacity governed by the planning consent.

Facility name	Facility address and planning application number	End date	Site Status	Total consented inert landfill capacity in 2015 (m3) [3534]	Limitations
Wasing Lower Farm (site no 28 on map 4.1)	Lower Farm Wasing Lane Aldermaston Reading Berkshire RG7 4LY 12/01220/MINMAJ	Time limited consent	Permitted, non-operational	Currently zero m^3 (however 1.25 million m^3 will be created)	End date for importation of waste: 15 years from commencement of extraction operations. Void has yet to be created. Annual capacity is approximately 90,000m^3.
Total available consented capacity in 2015				354,000m^3 (plus 1.25 million m^3 has yet to be created)	

Table 4.3 - Biological treatment : Thermal facilities, composting facilities, and sewage treatment

Facility name	Facility address	Facility type	End date	Site Status	Consented capacity in 2015 (tonnes per annum) [36]	Limitations/Comments
Beenham (site no 4 on map 4.1)	Grundon Ltd. Grange Lane, Beenham. Reading. RG7 5PY 06/01885	Composting	Permanent	Operational	25,000	Maximum annual throughput 25,000 tpa
Padworth Integrated Waste Management Facility (site no 22 on map 4.1)	Veolia Environmental Services. Padworth IWMF, Padworth Lane, Lower Padworth, Reading. Berkshire. RG7 4JF 11/00923/MINMAJ	Composting facility	Permanent	Operational	29,000	Whole site conditioned to 95,000 tpa indicated within application submission split between: HWRC (7ktpa) Biological (29 ktpa) MRF (40ktpa) & Waste Transfer (19ktpa)

[36] Permitted figures are those identified in planning consents / planning applications, i.e. the capacity governed by the planning consent.

Facility name	Facility address	Facility type	End date	Site Status	Consented capacity in 2015 (tonnes per annum) [36]	Limitations/Comments
Theale Waste Recycling and Transfer Facility Biomass boiler (site no 27 on map 4.1)	Theale Waste Recycling and Transfer Facility, Deans Copse Road, Theale 16/01200/MINMAJ	Biomass boiler (burning waste wood) and material drying system	Permanent	Permitted - Non-operational	2,500	Whole site conditioned to 150,000 tpa in the planning consent
Reading Quarry (site no 24 on map 4.1)	Reading Quarry, Berrys Lane, Burghfield, Reading. Berkshire. 08/02401/FUL	Biomass boiler (burning waste wood) and material drying system	Permanent	Permitted - Non-operational	2,500	Whole site conditioned to 275,000 tpa in the planning consent
Greenham Business Park biomass gasification plant (site no 10 on map 4.1)	Greenham Business Park, Greenham, Thatcham, Berkshire, RG19 6HW 14/01735/COMIND	Gasification of Grade A waste wood to generate electricity	Permanent	Permitted – Non - Operational	73,000	Tonnage quoted in application submission
Hillfoot Farm Anaerobic Digester (site no 11 on map 4.1)	Hillfoot Farm, Hillfoot, Chapel Row, Reading, Berkshire, RG7 6PG 11/01849/FUL	Combined Heat and Power (CHP) Plant via Anaerobic Digestion using mixed crops and slurry from within the agricultural unit as feedstock	Permanent	Operational	400	Throughput is approximately 4000tpa (approximately 3600 tonnes crop tissue, and 400 tonnes cattle slurry) while the most recent operator returns indicate that the capacity is 6000tpa. Mixed crop tissue not considered as waste, however cattle slurry is agricultural waste.

Facility name	Facility address	Facility type	End date	Site Status	Consented capacity in 2015 (tonnes per annum) [36]	Limitations/Comments
Park Farm Composting (site no 23 on map 4.1)	Upper Lambourn, Hungerford, RG17 8RD	Composting of equine waste	Permanent	Operational	4,000	
Newbury Sewage Treatment Works (site no 18 on map 4.1)	Lower Way, Newbury, Berkshire, RG19 3TL	Traditional activated sludge process	Permanent	Operational	7,300	
Total available consented capacity					143,700	

Table 4.4 - Recycling and transfer facilities

Facility name	Facility address	Facility type	End date	Site Status	Consented capacity in 2015 (tonnes per annum) [37]	Limitations/Comments
A4 Breakers (site no 1 on map 4.1)	A4 Breakers. Sevenacre Copse, Grange Lane, Beenham. Reading. Berkshire. RG7 5PT 13/00343	Metal recycling	Permanent lawful use	Operational	4,680	
Beenham (site no 5 on map 4.1)	Grundon Ltd. Grange Lane, Beenham. Reading. RG7 5PY 00/00926/FUL and 147701	Materials recycling facility	Permanent permission	Operational	65,000 (35,000 transfer)	65,000 from most recent operator returns

[37] Permitted figures are those identified in planning consents / planning applications, i.e. the capacity governed by the planning consent.

Facility name	Facility address	Facility type	End date	Site Status	Consented capacity in 2015 (tonnes per annum) [37]	Limitations/Comments
Padworth Integrated Waste Management Facility (site no 22 on map 4.1)	Veolia Environmental Services. Padworth IWMF, Padworth Lane, Lower Padworth, Reading. Berkshire. RG7 4JF 11/00923/MINMAJ	Materials recycling facility and waste transfer	Permanent permission	Operational	59,000 (19,000 transfer)	Whole site conditioned to 95,000 tpa indicated within application submission split between: HWRC (7ktpa) Biological (29 ktpa) MRF (40ktpa) & Waste Transfer (19ktpa)
Reading Quarry (site no 24 on map 4.1)	Reading Quarry, Berrys Lane, Burghfield, Reading. Berkshire. 08/02401/FUL	Construction & Demolition Recycling	Permanent permission	Operational	275,000 (27,500 transfer)	Maximum annual throughput conditioned to 275,000 tpa in consent
Theale Waste Recycling and Transfer Facility (site no 27 on map 4.1)	Theale Waste Recycling and Transfer Facility, Deans Copse Road, Theale 16/01200/MINMAJ	Materials recycling facility : skip waste, and waste transfer	Permanent permission	Operational	147,500 (based on 70% recycling rate equates to 44,250 transfer)	Whole site conditioned to 150,000 tpa – condition in consent
Padworth Breakers (site no 21 on map 4.1)	Wrays Farm, Rag Hill, Aldermaston. RG7 4NY Site with established use	Metal recycling	Permanent permission	Operational	2,500	Environmental permit allows up to 4,999 tonnes however recent site throughput data is approximately half of this
Old Stocks Farm * (site no 20 on map 4.1)	Old Stocks Farm Paices Hill Aldermaston Reading Berkshire RG7 4PG 12/03092/MINMAJ	Construction & demolition and skip waste recycling and transfer station	Permanent permission	Operational	25,000 (based on 70% recycling rate equates to 7,500 transfer)	Whole site conditioned to 25,000 tpa Once site has been comprehensively redeveloped whole site conditioned to 75,000 tpa

Facility name	Facility address	Facility type	End date	Site Status	Consented capacity in 2015 (tonnes per annum) [37]	Limitations/Comments
Copyhold Farm (site no 9 on map 4.1)	The Quarry, Copyhold Farm, Curridge, Thatcham, Berkshire. RG18 9DR 15/02309/MINMAJ	Construction & demolition and skip waste recycling and transfer station	Temporary permission	Operational	75,000	75,000 provided in most recent operator returns. Will cease on conclusion of infilling operations permitted by planning permission 15/02675/MINMAJ or on 15 October 2018, whichever is the earlier
Colthrop Aggregate Processing Plant (site no 7 on map 4.1)	Grundon Ltd. Kennetholme Quarry, Colthrop Lane, Thatcham. Berkshire. RG19 4NT 13/01206/FUL	Construction & Demolition Recycling	Permanent permission	Operational	15,000	Tonnage conditioned in planning consent
Whitehouse Farm (site no 30 on map 4.1)	Whitehouse Farm, Silchester Road, Tadley. RG26 3PZ 10/02590 and 146999	Construction & demolition and skip waste recycling and transfer station	Permanent permission	Operational	100,000 (30,000 transfer)	100,000 based on most recent operator returns. EA licensed capacity (based on 74,999 Construction & Demolition Recycling, and 24,999 Commercial and Industrial Recycling)
Avon site (site no 2 on map 4.1)	Land At Colthrop Business Park Colthrop Lane Thatcham West Berkshire 02/01805 and 11/00980	Construction & demolition and skip waste recycling and transfer station	Permanent permission	Operational	93,000	Site proposed on the basis it would manage 150,000 tpa (75% skip waste, 25% inert). However in reality only road planings are crushed and screened and output has not exceeded 22,000. The EA permit restricts capacity to 93,000.

Facility name	Facility address	Facility type	End date	Site Status	Consented capacity in 2015 (tonnes per annum) [37]	Limitations/Comments
Woodside Recycling (site no 32 on map 4.1)	Woodside Farm, Goodboys Lane, Reading. RG7 1ND 01/00819	Paper Waste Transfer Station	Permanent lawful use	Operational	No limitations on tonnage	Established use, no limitations
Weirside (site no 29 on map 4.1)	Land Weirside Burghfield Bridge Burghfield Reading Berkshire RG30 3XN APP/W0340/A/06/2026286/NWF and 05/02928	Materials Recovery Facility: skip waste	Permanent	Non-operational	20,000 (6,000 transfer)	Planning permission granted on appeal requires a building to be constructed and it has not been as yet. The application submission made reference to the management of 20,000 tonnes. In reality at this current time an unauthorised scrap metal operation is based on the site with other unauthorised uses also alleged to be being undertaken on site
Moores Farm (site no 16 on map 4.1)	Moores Farm, Pingewood, Reading. Berkshire. RG30 3UH 14/03295/MINMAJ	Recycled aggregate producer and inert infilling of quarry voids	Temporary permission	Operational	35,000	End date for importation of waste: 31st December 2019. Overall annual capacity is approximately 140,000 tonnes (112,000m3), although approximately 35,000 tonnes recycling capacity

Facility name	Facility address	Facility type	End date	Site Status	Consented capacity in 2015 (tonnes per annum) [37]	Limitations/Comments
Total available consented capacity					914,180 tonnes (of which 169,250 tonnes is transfer)	For sites being managed as recycling and transfer facilities, transfer capacity as a proportion of waste recycled/transferred has been agreed between WBC officers and site operators, and where this was not possible a recycling/transfer ratio of 70% / 30% has been assumed.

Table 4.5 - Specialist treatment sites

Facility name	Facility address	Facility type	End date	Site Status	Capacity in 2015 (tonnes per annum)	Limitations/Comments
Computer Salvage Specialists (site no 8 on map 4.1)	5 Abex Road, Newbury. RG14 5EY 09/02183	WEEE	Permanent	Operational	4,999	Based on Environmental Permit information. (Waste Operator returns suggest capacity is 25,000tpa)
Membury Airfield (site no 15 on map 4.1)	Membury Airfield, Rambury Road, Lambourn. RG17 7TY	Specialist treatment: Waste solvent disposal and disposal and recovery of oils and minerals	Permanent	Operational	4,500	Based on Environmental Permit information

AWE (Aldermaston) (site no 3 on map 4.1)	AWE Aldermaston Aldermaston Reading Berkshire RG7 4PR 03/00533/FUL	Specialist treatment (VLLW, LLW and ILW)	Permanent	Operational	30,000	Based on Environmental Permit information
AWE (Aldermaston) (site no 3 on map 4.1)	AWE Aldermaston Aldermaston Reading Berkshire RG7 4PR	VLLW, LLW and ILW transfer	Permanent	Operational		
AWE (Aldermaston) (site no 3 on map 4.1)	AWE Aldermaston Aldermaston Reading Berkshire RG7 4PR	VLLW, LLW and ILW storage	Permanent	Operational		
Whitehouse Farm (site no 30 on map 4.1)	Whitehouse Farm, Silchester Road, Tadley. RG26 3PZ 128099	Transfer (specialist treatment): asbestos	Permanent	Operational	4,999 (4,999)	Maximum annual throughput 4,999 tpa
Total available consented capacity					>39,998	Broad estimate due to limited data on actual capacities available

Table 4.6 - Other known waste management sites which reprocess/reuse waste

Facility name	Facility address	Facility type	End date	Site Status	Capacity in 2015 (tonnes)	Limitations/Comments
Rookery Farm (site no 25 on map 4.1)	Rookery Farm, Curridge Green, Thatcham. RG18 9EA 07/00347	Reprocessing site for scrap plastic chipping	Permanent	Operational	6,000	6,000 based on most recent operator returns
Martin Collins Enterprises (site no 14 on map 4.1)	Cuckoo Copse, Lambourn Woodlands, Membury Airfield, Hungerford. 04/02545	Reprocessing tyre and plastic	Permanent	Operational	Unknown	

Waste management capacity based on Environment Agency site permits

4.3. Although the data referred to here is arguably dated at this point, it serves to illustrate a point. In 2013 a study by the Environment Agency (EA) indicated that the number of sites with EA permits at the end of 2012, in England and Wales was 9,510, however only 6,381 of these accepted waste in 2012. This illustrates the point that not all sites that benefit from an environmental permit actually receive waste for management, such that the total "permitted capacity" for an area is likely to exceed the actual quantity of waste being processed at the sites that benefit from a permit. This matter is further complicated by the fact that the maximum capacity of a site with a permit is often based on a charge banding approach. This means that a waste management site that has planning consent for a throughput of 50,000 tonnes per annum, may obtain a permit that will allow them to process (say) up to 75,000 tonnes per annum.

4.4. Therefore if the "capacity", as stipulated in the environmental permit, for such a site were to be used to calculate the maximum capacity of this site it would result in an over estimate of the actual consented capacity by 50%. Similarly that same site may only actually process 25,000 tonnes in a year, meaning that were the "capacity" for the site to be based on actual throughput, this would under estimate the consented capacity by 50%. Therefore caution must be used when capacities are derived from permit data alone.

4.5. In light of the data reliability identified above, capacity figures for each site are primarily based on site monitoring by officers, information submitted as part of planning applications and discussions with operators. Where this has not been possible permit data has been used as the best available data.

Summary of existing waste management sites in West Berkshire.

4.6. The following table provides a summary of the estimated waste management capacity available at existing sites in West Berkshire (in tonnes of capacity per year).

Table 4.7

Facility type	Capacity in 2015 (tonnes)
Household Waste Recycling Centres	30,000
Biological treatment : thermal facilities, composting facilities, and sewage treatment	143,700
Recycling and Transfer facilities	914,180 (of which approximately 169,250 tonnes is transfer)
Specialist Treatment Sites	>39,998
Total	1,127,878
Total (excluding transfer)	958,628

4.7. This table above shows that the consented waste infrastructure in West Berkshire, could manage over 1 million tonnes of waste arisings per year. However when the available transfer capacity is removed (on the assumption that waste transfer capacity does not actually "manage" the waste, and can potentially result in the double counting of waste inputs) then this capacity value reduces to approximately 958,628 tonnes per annum.

4.8. In addition it is understood that in 2015 there was around 354,000m^3 of inert waste landfill capacity consented in West Berkshire (with 1.25 million m^3 having yet to be created through consented mineral extraction). It is recognised that a number of the existing consented waste management (recycling and transfer) sites in West Berkshire currently operate under temporary permissions.

4.9. A number of observations can be made from this summary of the existing waste management facilities in West Berkshire as follows:

- West Berkshire has no hazardous landfill capacity.
- West Berkshire has no non-hazardous landfill capacity.
- West Berkshire has no low level or intermediate level radioactive waste disposal capacity.

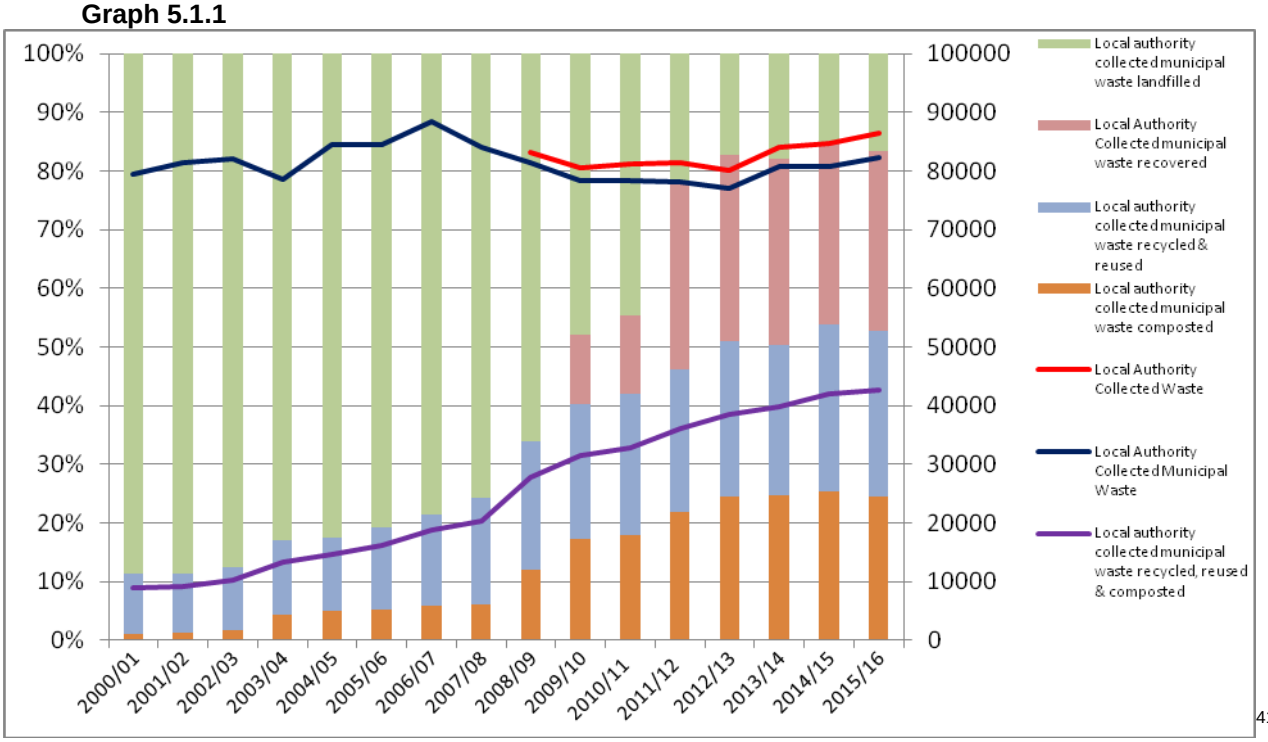
- West Berkshire has very little waste recovery capacity (and the little that there is generates heat or electricity by burning wood waste).

5.1 Local Authority Collected Municipal Waste / Local Authority Collected Waste arisings

5.1.1. The following graph (5.1.1) presents the evolving pattern of management of West Berkshire's Local Authority Collected Waste[38] arisings during recent years. For the detailed breakdown of this information, please view appendix ii[39].

5.1.2. Graph 5.1.1 shows that in West Berkshire the percentage of Local Authority Collected Municipal Waste (LACMW) arisings being disposed of to land has decreased and the percentage of arisings recycled, reused or composted has increased, while the total LACMW has remained relatively consistent. The completion of a new waste management contract in 2008, has seen the introduction of the recovery of residual waste generated in West Berkshire via EfW outside West Berkshire (in Hampshire). In 2011/12 it can be seen that the quantity of waste arisings subject to recovery exceeded the quantities landfilled, and this trend has continued through to 2015/16. This is similar to that experienced for England and the south east throughout this period and this was examined in more detail in the first LWA (December 2013)[40].

Graph 5.1.1



[41]

5.1.3. West Berkshire achieved nearly 53% recycling, reuse and composting of local authority collected municipal waste in 2015/16. The District appears to be slightly ahead of the aspirational recycling and composting schedule that was set out within the West Berkshire Council – Final Business Case for its Integrated Waste Management Contract drafted in 2008.

5.1.4. Of note, over the period 2000/01 to 2015/16 is that the total Local Authority Collected Municipal Waste arising remained relatively constant. At the same time the population has also increased by approximately 8% which further indicates the decoupling of population growth and overall waste requiring management. As the proportion of recycling, composting and reuse of waste has increased,

[38] Local Authority Collected Waste is all waste collected by the local authority. This is a slightly broader concept than Local Authority Collected Municipal Waste (LACMW) as it would include both this and non municipal fractions such as construction and demolition waste.
[39] Some tonnages may differ slightly to those in other data sources due to figures being derived from percentages in some cases, however if this is the case then these differences are likely to be within a few hundred tonnes at most
[40] http://info.westberks.gov.uk/CHttpHandler.ashx?id=35870&p=0
[41] Data from West Berkshire Council Waste Management Service, February 2017.

the disposal to landfill has reduced, such that by 2015/16 this amounted to between a quarter and a fifth of that in 2007/08 in total tonnage terms. The recovery of residual waste has now become a key management tool for the quantities of Local Authority Collected Municipal Waste in West Berkshire. However, in tonnage terms, only around 25,000 tonnes of Local Authority Collected Municipal Waste was sent for energy recovery in 2015/16. This quantity of waste is unlikely to justify an energy recovery facility in its own right, when typical capacities of existing recovery facilities are considered.

5.2 Local Authority Collected Municipal Waste / Local Authority Collected Waste projections

5.2.1 The National Planning Policy Guidance states in paragraph 29 (Reference ID: 28-029-20141016; Revision date: 16 10 2014):

It will be helpful to examine municipal waste arisings according to source (i.e. household collections, civic amenity site wastes, trade waste etc.). This may allow growth to be attributed to particular factors and to inform future forecasts.

A 'growth profile', setting out the assumed rate of change in waste arisings may be a useful starting point for forecasting municipal waste arisings. The growth profile should be based on two factors:

- *Household or population growth; and*
- *Waste arisings per household or per capita.*

5.2.2 Data on arisings of the local authority collected municipal waste stream is well documented in comparison to other waste streams. The growth rates from the Municipal Waste Strategy for West Berkshire (2002) which was the basis for West Berkshire's Integrated Waste Management Contract is considered to be the most relevant for projecting future arisings of this waste stream. In line with national guidance, these projections in the contract considered household and population growth as well as average household size in West Berkshire. The use of actual historic waste arisings data to identify trend lines into the future has also been considered as a potential method for deriving reasonably accurate projected arisings figures.

West Berkshire Waste Management Contract

5.2.3 When forecasting future municipal solid waste arisings, it was considered prudent to review West Berkshire's Integrated Waste Management Contract, signed in 2008**Error! Bookmark not defined.**, as well as the Municipal Waste Strategy for West Berkshire (2002). The Municipal Waste Strategy for West Berkshire set the preferred option for the management of municipal solid waste arisings over the period to 2022. The chosen option for the strategy was to maximise recycling and composting (option 2) acknowledging that this may result in the need for additional waste management capacity to be developed.

5.2.4 In 2003 the authority secured financial support for the development of facilities to maximise recycling and composting. In 2008 an integrated waste management contract was completed, underpinned by the provision of a new waste facility located at Padworth Sidings in West Berkshire. The new waste facility at Padworth, has now been constructed and is operating, incorporating:

- A Materials Recovery Facility (MRF) with capacity of 13,500 tonnes per annum;
- An In Vessel Composting Facility (IVC) with the capacity to process 32,000 tonnes per annum of green waste and kitchen waste;
- A Waste Transfer Station (WTS) with the capacity to handle 42,000 tonnes per annum of residual waste and 7,000 tonnes per annum of glass.;
- A split-level Household Waste Recycling Centre (HWRC), with a capacity to handle just over 7,000 tonnes per annum;

5.2.5 Predictions used for the growth rates within the waste management contract assumed that West Berkshire's population would increase to 155,587 by 2016, with the most significant growth being in the Newbury and Thatcham areas (of approximately 9.6%).

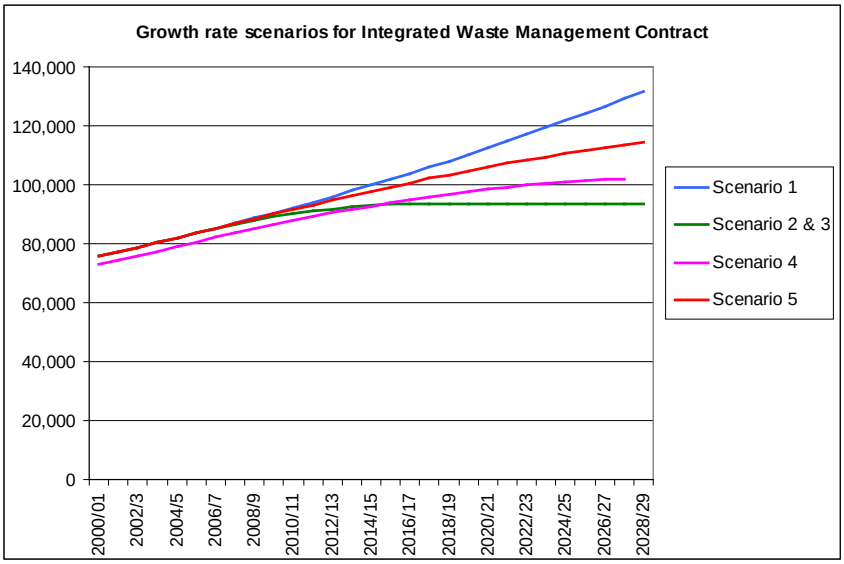
5.2.6 The Municipal Waste Strategy for West Berkshire included five different waste management options that were considered. As part of the evaluation process an assessment of the implications of

potential change in waste arisings was undertaken for each of the different options, which are listed below:

- Scenario 1. The Base Case (i.e. continuation of the existing situation)
- Scenario 2. Maximised Dry Recycling and Composting
- Scenario 3. Maximum energy from waste and sustained dry recycling
- Scenario 4. Highest Level of Sustainability
- Scenario 5. The Balanced Option

The waste arising projections for each scenario are shown in the graph below. The detailed figures for these are available in appendix iii.

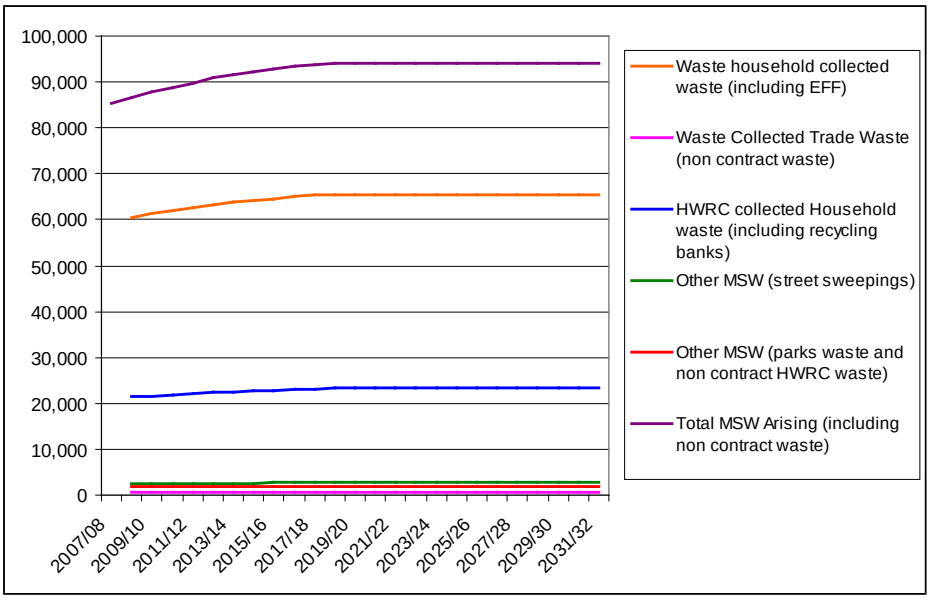
Graph 5.2.1



[42]

5.2.7 When developing an evidence base for waste arisings as part of this LWA, it must be acknowledged that the chosen scenario was scenario 2. The general estimated origins of the waste to be managed as part of scenario 2 was anticipated to be made up of the following waste streams, over the life of the contract. The detailed figures for these are available in appendix iv.

Graph 5.2.2[42]



[42] West Berkshire Council, 2008, Integrated Waste Management Contract

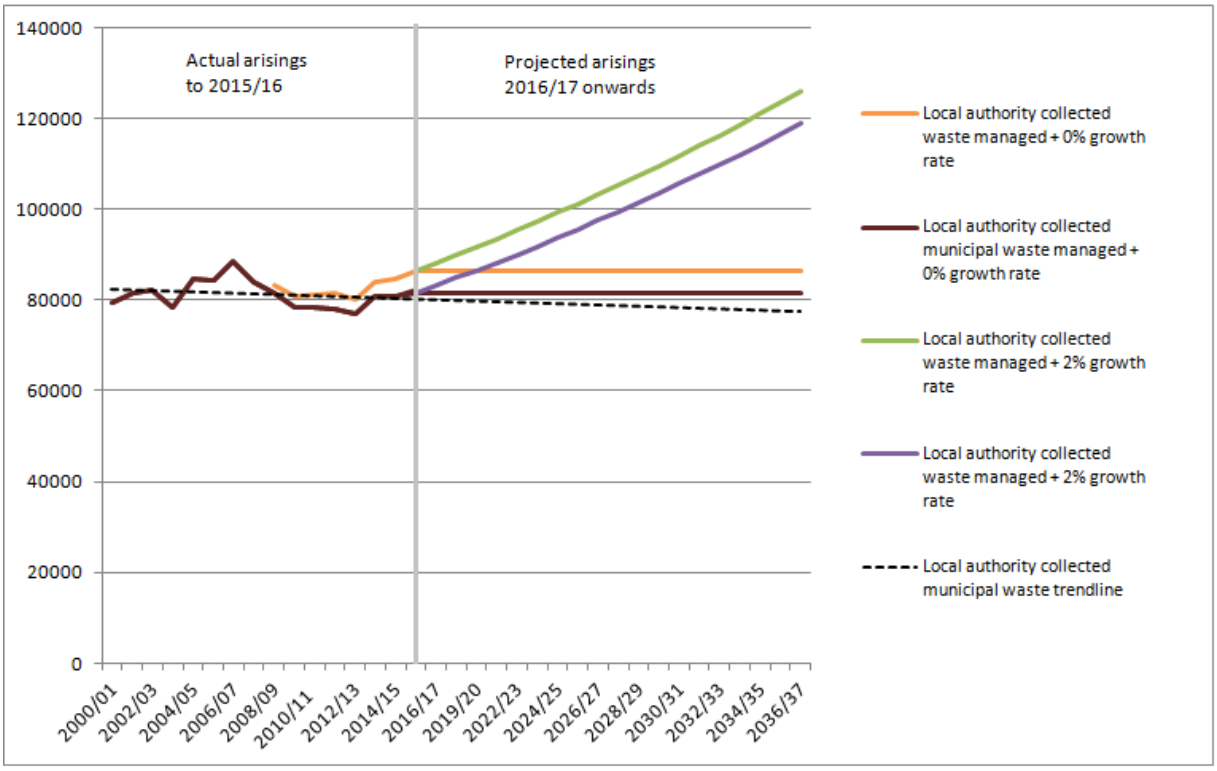
Future plan making tonnages for West Berkshire

5.2.8 To ensure that adequate future capacity and sites are available during the plan period, the above methodologies of calculating the future arisings of this waste stream have been extrapolated to account for more recent actual local authority collected municipal waste figures for 2007/08 through to 2011/12. This shows that significantly less waste has been produced than initially projected. The adjusted figures have been extrapolated to 2036, the projected period of the West Berkshire Minerals and Waste Development Plan.

5.2.9 The following graph therefore projects future arisings of total municipal waste, and local authority collected municipal waste using the following approaches:

- Using the actual waste collected as part of the waste management contract as the base rate (to 2015/16) and projecting future arisings in line with the growth rates used in scenario 2 from the current waste management contract with the figures extrapolated to 2036 (0% growth).
- Using the actual waste collected as part of the waste management contract as the base rate (to 2015/16) and projecting future arisings in line with the growth rates used in scenario 1 from the current waste management contract with the figures extrapolated to 2036 (2% growth)
- Using the actual local authority collected municipal waste arisings between 2000/01 and 2015/16 and applying a trend line to this data

Graph 5.2.3 [43]



5.2.10 When comparing the total municipal waste tonnages derived using the chosen projected growth rates used in the West Berkshire waste management contract and the actual arisings for 2008/09 to

[43] West Berkshire Council, 2008, Integrated Waste Management Contract Scenario 2, actual household waste collected up to 2011/12 with scenario 2 growth rate added from 2012 onwards, actual household waste collected up to 2011/12 with scenario 1 growth rate added from 2012 onwards all projected from 2029/30 to 2035/36 using the growth rates at 2028/29. DEFRA model projected from 2020/21 to 2035/36 using growth rate for 2019/20

2015/16 (table 5.2.1 below), it can be seen that actual arisings have been consistently below the most conservative scenario, which was selected for use in the final adopted contract.

Table 5.2.1

Year	Projected	Actual
2008/09	86,725	83,121
2009/10	87,962	80,639
2010/11	88,907	81,235
2011/12	89,867	81,513
2012/13	90,842	80,106
2013/14	91,501	84,094
2014/15	92,167	84,622
2015/16	92,839	86,399

5.2.11 It can be seen from examination of graph 5.2.3 that the 'Municipal Waste Managed plus 2%' growth rate (Option 1) which is the worst case projection indicates that by 2036 there could be just under 130,000 tonnes of municipal waste arising in West Berkshire that will require management. The 'Municipal Waste Managed plus 0%' growth rate which aligns with Option 2 from the current waste management contract would see the continuation of approximately 86,000 tonnes of municipal waste requiring management annually between 2016/17 and 2036/37.

5.2.12 The data for local authority collected municipal waste runs over a longer period historically (2000/01 to 2015/16) than for municipal waste (2007/08 to 2015/16) and therefore the former was plotted in order to establish a trend line. The trend line is decreasing slightly and when projected forwards it appears to be somewhere just below 80,000 tonnes in 2036. It should be acknowledged that the total municipal waste annually has been shown to be 1,500 to 5000 tonnes higher than the annual local authority collected municipal waste. Therefore taking a worst case scenario, it would be sensible to assume that in line with this trend line the total municipal solid waste requiring management in 2036 would be approximately 85,000 tonnes.

5.2.13 Option 1 in the waste management contract assumed that there would be no reduction in waste arisings in the future. The trends established through available historic data, and the comparison of the projected and actual arisings in table 5.2.1 above appears to indicate that the Option 1 growth rate is potentially unrealistic and too extreme.

5.2.14 However it is considered that this is the most robust approach to be used in predicting future levels of LACW arisings over the plan period and in terms of plan-making looking at a worst case scenario (i.e. the maximum amount of capacity that could be required), within reason, would certainly be preferable to under-estimating required capacity over the plan-period.

5.2.15 The Padworth IWMF, and the Newtown Road HWRC together have 118,000 tonnes of permitted capacity for LACW arising in West Berkshire. Using the 130,000 tonne figure (Option 1 growth rate) this suggests that there is the potential for a small shortfall in capacity to manage these arisings in the final few years of the plan-period in terms of self sufficiency in individual waste streams. However, using historical trend data it is considered much more likely that the level of LACW requiring management by 2036 would be in the region of 80,000 to 90,000 tonnes per annum. It can also be demonstrated that in terms of net self-sufficiency West Berkshire has enough capacity to manage in excess of the equivalent total tonnage of estimated arisings coming from West Berkshire.

Current headroom capacities at the HWRC and IWMF

5.2.16 Since West Berkshire Council acts as the Waste Collection and Disposal Authority for West Berkshire the municipal waste stream is the waste stream where the existing and permitted capacity is known to the authority, as are the contractual arrangements in place for the length of the current contract (which runs until 2032). When considering the waste management capacities at the facilities treating local authority collected municipal waste, it is noted that there is both spare capacity and capacity that is currently used by imported waste. As at 2015/16 this totals 17,287 tonnes at Padworth Sidings, with an additional 7,948 tonnes at Newtown Road. This is detailed in the table below.

Table 5.2.2

Integrated Waste Management Facility total consented capacity including HWRC, in vessel composting facility, waste transfer facility and MRF			95,000 tonnes
Minus	Total West Berkshire local authority collected municipal waste managed at Padworth Sidings		73,753 tonnes
	Of which	Municipal waste through Integrated Waste Management Facility	63,313 tonnes
		Padworth Household Waste Recycling Centre	1,253 tonnes
	Non West Berkshire waste managed at Padworth Sidings		3,960 tonnes
	Total waste managed at Padworth Sidings in 2012/13		77,713 tonnes
Spare capacity at Padworth Sidings against planning consent			**17,287 tonnes**
Newtown Road Household Waste Recycling Facility			23,000 tonnes
Total West Berkshire local authority collected municipal waste managed at Newtown Road			15,052 tonnes
Spare capacity at Newtown Road against planning consent			**7,948 tonnes**
Total available waste management capacity at Padworth Sidings and Newtown Road 20/13			**25,235 tonnes**

[44]

Household Waste Recycling Centre usages

5.2.17 It is understood that, due to the location of the HWRC's within West Berkshire, and the location of HWRC's in adjacent authorities, there was a significant amount of cross boundary use of such facilities. A proportion of residents of Hampshire are understood to have previously used both the Padworth HWRC and the Newtown Road HWRC due to the proximity to the county boundary. Similarly it is known that residents of West Berkshire (particularly inhabitants of the eastern urban areas) utilised the HWRC located at Smallmead in Reading. However during 2016 a permitting system was introduced in West Berkshire which restricted the use of these facilities to West Berkshire residents. Similar permitting systems have been introduced in other surrounding authorities including Hampshire and Reading. This means that the cross boundary movement of waste to HWRCs will likely stop forthwith.

[44] Waste Management team at West Berkshire Council, 15 February 2017

6.1 Commercial and Industrial Waste arisings

6.1.1 Broadly speaking, commercial waste is classified as waste arising from wholesalers, catering establishments, retailers (shops and offices) and public sector activities such as educational establishments while industrial waste is waste arising from factories and industrial plants. As such the commercial and industrial waste steam is generated by a range of different sources from small enterprises employing a small number of people up to multinational corporations.

6.1.2 Due to the lack of central data recording the quantity and composition of this waste stream is less certain than for LACW covered in the preceding section. However, a number of studies and surveys have been undertaken that seek to establish the quantities of commercial and industrial waste arising, where it is arising and how it is being managed.

6.1.3 The Draft Waste Management Plan for England, 2013[45], estimated that, in 2009, of the 47.9 million tonnes of waste generated by businesses, approximately 52% was recycled or reused[46]. This document also suggested that, in 2009, the arisings were roughly split 50:50 between industrial and commercial arisings. The DEFRA survey, that informed the Waste Management Plan for England, indicated that there had been a decline in waste arisings in both the commercial and industrial sectors in recent years. Industrial wastes had declined by 36% since a similar survey in 2002/3, while commercial waste had declined by 21% in the same period (2002/3 to 2009). The DEFRA survey also estimated that 24% of commercial and industrial waste generated in 2009 was sent to landfill. Small enterprises, with fewer than 50 employees, were estimated to have produced 35% of total commercial and industrial waste in 2009. It was also estimated that commercial and industrial waste generation in England had decreased by 29% between 2002/03 and 2009. This is despite a rise in the total business population of 10% over the same period.

Chosen methodology for estimating commercial and industrial wastes arising in West Berkshire

Estimated commercial and industrial waste through Standard Industrial Classification of businesses

6.1.4 In the previous LWA (December 2013), available on the Councils website, consideration was given to the values extracted from the Waste Data Interrogator in order to estimate the quantities of waste managed in West Berkshire, however it is considered that this data is not particularly reliable[47], not least because it would purely be based on operator returns and would not necessarily capture waste that is dealt with under exemptions. However the available data from Waste Data Interrogator and the WBC Waste Planning team has been used in order to provide a crude estimate of Commercial and Industrial arisings on pages 38 and 39 below.

6.1.5 The methodology utilised in the DEFRA Commercial and Industrial Waste Survey 2009, Final Report May 2011[48] provided estimates at an England level of waste arisings by industry sector and company size band and this is considered to be a more reliable dataset on which to base estimated arisings for West Berkshire than the Waste Data Interrogator approach. Business size data has been produced for West Berkshire by the ONS however this is not broken down into industry sectors. Therefore using the national (England) level data, the total estimated tonnage of waste arisings per industry sector has been divided by the number of businesses per industry sector to produce an average quantity of waste produced per business type on a national level in 2009. This average figure has then been multiplied by the number of businesses per industry sector in 2012 and 2016 which provides an estimate of the amount of waste produced by each industry sector for those years.

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[45] https://consult.defra.gov.uk/waste/https-consult-defra-gov-uk-waste

[46] http://webarchive.nationalarchives.gov.uk/20130402151656/http://archive.defra.gov.uk/evidence/statistics/environment/waste/documents/stats-release101216.pdf and https://www.gov.uk/government/publications/commercial-and-industrial-waste-generation-and-management

[47] For more information on why Waste Data Interrogator is considered unreliable for estimating C & I Waste arisings see pages 53-56 of the previous LWA (December 2013)

[48] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/190220/ci-project-report.pdf Table 18.

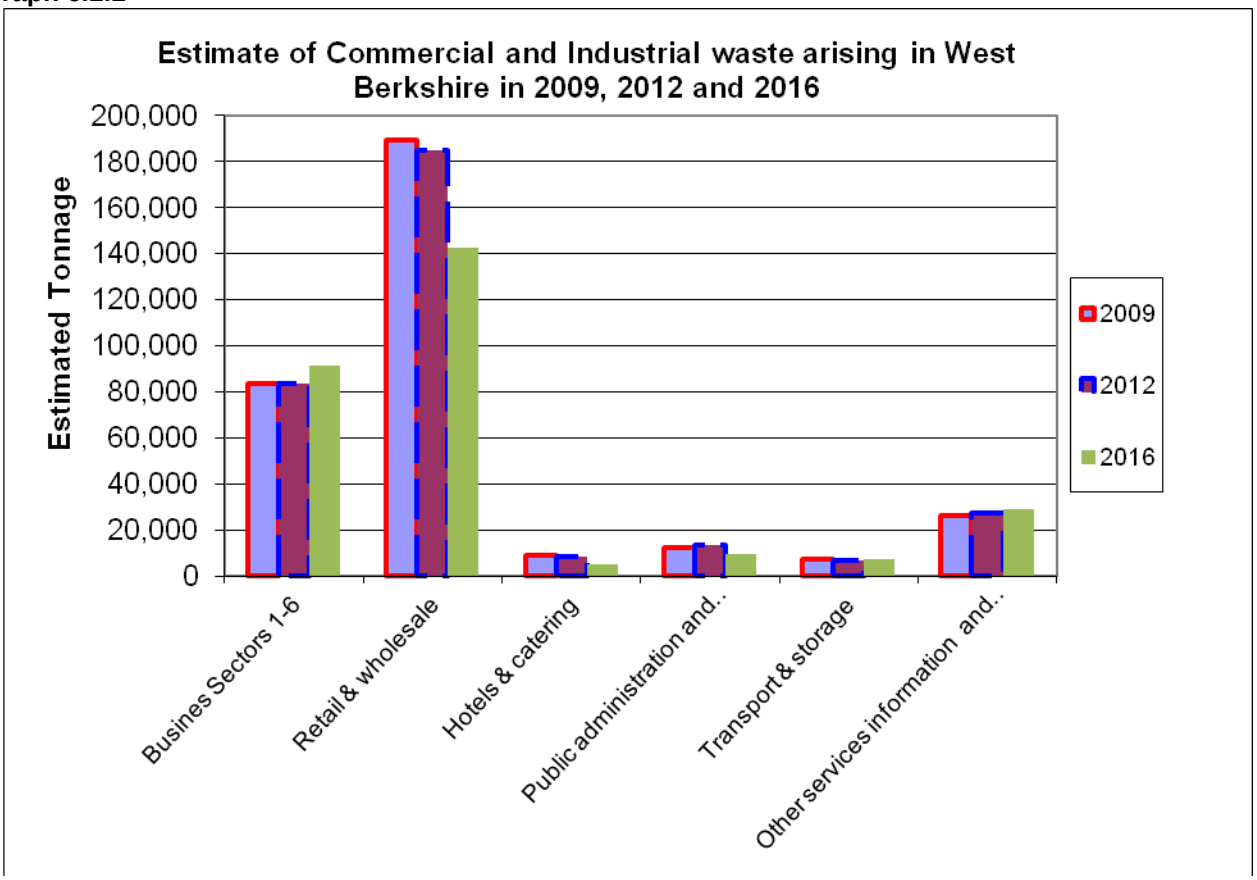
These can then be added together in order to derive an estimate of commercial and industrial waste arisings in West Berkshire for 2012 and 2016.

6.1.6 These calculations have been undertaken for 2009, 2012 and 2016, and this is detailed in table 6.1.1 below. The estimated quantities of commercial and industrial waste arising within West Berkshire in 2009, 2012 and 2016 were 328,386 tonnes, 325,316 tonnes and 285,696 tonnes respectively.

6.1.7 This shows a decline over this period, and considering that the methodology is based on multiplying the number of businesses in a sector by an average tonnage of waste (which has remained unchanged), the reason for this can be broadly apportioned to a decline in the number of businesses in West Berkshire. However, different business sectors produce varying amounts of waste. The average quantity of waste produced annually by businesses in the retail and wholesale sector is approximately 139 tonnes which is second only to the production sector at 176 tonnes. The decline in overall annual tonnages over this period can mostly be attributed to the drop in the number of businesses in the retail and wholesale sector. More details on individual business sectors can be found in graphs 6.1.1 and 6.1.2 and the accompanying text.

Table 6.1.1 From C&I Waste Survey 2009 Table 18				From ONS UK Business Activity, Size and Location 2009 Table A1.1										
					Number of Businesses 2009				Number of Businesses 2012			Number of Businesses 2016		
	Business Sector	**Standard Industrial Classification 2007**	**Commercial and Industrial Waste Arising England (tonnes per annum)**	**Description (Standard Industrial Classification of Economic Activities in brackets)**	**England**	**West Berkshire**	**Commercial and Industrial Waste Arising within West Berkshire in 2009 (tonnes per annum)**	**Commercial and Industrial Waste Arising per business**	**England**	**West Berkshire**	**Commercial and Industrial Waste Arising within West Berkshire in 2012 (tonnes per annum)**	**England**	**West Berkshire**	**Commercial and Industrial Waste Arising within West Berkshire in 2016 (tonnes per annum)**
1	Food, drink & tobacco	10.1 – 12.0	4,666,985											
2	Textiles / wood / paper / publishing	13.1 – 18..2	3,450,362											
3	Power & utilities	19.1 – 19.2 35.1 – 36.0	5,719,551											
4	Chemicals / non-metallic minerals manufacture	20.1 – 23.9	3,847,479											
5	Metal manufacturing	24.1 – 23.9	4,235,420											
6	Machinery & equipment (other manufacture)	26.1 – 33.2	2,164,130	Production (05/39)	136,675	475	83,701	176	128,370	475	83701	125,390	520	91,631
	Retail & wholesale			Motor trades (45)	66,225	255			66,330	270		62,910	235	
				Wholesale (46)	111,340	475			108,845	440		92,075	390	
7		45.1 – 47.9	9,211,893	Retail (47)	245,430	630	189,176	139	240,595	620	185,003	164,825	400	142,577
8	Hotels & catering	55.1 – 56.3	2,670,844	Accommodation & food services (55/56)	146,480	495	9,026	18	139,370	460	8,387	122,375	295	5,379
	Public administration & social work	84.1 – 84.3		Public administration and defence (84)	19,760	45			20,315	55		6,480	40	
9		86.1 – 88.9	2,890,353	Health (86/88)	114,180	295	7,337	22	126,690	325	8,200	99,635	225	5,719
10	Education	85.1 – 85.6	1,480,795	Education	54,435	195	5,305	27	56,555	205	5,577	38,040	145	3,944
11	Transport & storage	49.1 – 53.2	2,188,970	Transport	73,195	250	7,477	30	70,465	235	7,028	81,950	245	7,327
		58.1 – 82.9 90.0 – 96.0		Information & communication	145,060	990			153,575	1,055		191,180	1,130	
				Finance & insurance	58,350	165			56,965	190		46,860	140	
		91		Arts, entertainment, recreation and other services	161,465	800			156,390	740		144,830	665	
		74		Business administration and support services	173,030	825			157,510	765		186,830	735	
		70		Property	80,560	310			80,100	305		80,965	295	
12	Other services information and communication	73	5,401,558	Professional, scientific & technical	303,475	1,410	26,365	6	329,060	1,625	27,420	408,955	2,005	29,119
	Total Waste Arising		**47,928,342**				**328,386**				**325,316**			**285,696**

Graph 6.1.1[49]



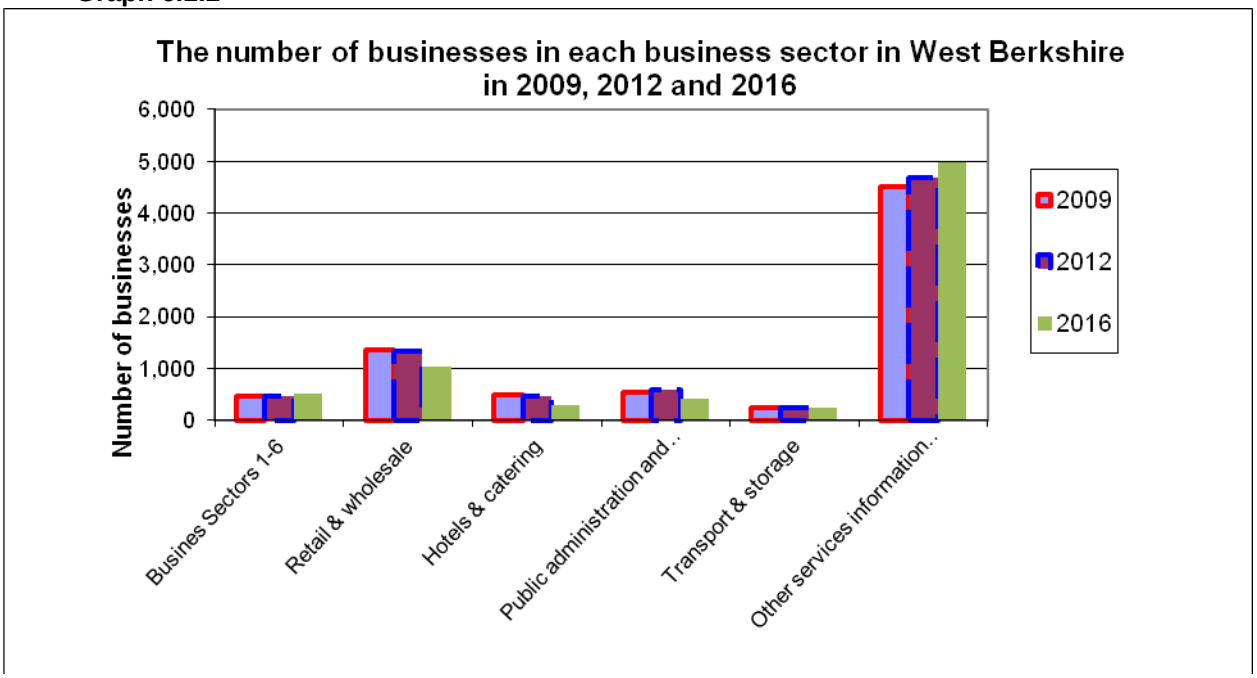
6.1.8 As described above this methodology assumes an average tonnage of waste generated for each business in each sector. In reality businesses of different sizes within the same sector would generate proportionally differing amounts of waste and the specific activities of each business would impact on the volume of waste arisings. As the average tonnages are based on national level data, this approach assumes that the mix of the size of companies present in West Berkshire is the same as that seen at a national level. To derive an estimate for the arisings, per sector, for 2012 and 2016, an assumption has been made that the average tonnage of waste produced per business in the identified business sectors has remained static between 2009 and 2016. These potential weaknesses are acknowledged.

6.1.9 Table 6.1.1 shows that the overall tonnages decreased marginally between 2009 and 2012 and then the decline was more substantial from 2012 to 2016. The above graph 6.1.1 breaks the tonnages down into business sectors, and indicates that in West Berkshire between 2009 and 2016, the contributions from certain sectors have increased, while from others they have decreased. Business sectors 1 – 6 'production', and 'other services, information and communication industry' show an increase, while all other sectors have all shown a decline, with most pronounced being that of the 'retail and wholesale' sector.

6.1.10 The estimated tonnages in graph 6.1.1 above will relate directly to the changes in number of businesses in the specific sectors between the years 2009, 2012 and 2016. The following graph 6.1.2 shows how the number of businesses located in West Berkshire in each sector changed between 2009, 2012 and 2016.

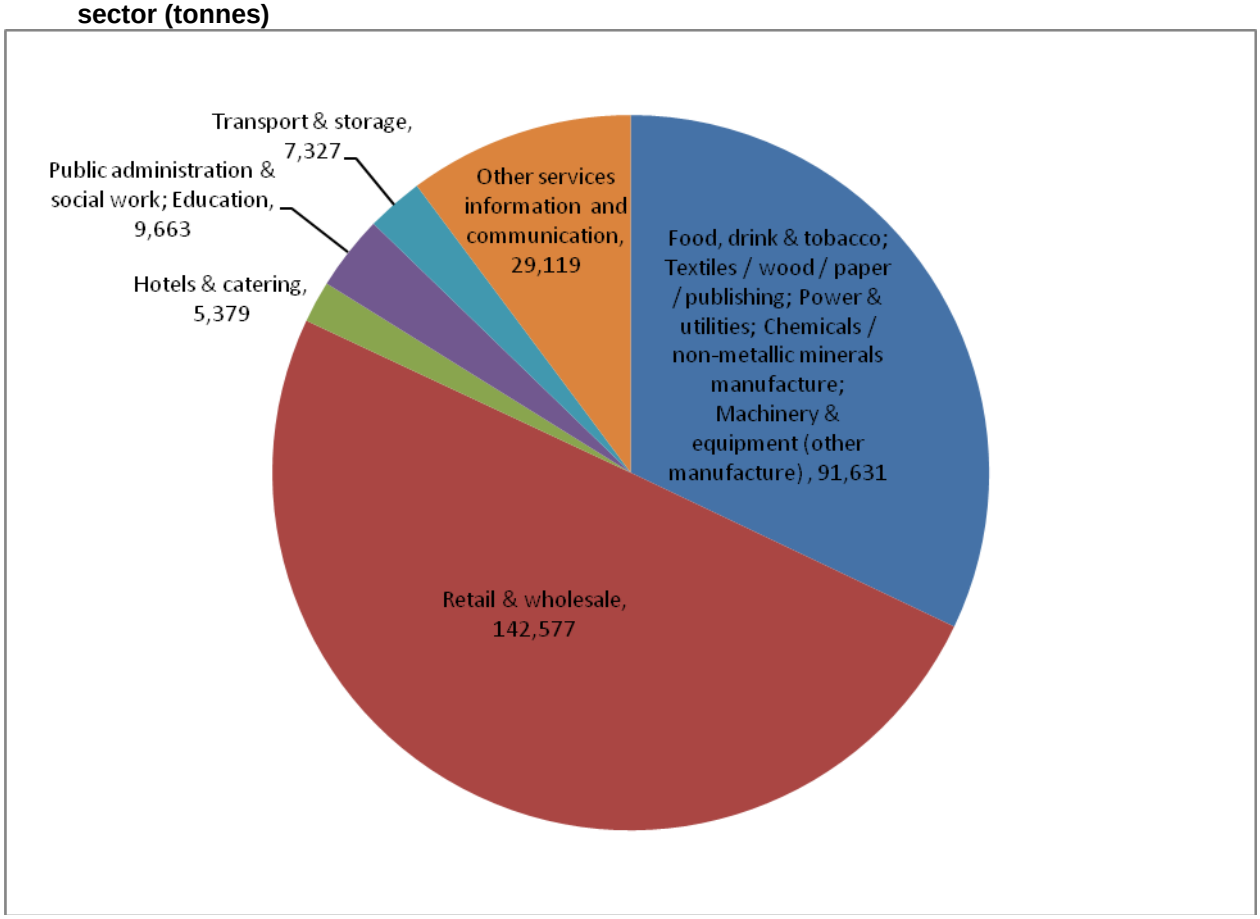
[49] Sectors 1 to 6 are Food, drink & tobacco, Textiles / wood / paper / publishing, Power & utilities, Chemicals / non-metallic minerals manufacture, Metal manufacturing and Machinery & equipment (other manufacture)

Graph 6.1.2



6.1.11 Predictably this graph shows that West Berkshire saw growth in the number of businesses in the 'other services and communication sector' and a small growth in 'business sectors 1 – 6 (production)', which would suggest a growth in waste arisings from these sectors. All other sectors saw a decrease in the number of businesses with again the most significant of these being in the 'retail and wholesale' sector. This would suggest that the quantity of waste arisings from these sectors would have decreased over the period between 2009 and 2016.

Graph 6.1.3 – Commercial and Industrial waste arising in West Berkshire in 2016 by business sector (tonnes)



6.1.12 The pie chart above shows the breakdown of waste arisings by sector for 2016 and indicates that approximately 50% of the commercial and industrial waste estimated to be generated in West Berkshire is via the 'retail and wholesale' sector, while the next largest (in the region of a third of the total) contributor is via the 'production' sector.

Estimated commercial and industrial waste arisings using Waste Data Interrogator

6.1.13 A crude method for estimating commercial and industrial waste arisings for any waste planning authority area is to extract (from Waste Data Interrogator) the quantity of Household, Industrial and Commercial (HIC) waste that is 'received' nationally where the 'origin' of the waste is recorded as being that particular authority area, and then subtracting the amount of municipal solid waste arisings in that same particular authority area. As discussed in the municipal waste section above, the data for the municipal waste stream is widely known at an 'authority area level' based on waste disposal authority areas. West Berkshire Council is both a waste planning authority, and a waste disposal authority. The table below shows the data that has been extracted from the Interrogator together with the amount of municipal solid waste arising in West Berkshire and the derived estimates of commercial and industrial waste arisings.

Table 6.1.2

Year	Waste Data Interrogator HIC Waste	Municipal Solid Waste	Derived Commercial and Industrial Waste Arisings
2010	161,249	81,235	80,014
2011	141,663	81,513	60,150
2012	171,057	80,106	90,951
2013	177,798	84,094	93,704
2014	201,433	84,611	116,811
2015	198,811	86,399	12,412

The data from Waste Data Interrogator is based on calendar year while the municipal waste data is based on financial year, however this is not considered to be a major weakness as the derived estimates are only intended to be indicative.

Chosen baseline for commercial and industrial waste arisings in West Berkshire

6.1.14 It is acknowledged that there are weaknesses with applying the ONS data for the number of businesses in West Berkshire to the figures derived from the DEFRA Commercial and Industrial Waste Survey 2009 Final Report May 2011 (DEFRA method). However, when compared to the figures derived using Waste Data Interrogator and from data that West Berkshire Council holds (WDI method), it can be seen that the figures are quite different.

6.1.15 The most up to date figure available derived using the WDI method is for 2015 and is 112,412 tonnes, while using the DEFRA method, the 2016 figure is 285,696 tonnes. It is acknowledged that these are two different years, however it is certainly indicative of inconsistencies in one of the methods. In terms of directly comparable years, for 2012, the WDI method indicates that arisings were 90,951 tonnes while the DEFRA method is substantially different at 325,316. Due to the reasons outlined already in this assessment and in the previous LWA (December 2013) the figures derived from the Environment Agency Waste Data Interrogator are not considered to be a robust figure for actual commercial and industrial waste arisings.

6.1.16 Deriving local level arising figures via the DEFRA method is not a perfect methodology, however it is considered to be more accurate than the WDI method. The DEFRA method results in a substantially higher figure, and in terms of plan-making looking at a worst case scenario (i.e. the maximum amount of capacity that could be required), within reason, would certainly be preferable to under-estimating required capacity over the plan-period.

6.2 Commercial and Industrial waste arising forecasts

6.2.1 The National Planning Practice Guidance states in Paragraph: 032 (Reference ID: 28-032-20141016; Revision date: 16 10 2014):

Waste planning authorities can prepare growth profiles, similar to municipal waste, to forecast future commercial and industrial waste arisings. In doing so, however, they should:

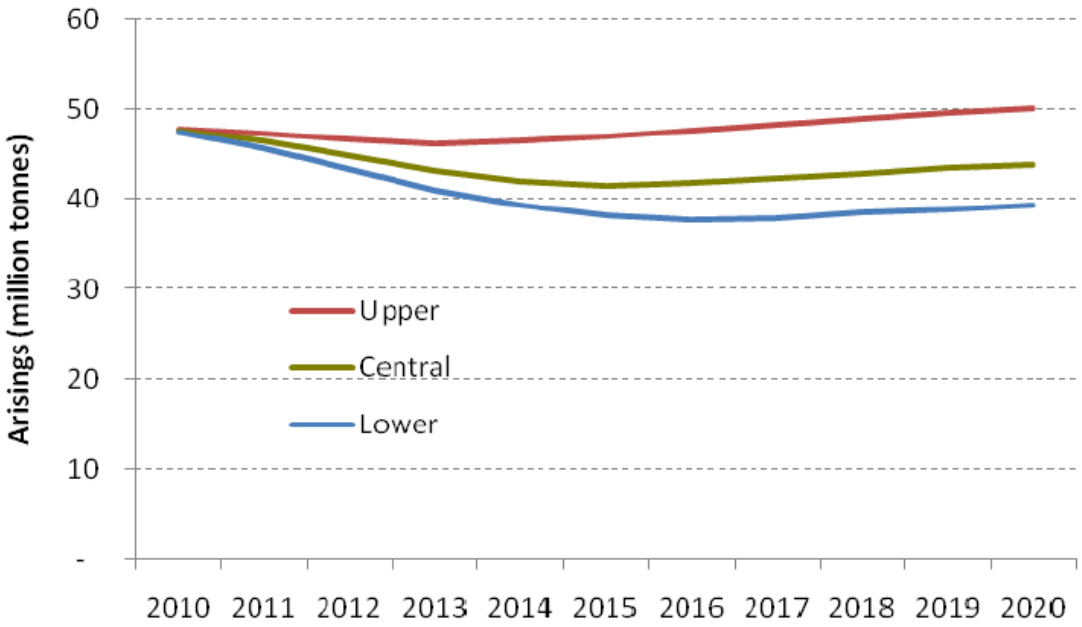
- *set out clear assumptions on which they make their forecast, and if necessary forecast on the basis of different assumptions to provide a range of waste to be managed*
- *be clear on rate of growth in arisings being assumed. Waste planning authorities should assume a certain level of growth in waste arisings unless there is clear evidence to demonstrate otherwise.*

6.2.2 In line with national guidance, growth rates have been applied to a baseline figure in order to project future demand for the management of commercial and industrial waste in West Berkshire throughout the plan-period to 2036. The most accurate baseline figure available is considered to be 285,696 tonnes for 2016. Growth rates from various studies were considered in the preceding Local Waste Assessment (December 2013) and some of these have been applied again using the 2016 arsings figure as the baseline. The following paragraphs explain the growth rates that were chosen for this updated LWA.

DEFRA forecasting model

6.2.3 The DEFRA report entitled "Forecasting 2020 Waste Arisings and Treatment Capacity" published in October 2013 includes forecasts of waste arisings, recycling and landfill diversion[50] for commercial and industrial waste in England. The analysis used in this report seeks to account for the considerable uncertainties that there are about future waste arisings levels, recycling rates and infrastructure development. The report provides a range of forecasts and sensitivity analysis around those forecasts, which are shown in the graph below. The central predictions of the forecasts show commercial and industrial waste arisings falling to 43.9 million tonnes in around 2015, which is lower than the 2009 levels, before beginning to steadily climb.

Graph 6.2.1[51]



6.2.4 Upper, lower and central forecasts for commercial and industrial waste arisings for England have been used by DEFRA to project waste arisings growth in line with the economic growth in the

[50] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/181816/pb13883-forecasting-2020-waste-arisings.pdf

[51] Forecasting 2020 waste arisings and treatment capacity, DEFRA, February 2013

commercial and industrial sectors, by utilising Gross Value Added. Gross Value Added is considered a more complete measure of economic production than employment and is therefore expected to capture changes in waste production more comprehensively.

6.2.5 In order to establish growth rates based on the upper, central and lower waste predictions that could be used at a local level, the overall difference between the values nationally predicted for 2010 and 2020 have been converted into a percentage. This percentage differential has then been applied to the chosen estimated figure for commercial and industrial waste arising within West Berkshire in 2016 (see graph 6.2.3 below).

Chartered Institute of Waste Management (CIWM) growth forecasts

6.2.6 In 2013 the CIWM produced a report that sought to assess the likely future growth of commercial and industrial waste in the UK and Republic of Ireland[52]. The report provides a projection of the level of arisings of commercial and industrial waste arisings to 2020. The estimations within the report have been based on the anticipated changes in employment, by sector, over this period. The baseline year of 2009 was selected as this was the most recent year for which both waste arisings estimates and employment data were available.

6.2.7 By using data on the breakdown of employees by sector from the Business Register Employment Survey 2009[53] the study provided an estimate of the tonnage of waste generated per employee for each sector grouping and then factored in a future growth rate to provide an estimate of the total arisings of waste per sector.

6.2.8 Assumptions are made including that the amount of waste generated by the manufacturing industry will continue to decline (with the decline in indigenous production) but that this will be counteracted by increases in employment in retail and wholesale, and sectors classed as 'other' will counteract this. This results in a prediction that there will be an overall small increase in the tonnage of commercial and industrial waste arising year on year, although the rise is predicted to be less than 1% per annum. The report states that this forecast is a 'high level estimate' and does not take into account the effect of waste prevention measures, increasing resource efficiency and the drive towards a circular economy on the waste produced per employee. This growth rate has also been applied to the chosen baseline 2016 figure.

South East England Partnership Board growth rate

6.2.9 The South East England Partnership Board (wound up in July 2010) updated its regional model for required waste management capacity projections in 2010. The growth rate that was applied in this last update has also been applied to the chosen baseline 2016 figure for estimated waste arisings in West Berkshire. This is plotted below on Graph 6.2.3

Estimated commercial and industrial waste through Standard Industrial Classification of businesses – projected trend line

6.2.10 As is shown in table 6.1.1 above the estimated total commercial and industrial waste arisings figures for West Berkshire are available for 2009, 2012, and 2016 using the DEFRA Standard Industrial Classification methodology. These are shown below with a trendline applied, in order to project the potential trend forward to 2036. This is purely indicative and is unlikely to be accurate.

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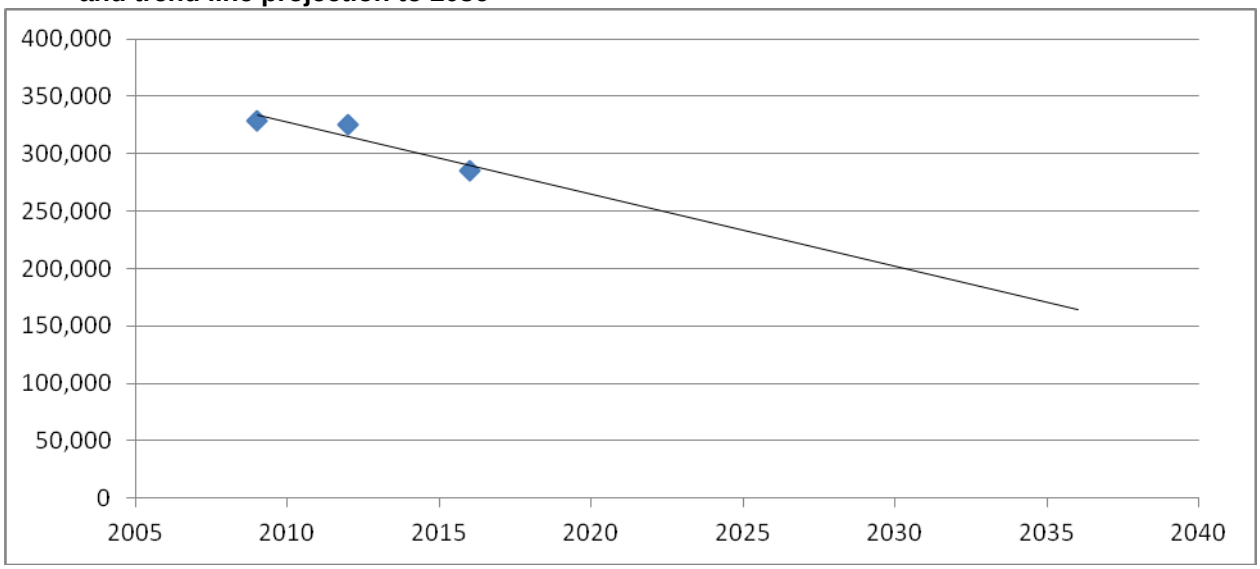
[52] http://www.google.co.uk/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0ahUKEwiwvvzji-_SAhVDJcAKHf-1CkwQFggpMAA&url=http%3A%2F%2Fwww.ciwm.co.uk%2FCustom%2FBSIDocumentSelector%2FPages%2FDocumentViewer.aspx%3Fid%3DQoR7FzWBtisamYEcWSfL6SxAJRLAPT9vf9UOxY7TX%25252bRvV%25252ffsIKIsqU2EtUq%25252bj7oCo87WOf%25252fbs9PqCytSgZ5tfRfy2%25252bBshoiDu7f882AjZtqLLztRjeHBL8ywUdWyhRgk&usg=AFQjCNHxkR3_2Zv525DCWjjY1ve3toQ_sg&sig2=hVsxwPvDcQLO2sQ1cY_H3g&bvm=bv.150729734,d.ZGg

[53] Business Register Employment Survey, 2009, Table 4. Available at http://webarchive.nationalarchives.gov.uk/20160105160709/http://www.ons.gov.uk/ons/rel/bus-register/business-register-employment-survey/2009-revised/index.html

6.2.11 Retail and wholesale accounted for approximately half of the commercial and industrial waste arising in West Berkshire in 2016 (see graph 6.1.3 above), however the amount of retail and wholesale businesses have reduced quite substantially between 2012 and 2016, leading to a decline overall in the estimated airings. This is likely to be due to a change in consumer attitudes, and specifically a growth in online shopping as opposed to actually going to the shops. However, it is considered very unlikely that all shopping would be done online in the future, and there will therefore always be a demand for 'bricks and mortar' in terms of physical shops. For this reason the fall in the amount of 'retail and wholesale' businesses, and (directly linked with this) the fall in the arisings, are likely to plateau at some point rather than continue to fall. As a consequence this projection is not considered appropriate to use. This is plotted below on graph 6.2.2.

Graph 6.2.2 - Estimated commercial and industrial waste arisings for 2009, 2012, and 2016 and trend line projection to 2036



Summary of projected future arisings of commercial and industrial waste in West Berkshire

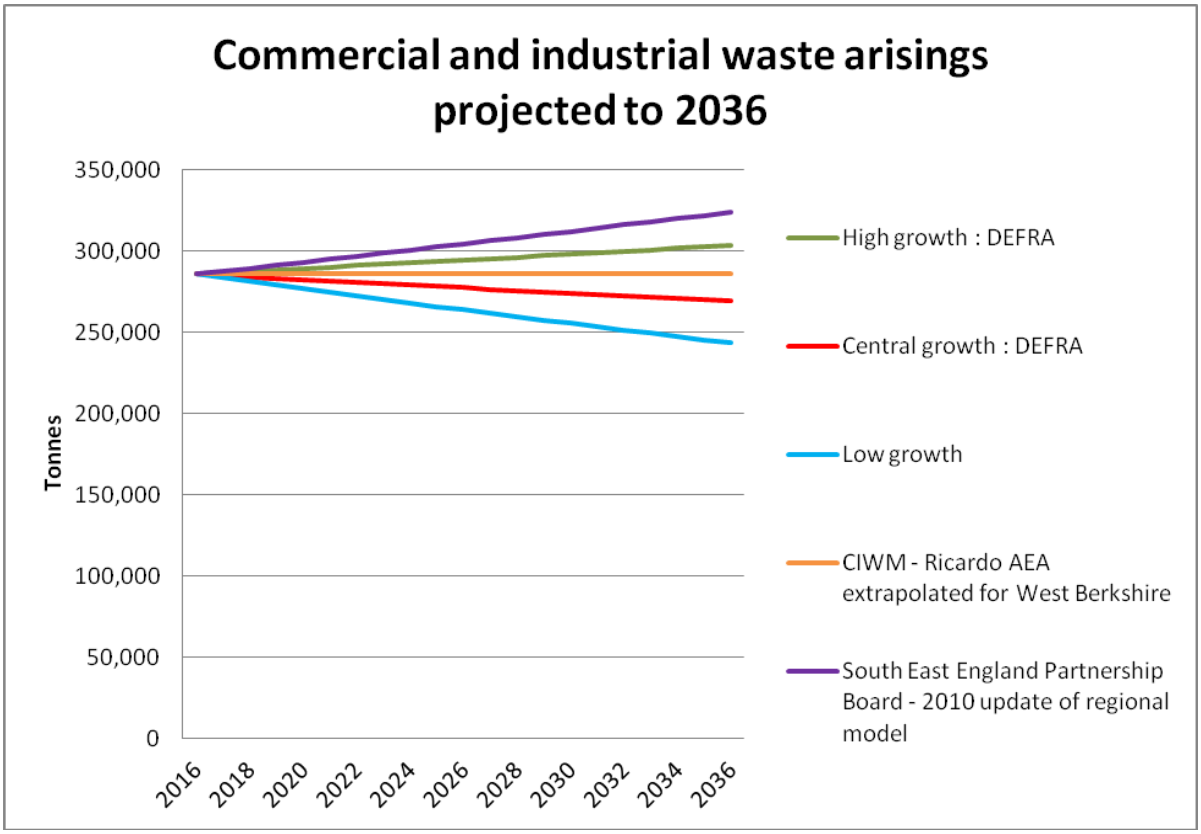
6.2.12 To ensure that adequate future capacity and sites are available for commercial and industrial waste arisings during the plan period, growth rates from the above methodologies have been applied to the 2016 baseline figure of 285,696 to project the arisings to 2036, this being the proposed plan period for the emerging Minerals and Waste Local Plan.

6.2.13 The following graph therefore projects future arisings of commercial and industrial waste using the following approaches:

- Using the high growth rate from the DEFRA forecasting report, with the data extrapolated to 2036.
- Using the central growth rate from the DEFRA forecasting report, with the data extrapolated to 2036.
- Using the low growth rate from the DEFRA forecasting report, with the data extrapolated to 2036.
- Using the growth rate from the CIWM report, with the data extrapolated to 2036.
- Using the growth rate from the South East England Partnership Board regional model.

For the detailed figures for these projections, please view appendix v

Graph 6.2.3[54]



6.2.14 These projections show a differential between the most conservative and worst case figures of approximately 80,000 tonnes. The worst case scenario (i.e. High Growth: DEFRA) yields arisings of approximately 325,000 tonnes per annum by 2036. This is the figure that will be used in order to establish whether there will be adequate capacity over the plan period. However attention should be paid to graph 6.2.2 above which shows a decline in arisings (directly linked to decline in the number of retail/wholesale businesses) over the period between 2012 and 2016 in West Berkshire. It is entirely possible that the total amount of commercial and industrial waste will grow at a lesser or negative rate, and potentially plateau. Although these less extreme scenarios are possible, if West Berkshire has the available capacity to meet what can be considered the worst case scenario over the plan period, this will be a positive outcome.

6.2.15 Although this assessment can try and predict where there may be a shortfall in the future, this does not necessarily mean that sites will come forward or be developed. This will be market-driven but also guided by the planning process. The viability of a waste site will depend primarily on the availability of enough waste in close proximity, although there are certainly other factors that will affect viability. The planning process is here to locate development in suitable locations, so this will also have an impact on the delivery of waste sites.

[54] https://www.gov.uk/government/publications/forecasting-2020-waste-arisings-and-treatment-capacity, Forecasting 2020 waste arisings and treatment capacity, DEFRA, February 2013 and Regional waste management capacity: survey, methodology and monitoring, SEERA and ERM. March 2007
DEFRA, ADAS and CIWM projected from 2020 to 2036 using the growth rates at 2020. SEERA/ERM model projected from 2025 to 2036 using growth rate for 2025

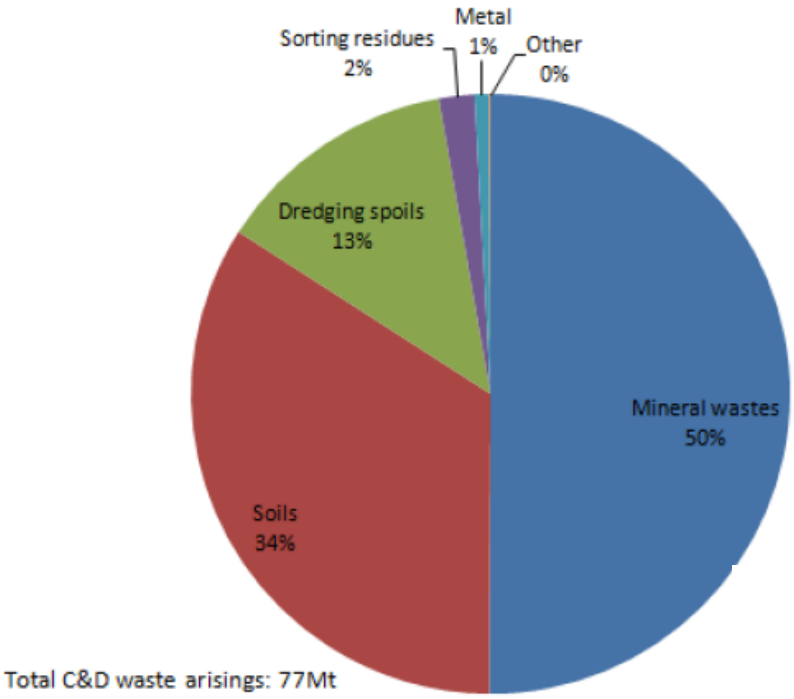
7.1 Construction, Demolition and Excavation Waste arisings

Introduction

7.1.1 In general, construction, demolition and excavation wastes are produced from civil engineering activities, from demolition of existing buildings/structures, or from construction of new buildings and structures. The construction, demolition and excavation waste stream is understood to be the largest contributing sector to the total quantity of waste generated in England. As with commercial and industrial waste, the data on construction, demolition and excavation wastes is very limited, and is generally only reported at a national level.

7.1.2 The Waste Management Plan for England, 2013, estimates that 77.4 million tonnes of construction and demolition waste was generated in England in 2010, which was a reduction from the 81.4 million tonnes estimated to have been generated in 2008. The Waste Management Plan for England also states that England is already exceeding the revised Waste Framework directive target for recovering construction and demolition waste. The pie chart below, taken from the Waste Management Plan for England, shows the estimated composition for construction, demolition and excavation wastes in England for 2009.

Graph 7.1.1[55]



Estimating construction, demolition and excavation waste arisings in West Berkshire

7.1.3 In March 2012, DEFRA published a new methodology[56] that can be used for estimating total construction and demolition waste generation, which was developed in partnership with other

[55] Waste Management Plan for England, 2013, https://consult.defra.gov.uk/waste/https-consult-defra-gov-uk-waste

[56] Methodology for Estimating Annual Waste Generation from the Construction, Demolition and Excavation Sectors in England, March 2012, DEFRA https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/119680/CDE-generation-methodology.pdf

agencies and industry bodies and used only existing data sources. When it is used at a national level it produces figures that are similar to the construction and demolition waste estimates to the WRAP surveys for England for 2009 and 2010, which were in the region of 47,500,000 tonnes, a decrease of approximately 18% from 2008[57].

7.1.4 In essence the DEFRA methodology uses four data sources (waste dealt via transfer and treatment facilities, waste sent to landfill sites, waste disposed of under exemptions, and waste recycled as aggregate) to provide an estimate of total waste arisings using the following calculation:

> *CDE waste arisings = (Inputs to transfer and treatment facilities minus the outputs from transfer and treatment facilities) plus the quantity landfilled, the quantity dealt with under exemptions and the quantity recycled as aggregate.*

7.1.5 An attempt has been made to apply this methodology to West Berkshire using available data sources or, where necessary, estimating West Berkshire as a proportion of the DEFRA derived values for England.

7.1.6 The calculations are shown in the following table 7.1.1, which indicates that in 2015, some 360,114 tonnes of construction, demolition and excavation waste arose in West Berkshire. The same methodology was used for 2010, 2013, and 2014, yielding 248,853, 351,308 and 322,831 tonnes respectively. It can be seen that the estimates for 2013, 2014 and 2015 are all within the same approximate region.

7.1.7 In terms of weaknesses in the adapted DEFRA model, it is recognised that there is scope for double counting between the CDE waste managed via 'transfer, treatment, MRS' facilities, and that which is turned into 'recycled aggregate'. It is also the case that the estimated exemptions figure which has been used for 2013, 2014 and 2015 has been derived from 2010 data.

7.1.8 The majority of the data has been extracted from the EA WDI, and it is acknowledged that there are issues with the reliability of this data. For example two of the larger CDE waste processing facilities in West Berkshire, are omitted from WDI and in planning terms these facilities would be considered to process CDE waste. The potential for double counting has been highlighted as a weakness, however some double counting may compensate for the tonnages processed at the omitted sites.

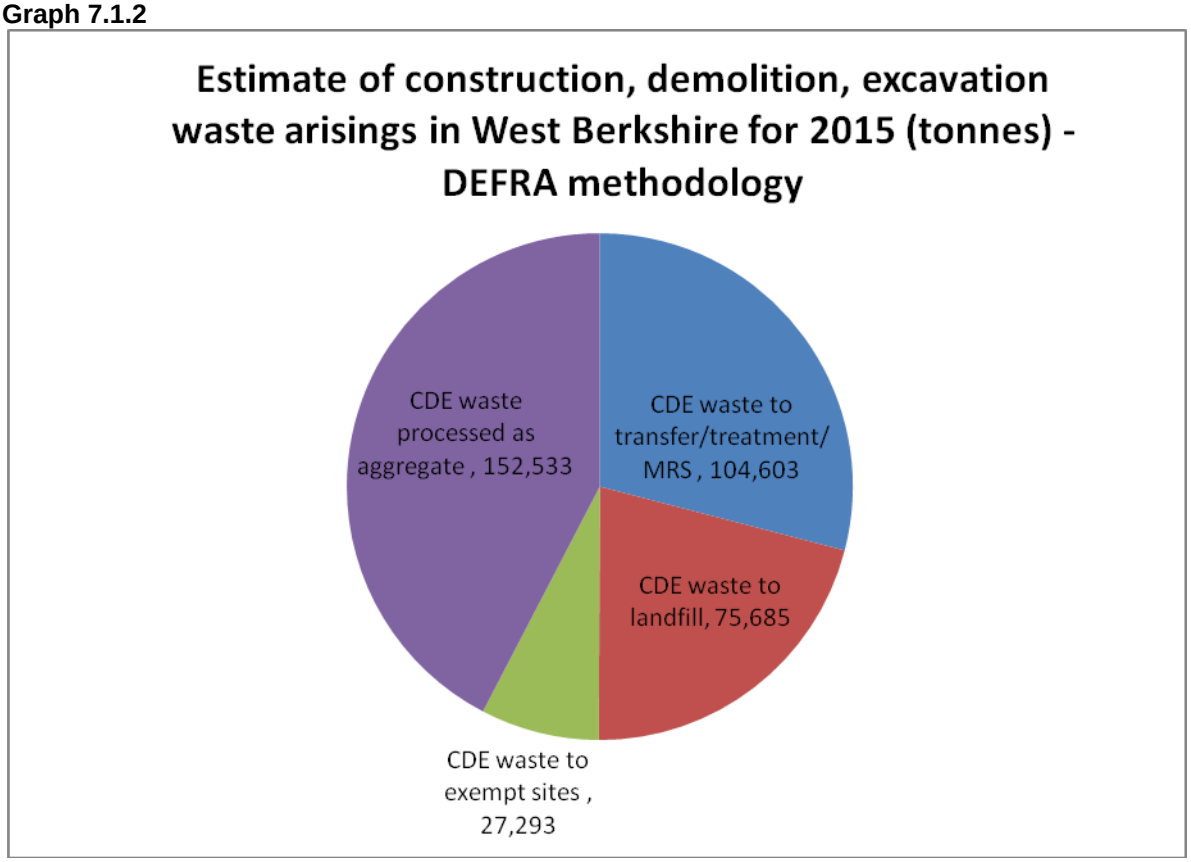
[57] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/142006/CDE-generation-estimates.xls

Table 7.1.1	England 2010			West Berks 2015	DEFRA comments on methodology	
WASTE AT TRANSFER/TREATMENT FACILITIES:	**C&D ESTIMATES:**	**E ESTIMATES:**	**CD&E ESTIMATES:**		*SEPA-based methods*	*WBC - source / adapted method / comments*
Total input into transfer/treatment/MRS	15,971,362	5,684,704		155,963	(Chapt 17, and parts of 21, 22, 24, 26)	WDI 2015 - Only chapter 17 figure used (waste received minus waste removed) as impossible to decipher parts of other chapters with any degree of accuracy
Total output from transfer/treatment/MRS	8,768,658	5,711,398		51,360	(Chapt 17, and parts of 21, 22, 24, 26)	
Difference (inputs-outputs):	***7,202,705***	***0***	***7,202,705***	***104,603***	*Note: difference in E waste is negative (more E waste sent out than received), therefore difference adjusted to zero*	
WASTE AT LANDFILL SITES:					*SCTG methods*	
Total sent to landfill	2,454,800	14,501,192	16,955,992	55,493	(Chapt 17, and parts of 21, 22, 24, 26)	WDI 2015 - Only chapter 17 figure used as impossible to decipher parts of other chapters - landfilled ch17 waste 'received' where origin is West Berks
Chapter 19 waste sent to landfill (from known CD activities)	1,195,812	0		0		Impossible to determine this through WDI or other available data sources
Chapter 19 waste sent to landfill (not known whether from CD activities)	8,927,415	0		43,962	**if the total waste sent to transfer/treatment/MRS = 84,529,300*	WDI 2015 - Chapter 19 figure used - landfilled ch19 waste 'received' where origin is West Berks
Assumed proportion of A9 that is from CDE activities (from A9)*	*1,686,788*	0		*20,192 (155,963 / 339,570 * 43,962)*	*if C&D waste sent to transfer/treatment/MRS = 15,971,362*	*WDI 2015 - Total ch17 input to Transfer /treatment / MRS as a proportion of total waste input to Transfer / treatment / MRS * Total Ch19 waste received at landfill where origin is West Berks*
Total Chapter 19 C&D waste sent to landfill	*2,882,599*	0		*20,192 (20,192 + 0)*	*then x% of waste sent to transfer/treatment is C&D waste =18.9*	WDI 2015 - Chapter 19 waste sent to landfill (from known CD activities) (zero/unknown) plus Assumed figure for proportion of ch19 that is cde (20,192 tonnes)
Total landfilled:	***5,337,399***	***14,501,192***	***19,838,591***	***75,685 (55,493 +20,192)***		WDI 2015 - Ch17 figure landfilled plus derived figure for ch19 cde waste sent to landfill
EXEMPTIONS (should include Para 19 & 9, U1 exemptions, Standard Permits and CL:AIRE)**:**	*0*	8,150,134			*WRAP 2008 survey data* (adjusted by change in construction output)	Calculated as England value x (Construction GVA [Gross Value Added] 2010 of £1,285 million for Berkshire / Construction GVA 2010 of £70,416 million for England) x (2011 projection of 94,269 for Jobs in West Berkshire / 512,922 for Jobs in Berkshire) i.e. x 0.0182 x 0.184.
Total exemptions:	***0***	***8,150,134***	***8,150,134***	***27,293***	All exemptions likely to be soil & stones (E waste)	
AGGREGATE PRODUCED:					*MPA 2009 data (thought to be very little change between 2009 and 2010)*	
MPA estimates of recycled agg produced from C&D sector	34,816,000	N/A			MPA figure (- includes very little soil & stones from excavation)	
Estimates of recycled soils produced from E sector	N/A	7,368,000			Recycled/screened soils estimated based on ratio of recycled agg : recycled soils (from WRAP 2008 survey)	
MPA estimates of total recycled agg:	***34,816,000***	***7,368,000***	***42,184,000***	***152,533***	*Note: C&D tonnage appears high as much of this is processed and often reused on site, but as it had had some form of treatment prior to use, it has been counted as waste here*	WBC Minerals and Waste Team – Inert waste arising in West Berks processed into recycled aggregate material in West Berks - Based on 2015 operator returns for waste sites/recycled aggregate producers
TOTAL ARISINGS:						
C&D to waste transfer/treatment =	7,202,705	0	7,202,705	104,603		
C&D to landfill =	5,337,399	14,501,192	19,838,591	75,685		
C&D to exempt sites =	0	8,150,134	8,150,134	27,293		
C&D aggregate =	34,816,000	7,368,000	42,184,000	152,533		
TOTAL C&D WASTE ARISINGS	***47,356,104***	***30,019,326***	***77,375,430***	***360,114***		

[58]

[58] Table adapted from DEFRA (March 2012) Construction, Demolition and Excavation waste generation estimate: England, 2008 to 2010 https://www.gov.uk/government/statistics/construction-and-demolition-waste

Graph 7.1.2



7.1.9 The above graph indicates that a significant proportion (42%) of CDE waste arising in West Berkshire is used to produce recycled aggregate. There is clearly crossover with the CDE waste sent to transfer / treatment / MRS facilities, and these account for the next biggest proportion of where CDE waste arisings are dealt with, with CDE waste also sent to landfill, and sites covered by EA exemptions.

Environment Agency Waste Data Interrogator

7.1.10 It is acknowledged that the figures for CDE arisings derived from the DEFRA methodology are not directly comparable to the figures extracted from the relevant version (year) of the EA WDI (inert waste 'received' where the origin is identified as being West Berkshire). It is considered that this is due, in part, to the DEFRA methodology including an estimate of the material that is crushed and re-used on development sites with EA exemptions in place, and this would not be captured by the WDI. It is also acknowledged that some CDE waste will not be inert.

7.1.11 However, for indicative and sense checking purposes these two figures have been compared for available years in table 7.1.2 below. It is considered that in theory the discrepancy between these figures should not be as large and this would suggest inadequacies in either the model or the EA WDI. It is considered likely that due to the known reliability issues with the EA WDI and the reasons outlined above, the derived figures from the DEFRA model would be a more reliable basis for plan-making. The fact that the WDI figures for 'inert' are consistently less that the DEFRA derived figure is also considered positive in terms of the accuracy of the DEFRA derived figure (i.e. it is logical that the WDI figure would be less as it is expected that this dataset would not be all-encompassing for the reasons stated).

Table 7.1.2

Year	DEFRA Model method – CDE arisings	EA WDI Inert waste arisings
2010	248,853	84,479
2013	351,308	231,695
2014	322,831	187,115
2015	360,114	248,042

Environment Agency Waste Exemptions study for the South East

7.1.12 The Environment Agency Waste Exemptions study for the South East[59] report was published in 2010. This was a desk based study that sought to provide an understanding of the quantities of construction, demolition and excavation waste managed at sites exempt from the environmental permitting regime, and therefore the study sought to fill the data gaps of waste types and corresponding tonnages for such exempt sites. The report focused on the main Environment Agency regulated exemptions which relate to construction, demolition and excavation wastes, which were listed as:

- Simple exemption 13 (manufacture of construction products, soil and aggregate),
- Complex exemption 9 (reclamation, restoration and improvement of land), and
- Complex exemption 19 (waste for construction).

7.1.13 The report methodology gathered data directly from sites, via operators, with assumptions applied to project a range of estimated annual site throughputs for the south east region. Reliability analysis concluded that the derived figures from the paragraph 13 exemptions had the lowest level of reliability and in most cases actual data was very limited. As such the overall level of reliability that can be placed on these figures is very limited.

7.1.14 The estimated figures for the south east were split down to waste planning authority areas within the South East, which provided an estimate of how much waste the exempt sites in West Berkshire were likely to produce. This is shown in the following table:

Table 7.1.3

Waste Planning Area	Number of sites	Lower boundary limit and Upper boundary limit			
		Total tonnage for 2008/09	Exemption paragraph number		
			9[60] (tonnes)	13[61] (tonnes)	19[62] (tonnes)
West Berkshire	18	504,000 to 558,000	35,000 to 63,000	384,000 to 384,000	85,000 to 110,000
South East	361	9,978,000 to 11,741,000	639,000 to 1,129,000	7,644,000 to 7,644,000	1,695,000 to 2,969,000

7.1.15 The majority of this data was based upon a range of assumptions, detailed within the report itself, but as described above, the level of reliability on the derived quantities of material utilised at such exempt sites is limited.

7.1.16 It is acknowledged that this data was compiled for 2008/09 and the DEFRA derived exemptions figure above was for 2010, however it is useful in indicative terms to compare the figures. The EA

[59] Environment Agency Waste Exemptions desktop study – construction, demolition and excavation wastes. Waste exemptions desktop study for the South East, Jacobs, March 2010

[60] New limit for exemptions is generally 5,000 tonnes per 3 years, with the exception of those uses which now fall under standard rules permits. The previous limit was 20,000 tonnes per hectare.

[61] A threshold of 42,666 tonnes per annum (using threshold of 26,000 tonnes per annum for treatment of waste wood and waste plant matter by chipping, shredding, cutting or pulverising and a threshold of 16,666 tonnes per annum for screening and blending of waste, with the exception of those uses which now fall under standard rules permits.

[62] The new limit s for exemptions are generally 1,000 tonnes and 5,000 tonnes per 3 year registration and 50,000 tonnes for road construction only. These were previously unlimited.

study concluded that the estimated West Berkshire arisings used at 18 registered exempt sites within West Berkshire were between 504,000 and 558,000 tonnes which is far in excess of the DEFRA derived figure of 27,293 tonnes. The majority of the 18 sites in West Berkshire fell under paragraph 19 exemptions, however some of these have now closed, and it can be seen in table 7.1.3 that the largest estimated tonnage was attributable to paragraph 13 sites, the data for which has been stated as having a very low level of confidence.

7.1.17 Sites where crushing and screening are undertaken require permits from Environmental Health within WBC, and as at December 2015, there were only two permitted sites and neither of these were on the listthat was provided as part of the EA Waste exemptions study.

Chosen baseline figure for CDE arisings

7.1.18 The estimated figure of 360,114 tonnes of CDE waste arisings in 2015 derived using the adapted DEFRA model encompasses CDE waste managed through 'transfer / treatment / MRS facilities', CDE waste deposited in 'landfill sites', CDE waste utilised under EA exemptions; and CDE waste utilised in the production of recycled aggregate material. The weaknesses of the approach have been documented in paragraphs 7.1.7 and 7.1.8 above, however despite these weaknesses this baseline figure is considered to be the most accurate available.

7.2 Construction, demolition and excavation waste forecasted arisings

7.2.1 The National Planning Practice Guidance states in paragraph 033 (Reference ID:28-033-20141016) states:

Waste planning authorities should start from the basis that net arisings of construction and demolition waste will remain constant over time as there is likely to be a reduced evidence base on which forward projections can be based for construction and demolition wastes. However, when forecasting construction and demolition waste arisings, the following may be relevant:

- *annual existing returns from waste management facilities*
- *data from site waste management plans (where available)*
- *the fact that a sizeable proportion of construction and demolition waste arisings are managed or re-used on-site, or exempt sites, so it is critical that some provision is made for unseen capacity in this way*
- *significant planned regeneration or major infrastructure projects over the timescale of the Plan.*

7.2.2 As described above, the estimated figure of 360,114 tonnes has been chosen to use as the baseline for CDE waste arisings in 2015. This was derived using the adapted DEFRA model. In line with national guidance, this level of arisings has been projected forward to 2036 using a 0% growth rate. Graph 7.2.1 below shows the projected level of demand for CDE waste management capacity for the duration of the plan period for West Berkshire.

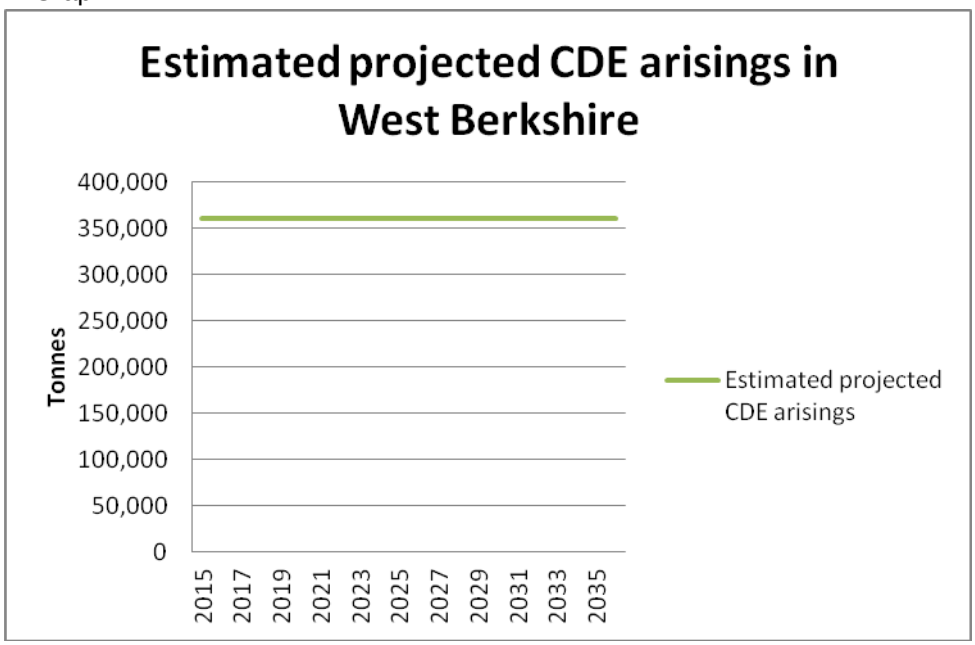
7.2.3 West Berkshire Council currently has throughput data for the waste sites in West Berkshire for 2013, 2014, and 2015. These returns have been utilised in conjunction with the annual recycled aggregate producer returns data to calculate the level of 'CDE waste arising in West Berkshire used to produce recycled aggregate' component of the adapted DEFRA calculation.

7.2.4 Arisings from sites which are exempt in term of an Environment Agency permit are taken into account in the adapted DEFRA model, although it is acknowledged that this figure may not be accurate.

7.2.5 Two projects which are likely to result in more CDE waste being managed on a temporary basis in West Berkshire are the development of both the M4 Smart motorway system, part of which passes through West Berkshire, and Crossrail, the most western station being Reading which is a neighbouring authority. However these are not considered likely to be a significant issue in term of the waste arisings during the plan period.

7.2.6 As confirmed above the adopted West Berkshire Core Strategy contains proposals for the delivery of at least 10,500 homes over the plan period (2006 – 2026) at a rate of 525 net additional dwellings per annum. Subsequent to the adoption of the Core Strategy the six Berkshire unitary authorities, together with the Thames Valley Berkshire Local Enterprise Partnership (LEP), commissioned the preparation of a Strategic Housing Market Assessment (SHMA) for the relevant housing market areas. The conclusions show West Berkshire to be located within a housing market area (HMA) that also includes Reading, Wokingham and Bracknell Forest. The overall Objectively Assessed Need (OAN) was assessed as 665 dwellings per annum over the period 2013 - 2036. The SHMA itself however, does not set a new housing target, as this will be set through the new Local Plan. The building of these houses to meet this need would generate CDE waste and this would need to be managed. In theory the generation of CDE waste from house building in West Berkshire would have been captured by the EA WDI for 2015 and this data would then have been used in the adapted DEFRA model calculation for the baseline, and then projected forward to 2036. The waste generated from this level of development on an annual basis is unlikely to influence waste arisings to such a level that it would influence plan-making.

Graph 7.2.1



Sites in West Berkshire consented to manage construction, demolition and excavation wastes

7.2.7 As set out earlier in section 4 of the LWA there are a number of existing sites that manage CDE waste in West Berkshire. Waste site monitoring is undertaken annually by WBC in order to collect information for policy-making. Data collected includes waste throughputs, a breakdown of the types of waste managed, and a breakdown in terms of whether waste is from West Berkshire or 'imported'.

7.2.8 In West Berkshire between 2013 and 2015 inclusive there have been between 11 and 12 sites that have had planning permission, and managed CDE waste. These include inert landfill sites, CDE waste recycling facilities (some of which are associated with infilling of mineral voids), and waste transfer/recycling facilities. Of the 12 sites in 2015, (excluding landfill sites) 4 were operating under temporary consents – 1 of these has since closed, 1 has been replaced with a new permanent facility on an alternative site, 1 is due to be removed at the end of 2018, and 1 is due to close at the end of 2019. This is in addition to 4 inert landfill sites which inherently operate under temporary consents, three of which are nearing completion at the time of writing this assessment.

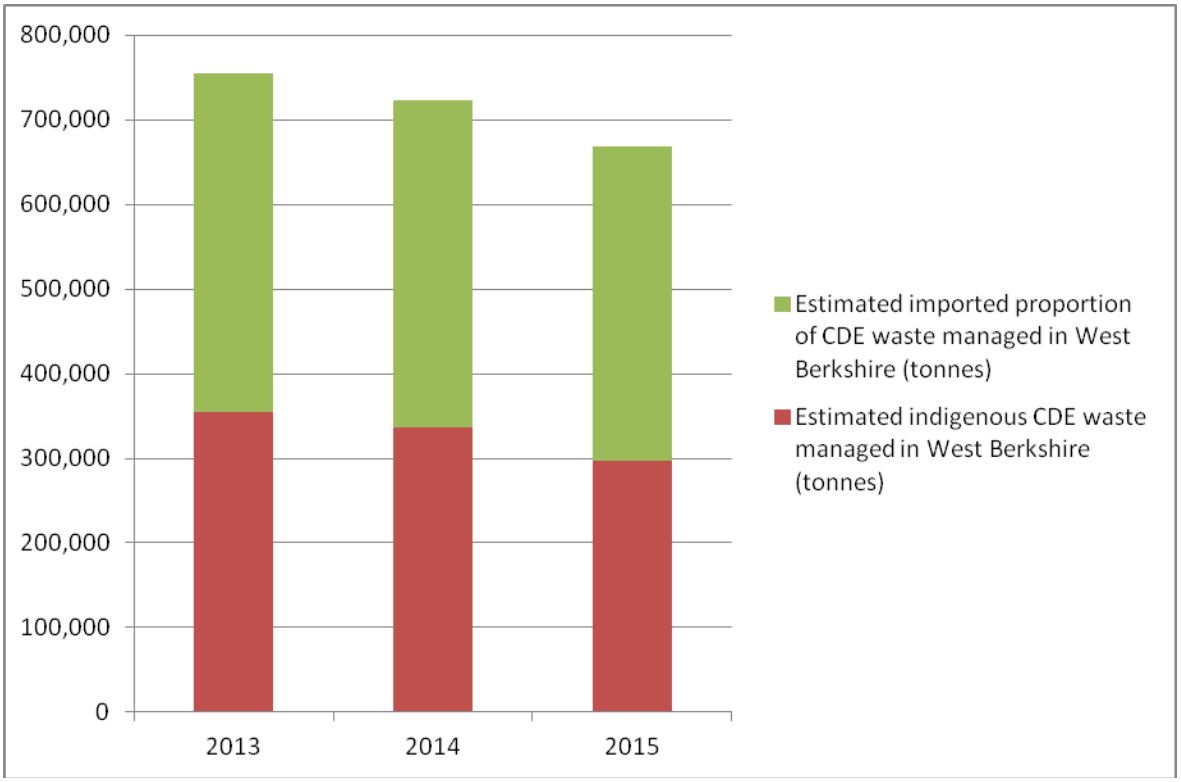
7.2.9 As part of the development of the WBMWLP, sites are being allocated for minerals development, and this will potentially involve the infilling of mineral voids with inert fill material. It is estimated that these allocated sites could result in an additional 1.96 million m^3 of inert landfill capacity created over the

plan period where consent is granted at the proposed allocated mineral sites and the mineral is extracted.

7.2.10 It is considered likely that proposals for inert waste processing facilities could come forward in association with applications for mineral extraction. These applications would have to satisfy the requirements of the development plan, and all other material considerations, however if this could be achieved, these sites would replace the existing temporary facilities in terms of providing future capacity. It is also likely that a policy approach will be adopted whereby there would be a presumption in favour of new waste development on existing, permanent waste sites. Additionally it is known that there is existing spare capacity at some of the permanent CDE waste management facilities in West Berkshire.

7.2.11 Graph 7.2.2 below shows the high proportion of CDE waste that is imported to West Berkshire for management. In 2013, 2014 and 2015 it is estimated that in excess of 50% of the CDE waste managed at consented sites was imported from outside West Berkshire (based on data obtained directly from operators).

Graph 7.2.2 – Construction, Demolition and Excavation Waste managed in West Berkshire



7.2.12 Table 7.2.1 below compares the estimated CDE arisings using the adapted DEFRA model in 2013, 2014 and 2015 to the estimated indigenous CDE waste managed within consented sites in West Berkshire. It is acknowledged that there is a disparity of approximately 60,000 tonnes in 2015, however as can be seen, the comparative figures for each year are within the same 'ball park'. The total estimated CDE waste managed within West Berkshire has been between 600,000 and 800,000 during the years 2013 to 2015, and therefore a difference of 60,000 is not thought to show a significant inconsistency. It is logical that the majority of indigenous CDE arisings would be managed within West Berkshire due to the apparent provision of operational capacity.

7.2.13 There is a reasonably high degree of confidence in the data derived from operator returns, and therefore the results of this comparison are generally seen as positive in terms of assessing the level of confidence in the adapted DEFRA model method

Table 7.2.1

Year	DEFRA Model method – CDE arisings (tonnes)	Estimated indigenous CDE waste managed in West Berks based on operator returns (tonnes)
2013	351,308	354,709
2014	322,831	336,625
2015	360,114	297,359

Conclusion for construction, demolition and excavation waste in West Berkshire

7.2.14 The assessments carried out in this LWA suggest that the quantity of CDE wastes being managed in West Berkshire is greater than that of local authority collected municipal waste and commercial and industrial waste. Using site operator returns data it is also apparent that the quantity of CDE wastes managed in West Berkshire is likely to far exceed the quantity of CDE wastes that arises in West Berkshire.

7.2.15 The adapted DEFRA methodology indicates that in 2015, some 360,114 tonnes of CDE waste arose in West Berkshire. The same methodology was used for 2010, 2013, and 2014, yielding 248,853, 351,308 and 322,831 tonnes respectively. The estimates for 2013, 2014 and 2015 are all within the same approximate region which is positive in terms of there being confidence in the approach. This methodology is also nationally recognised and has been used in various formats by other waste planning authorities for plan-making. Despite the weaknesses of the methodology this baseline figure is considered to be the most accurate available.

7.2.16 The relevant parts of the National Planning Practice Guidance have been followed, the primary elements of the guidance being

"*Waste planning authorities should start from the basis that net arisings of construction and demolition waste will remain constant over time...*"

7.2.17 There are not considered to be significant waste management capacity requirements stemming from major infrastructure, or other types of development such as to influence the level of projected demand for CDE waste capacity over the plan-period. Therefore, it has been assumed that the level of CDE arisings annually over the plan period to 2036 will be the derived 2015 figure of 360,114 tonnes.

8.1 Hazardous Waste Arisings

8.1.1 Hazardous waste is generally classed as a waste that has one or more of the fifteen specified hazardous properties listed in detail in Annex III to the Waste Framework Directive[63]. These are summarised as:

- Explosive
- Oxidizing
- Flammable or highly flammable
- Irritant or harmful
- Toxic or release toxic or very toxic gases on contact with water, air or an acid
- Carcinogenic
- Corrosive
- Infectious
- Teratogenic
- Mutagenic
- Substances which after disposal are capable of yielding another substance i.e. leachate
- 'Ecotoxic' substances

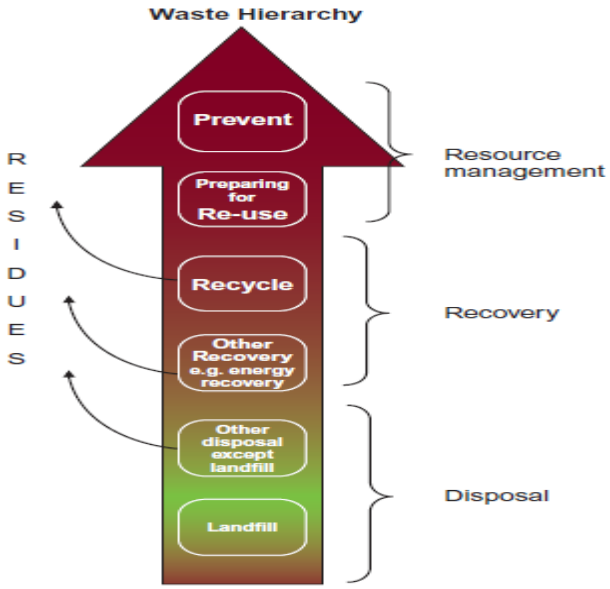
8.1.2 Hazardous Waste is highly regulated through the Waste Framework directive and hazardous waste regulations[64]. The European waste catalogue[65] includes a list of wastes and criteria used to assess if a waste is hazardous. When waste is being assessed against the criteria, which would render it hazardous, the Environment Agency has produced guidance[66], providing advice on classification and assessment of hazardous waste.

8.1.3 The National Policy Statement (NPS) for Hazardous waste[67], published in June 2013, sets out the strategic need and justification of Government policy for the provision of nationally significant infrastructure to manage such waste. This policy statement will be used to guide decisions made by the Planning Inspectorate for proposals which fall within the definition of a Nationally Significant Infrastructure Project.

8.1.4 The National Policy Statement reiterates the need for large scale hazardous waste infrastructure, as well as the drivers that influence hazardous waste arisings and the management of this waste stream. Figures provided by the Waste and Resources Action Programme (WRAP) suggest that arisings of waste desktop monitors, laptops and LCD TVs are likely to have a large influence on the quantities of arisings in the future and suggested that arisings of these sources of hazardous waste is expected to increase. The guidance also assesses alternative methods for meeting the hazardous waste demand. Although it concludes that a small number of large facilities are likely to be needed to meet the expected increase in arisings of hazardous waste.

8.1.5 The following is the most recent waste hierarchy for hazardous waste from the National Policy Statement.

[63] 2008/98/EC available at: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:312:0003:0030:EN:PDF
[64] 2005 and 2009 amendment : http://www.legislation.gov.uk/uksi/2005/894/contents/made
[65] Commission Decision 2000/532/EC as amended by 2001/118/EC, 2001/119/EC and 2001/573/EC. A consolidated version can be found at eur-lex.europa.eu/LexUriServ/site/en/consleg/2000/D/02000D0532-20020101-en.pdf
[66] http://www.environment-agency.gov.uk/business/topics/waste/32180.aspx
[67] https://www.gov.uk/government/publications/hazardous-waste-national-policy-statement



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8.1.6 DEFRA published a Hazardous Waste Strategy for England in 2010[69] which sets out the national strategy for the methodology for the management of hazardous wastes. Within the strategy six principles for managing hazardous waste have been identified as:

- The waste hierarchy,
- Infrastructure provision,
- Reduce our reliance on landfill,
- No mixing or dilution,
- Treatment of hazardous organic waste, and
- End reliance on the use of Landfill Directive waste acceptance criteria derogations.

8.1.7 The 'Strategy for hazardous waste management in England' (DEFRA, March 2010)[69] sets out the principles for the management of hazardous waste. The strategy includes a number of decision making tools to assist with choosing appropriate waste management options and aid with application of the waste hierarchy to organic wastes[70], inorganic wastes[71], waste articles and wastes which are classed as mixed[72].

8.1.8 Following the publication of the Hazardous Waste Strategy for England, DEFRA published guidance on applying the waste hierarchy to hazardous waste[73] in November 2011. This provides guidance for businesses and public bodies when they are making decisions on options for dealing with hazardous waste, including preventing it from arising in the first place. This guidance also provides an update to the waste hierarchy and decision making tools in the earlier DEFRA guidance.

8.1.9 The strategy for hazardous waste management (DEFRA[74]) summarised that the priority facility needs for hazardous waste management in England are as follows:

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

[69] http://webarchive.nationalarchives.gov.uk/20130505065433/http://archive.defra.gov.uk/environment/waste/topics/hazwaste/documents/policy.pdf

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

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

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

[73] https://www.gov.uk/government/publications/guidance-on-applying-the-waste-hierarchy-to-hazardous-waste

[74] A strategy for hazardous waste management in England, 2010 http://webarchive.nationalarchives.gov.uk/20130505065433/http:/archive.defra.gov.uk/environment/waste/topics/hazwaste/documents/policy.pdf

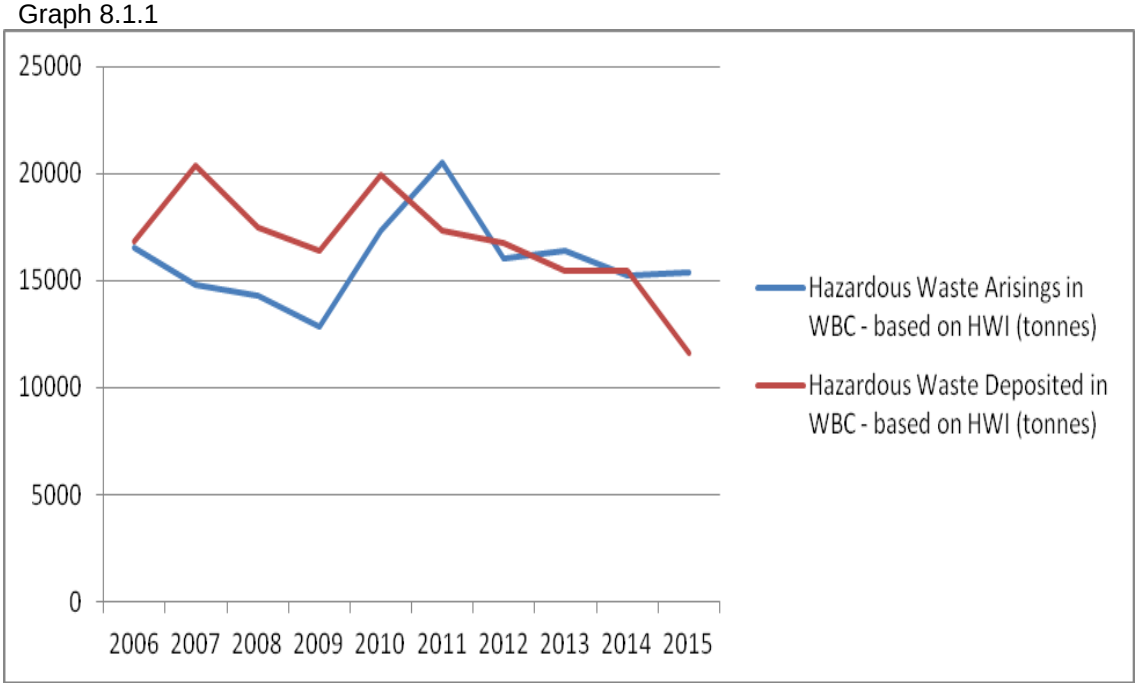
- *Oily sludges:* Additional thermal desorption plant for the treatment of oily sludges and oily filter cakes may be needed.
- *Waste oils*: There are some 350,000 tonnes of waste oils arising annually in the UK which require treatment. There is a capacity of approximately 70,000 tonnes per annum of waste oil regeneration/recycling/laundering. There is a demand for at least one further modern high quality oil regeneration plant (re-refinery) with a capacity of 80,000 tonnes per annum.
- *Air Pollution Control Residues:* Environment Agency's hazardous waste data shows annual arisings of APC in the last three years were: 111,000 tonnes in 2006, 118,000 tonnes in 2007 and 122,000 tonnes in 2008.

8.1.10 The strategy undertook an analysis of the energy from waste plants under construction, and those which have received planning approval, which indicates that arisings of APC residues would increase by a further 172,000 tonnes, if all the permitted plants come on stream. It concluded that there is a need for at least five facilities that can convert APC residues to other materials that can be re-used, each with a capacity of 33,000 tonnes per annum.

8.1.11 From a review of these reports it can be summarised that further capacity in England is necessary to deal with certain aspects of this specialist waste stream. The market is likely to dictate when there is a need for these treatment facilities and where such a facility is best located, and the purpose of the planning system is to guide development to suitable locations.

8.1.12 The following graphs utilise data from the Environment Agency's Hazardous Waste Data Interrogator (HWI). Graph 8.1.1 indicates that the levels of hazardous waste arisings in West Berkshire have fluctuated broadly between 13,000 and 20,000 tonnes between 2006 and 2015. The levels of hazardous waste managed ((referred to as deposited in HWI) in West Berkshire over the same period have ranged between 12,000 and 20,000 tonnes. Although in the last 5 years the amount of waste managed in West Berkshire has declined at a more rapid rate than the amount of arisings, the levels of hazardous waste 'deposited' and 'arising' have fluctuated within approximately the same differential over the last 10 years. It is acknowledged that throughout the period displayed on graph 8.1.1 there have been changes in the definitions of hazardous waste, and also in thresholds in terms of the makeup of a waste material and when it would be classed as hazardous.

Graph 8.1.1



8.1.13 Graph 8.1.2 and table 8.1.1 below show the waste managed and arising in West Berkshire for 2015 broken down into European Waste Catalogue codes (explained in table 8.1.1). The table shows some of the smaller tonnages which are too small to be illustrated on the graph. The four largest contributors in terms of arisings are '13 - Oil wastes and wastes of liquid fuels'; '16 - Wastes not

otherwise specified in the list'; '17 - Construction and demolition wastes'; and '19 - Wastes from waste management facilities, off-site waste water treatment plants'. With regard to hazardous waste managed in West Berkshire, the four largest, in descending order are: '20 Municipal wastes and similar commercial wastes'; '8 Wastes from the formulation, supply and use of coatings, adhesives, sealants and printing inks'; '13 Oil wastes and wastes of liquid fuels'; and '16 Wastes not otherwise specified in the list'.

8.1.14 Although, at just under 6,000 tonnes, '13 - Oil wastes and wastes of liquid fuels' are by far the largest contributor in terms of arisings, only approximately half of this amount is managed in West Berkshire. The third largest source of hazardous waste at 2,100 tonnes, is via the '17 - Construction and demolition' classification, and virtually none of this type of waste is managed in West Berkshire. '20 - Municipal wastes and similar commercial wastes' make up the largest element of waste deposited in West Berkshire at approximately 4,000 tonnes, while only roughly 600 tonnes arise within the district. Just under 3,000 tonnes of hazardous waste from the '08 - Wastes from the formulation, supply and use of coatings, adhesives, sealants and printing inks' classification is deposited in the district while less than a hundred tonnes arise within West Berkshire.

Graph 8.1.2

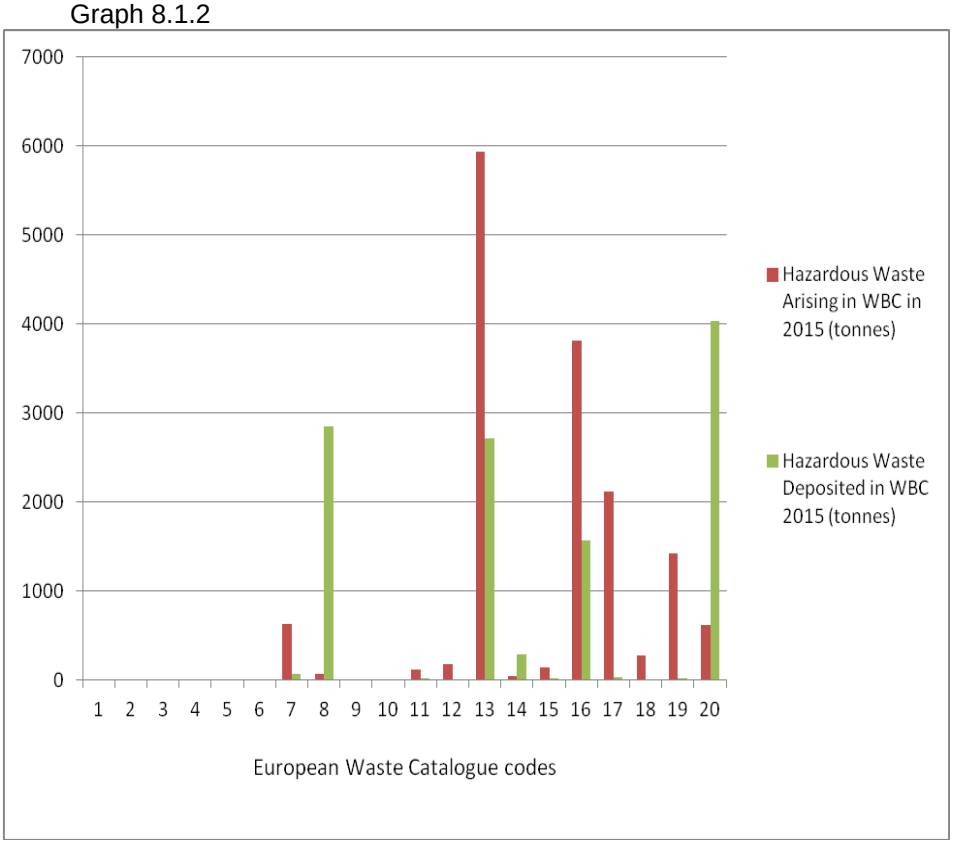


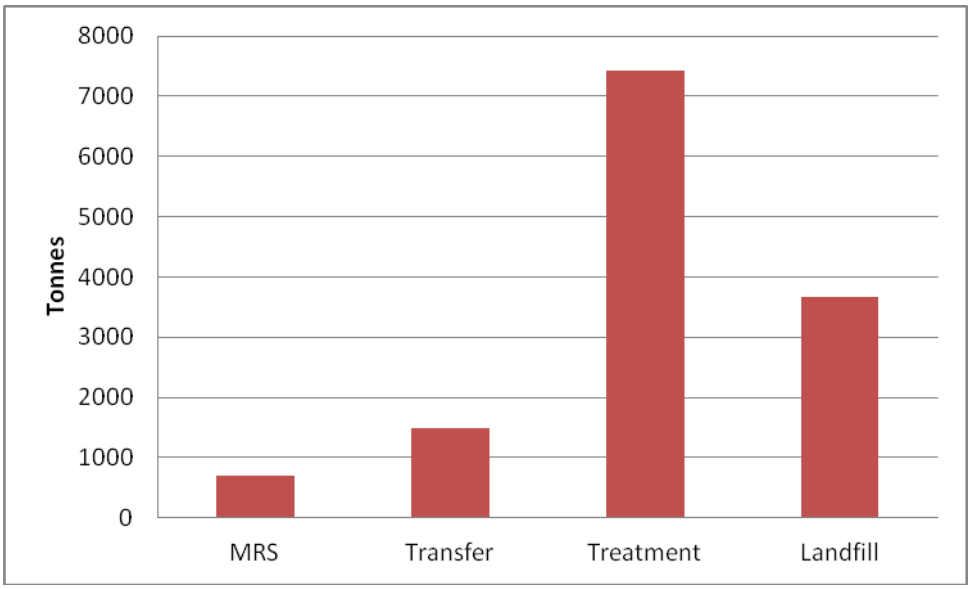
Table 8.1.1

EWC Chapter		Hazardous Waste Arising in WBC in 2015 (tonnes)	Hazardous Waste Deposited in WBC 2015 (tonnes)
1	Mining wastes	0.34	0
2	Wastes from agriculture, horticulture, aquaculture, forestry, hunting and fishing	0.14	0
3	Wastes from wood processing	0	0
4	Wastes from the leather, fur and textile industries	0	0
5	Wastes from petroleum refining, natural gas purification and pyrolytic treatment of coal	0.37	0
6	Wastes from inorganic chemical processes	4.29	0.005
7	Wastes from organic chemical processes	628.35	66.88
8	Wastes from the formulation, supply and use of coatings, adhesives, sealants and printing inks	73.29	2846.78
9	Wastes from the photographic industry	10.61	0
10	Wastes from thermal processes	0	0
11	Wastes from chemical surface treatment and coating of metals and other materials	115.83	19.58
12	Wastes from shaping and physical and mechanical surface treatment of metals and plastics	181.78	0
13	Oil wastes and wastes of liquid fuels	5937.69	2719.66
14	Waste organic solvents, refrigerants and propellants	49.85	294.69
15	Waste packaging; absorbents, wiping cloths, filter materials and protective clothing	138.28	15.31
16	Wastes not otherwise specified in the list	3813.95	1564.78
17	Construction and demolition wastes	2113.09	30.61
18	Wastes from human or animal health care and/or related research	272.29	0
19	Wastes from waste management facilities, off-site waste water treatment plants	1429.06	21.43
20	Municipal wastes and similar commercial wastes	622.70	4034.90
Total		**15,392**	**11,615**

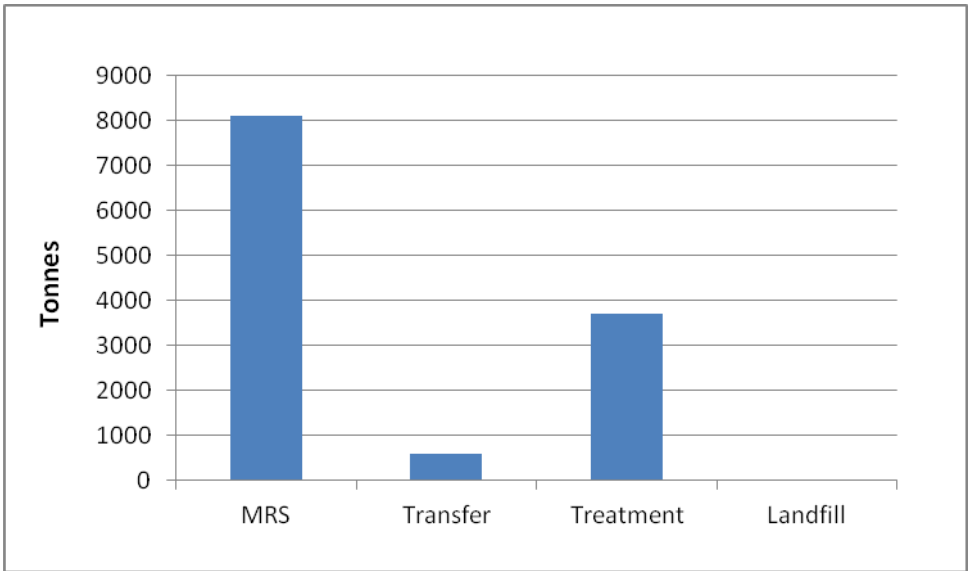
8.1.15 Another data source for hazardous waste arisings is the EA Waste Data Interrogator (WDI). It would be logical if the WDI was consistent with the HWI as both databases are produced by the EA from operator returns. This is not the case however, and this is likely to be due to a number of reasons including overlap in terms of different types of hazardous waste, and the reliance on operators stating the correct quantities of waste accurately within specific categories. It is considered that with regard to hazardous waste, the data in the HWI is likely to be more accurate than that which is extracted from WDI, however HWI does not provide any site information while the WDI does, and this is the same for the types of waste management that are undertaken.

8.1.16 Acknowledging the likely inaccuracies, WDI has been used to extract data for 2015, and according to this data source the total amount of waste received where the origin was recorded as being West Berkshire was 13,289 tonnes. This is less than the 'arisings' figure from HWI which can be seen in table 8.1.1 above at 15,392 tonnes. Hazardous waste received in West Berkshire extracted from WDI is shown as being slightly higher than the amount of waste 'deposited' in West Berkshire according to the HWI, at 12,399 tonnes and 11,615 tonnes respectively. It is widely acknowledged that the 'waste received' data from WDI is more reliable than the 'waste removed' data and that is why the former dataset has been used for these purposes.

Graph 8.1.3 – Hazardous waste received where the origin is identified as being West Berkshire in 2015[75]



Graph 8.1.4 – Hazardous waste received in West Berkshire in 2015



8.1.17 The disparities between the tonnages extracted from WDI and HWI are not considered to be huge and therefore the WDI data has been used in graph 8.1.3 and 8.1.4 above to give a broad indication of how hazardous waste is managed within West Berkshire and how the hazardous waste which is exported from West Berkshire is managed.

8.1.18 In terms of consented capacity, West Berkshire only has inert landfill capacity and therefore if hazardous waste requires landfilling, it must be exported from the district in order that it can go to a suitable site. It therefore follows that landfilling of these wastes in West Berkshire would be zero, while hazardous waste exports to other authority areas for landfilling would be taking place as is shown in graph 8.1.3 above. In West Berkshire the relatively high level of hazardous waste treated through 'MRSs (Metal Recycling Sites)' and that which is managed by 'Treatment' facilities primarily result from 3 sites, 2 being car breakers/metal recyclers, and 1 of which deals with redundant IT equipment. According to WDI, Wiltshire was the largest receiver of hazardous waste from West Berkshire in 2015 (3581 tonnes), 3,353 tonnes of which was via landfill in one site. However the permit type for this site is shown as 'L02 : Non Haz (SNRHW) LF', therefore it is unclear as to whether this material was actually hazardous waste. In 2015, in descending order, the WPAs in

[75] Environment Agency, Waste Data Interrogator 2015

receipt of the largest quantities of hazardous waste from West Berkshire were Wiltshire (acknowledging the point just made) at 3,581 tonnes; Hampshire at 1,711 tonnes, Derbyshire at 1,170 tonnes, Surrey at 976 tonnes and Oxfordshire at 829 tonnes.

Baseline for hazardous waste in West Berkshire

8.1.19 Although hazardous waste is being covered separately in this LWA, it will form a component of municipal solid waste, commercial and industrial wastes, and construction, demolition and excavation waste. It is widely acknowledged that the majority of hazardous waste is likely to come from the commercial and industrial sector, with a smaller proportion coming from construction, demolition and excavation wastes, and municipal solid waste.

8.1.20 When considering graph 8.1.2 and table 8.1.1 it is clear that the majority of hazardous waste arising in West Berkshire fall within the following classifications:

- Oil wastes and wastes of liquid fuels
- Wastes not otherwise specified in the list
- Construction and demolition wastes
- Wastes from waste management facilities, off-site waste water treatment plants

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8.1.21 For the purposes of this Local Waste Assessment, and projecting potential future arisings, a trend line will be established using the available arisings data from HWI over the period 2006 to 2015. This will be projected forward to 2036 and this aligns with national guidance which advocates using existing data to derive trends. A growth rate will also be applied to the arisings figure of 15,392 tonnes derived from HWI for 2015 in order that the arisings can be projected throughout the plan-period to 2036.

8.2 Hazardous waste projections to 2036

8.2.2 The study into Hazardous Waste in the South East of England, 2009, commissioned by the South East England Regional Assembly (SEERA), was based upon the following scenario growth rates:

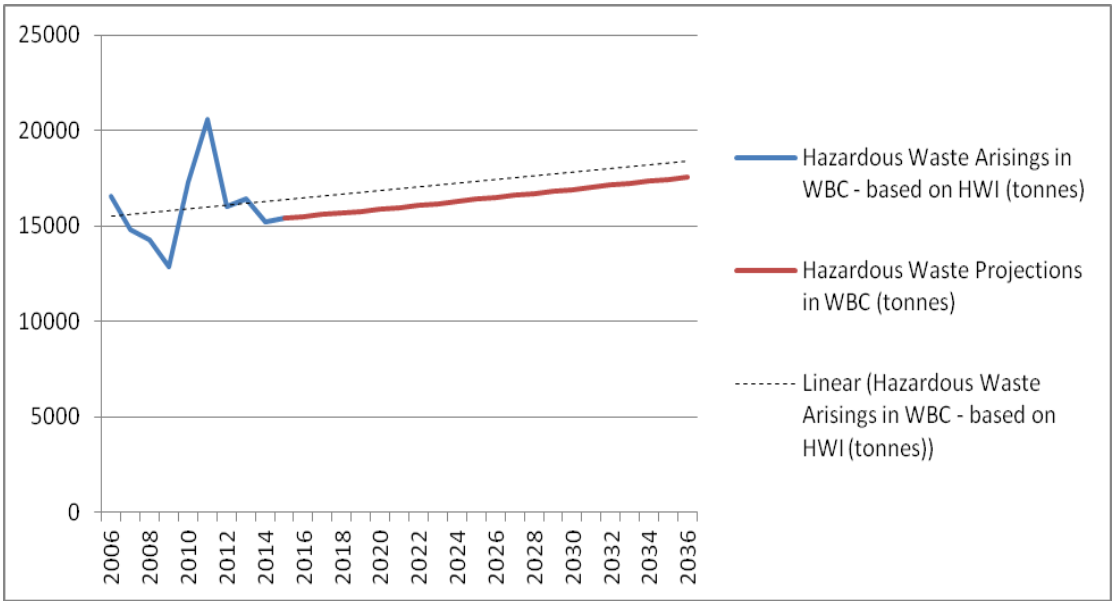
> *Growth Scenario 1:* Stabilised growth based on the predicted hazardous waste growth rates (this is based upon commercial and industrial growth) used by ERM in "*Regional Waste Management Capacity: Survey, Methodology and Monitoring*" March 2007.
>
> *Growth Scenario 2:* Growth prediction is based on the Waste Strategy 2007 predictions for commercial and industrial waste streams. This predicts an overall rise of 2.6% per annum for commercial wastes, while industrial growth stabilises and remains static.

8.2.3 This model has been updated a number of times since its early inception in 2004 when MEL Research and Golder Associates were commissioned by SEERA to update current estimates and forecasts of future waste management capacity for the region. ERM updated this model in 2005 and again in 2007 and a further update was completed in 2009 to inform the South East Plan. The most recent version is the February 2010 version.

8.2.4 The SEERA/ERM report, where it models hazardous waste growth rates, assumed that this waste stream would grow at the same rate as commercial and industrial wastes. The rationale for this assumption was that the majority of hazardous wastes would come from this sector. The total growth increased in commercial and industrial wastes were predicted to therefore be mirrored by the growth of hazardous wastes. The report indicated that it was likely that the adopted 'worst case scenario' approach was unlikely to come to fruition as it was assumed that there would be a resulting decrease in hazardous waste generation due to impact from regulatory changes.

In this LWA the worst case scenario for C & I waste growth rates was based on the growth rate that was used by the South East England Partnership Board in the 2010 update of the regional model. In line with the SEERA/ERM approach for hazardous waste forecasting, this growth rate of 0.63% has been applied to the baseline figure for hazardous waste arisings from 2015 to 2036. A trend line derived from the available arisings data has also been used to project arisings to 2036. Graph 8.1.5 below shows the results of these projections. The projected hazardous waste arisings by 2036 are likely to be between approximately 17,500 tonnes and 19,000 tonnes. In terms of plan making the upper end of this estimated range (19,000 tonnes) will be taken forward.

Graph 8.1.5



Summary of future forecasting for the hazardous waste stream

8.2.5 Like most other authorities West Berkshire is unlikely to be able to be in a position whereby it can manage all the hazardous wastes that originate within the authority. This is largely due to the specialist nature of the wastes, and the treatment methods needed to manage the wastes within this stream. As only small quantities of certain types of hazardous waste arise in West Berkshire, it would not be economically viable to have all the necessary facilities in the authority area. As such there will always be cross boundary movements, however as graph 8.1.1 demonstrates, over the period 2006 to 2015, the level of hazardous waste arising in West Berkshire has been fairly similar to the amount of hazardous waste that has been managed in West Berkshire.

8.2.6 At the moment it is estimated that West Berkshire has somewhere in the region of 20,000 to 25,000 tonnes of capacity to manage hazardous waste streams. Unfortunately it is very difficult to estimate the overall hazardous waste management capacity in West Berkshire with any accuracy, as although it would be managed at specific sites, it would primarily be as part of the commercial and industrial waste stream, and construction, demolition and excavation waste stream. In terms of specific sites, accurate breakdowns are not generally available of hazardous waste as a proportion overall site waste management capacity. Environmental permits are a potential source of information for this, however these will tend to be upper limits in standard permits and are unlikely to reflect actual waste management capacity which would be based on a number of considerations.

9.1 Radioactive Waste Arisings

9.1.1 Radioactive waste is defined in terms of waste streams, as documented by the Nuclear Decommissioning Authority (NDA)[76]. It is often distinguishable by its radionuclide content and in many cases also by its physical and chemical characteristics. The categories of radioactive waste are defined in the UK as follows:

- High Level Waste (HLW): Wastes in which the temperature may rise significantly as a result of their radioactivity, so this factor has to be taken into account in their management.
- Intermediate Level Waste (ILW): Wastes exceeding the upper boundaries for LLW, but which do not require heating to be taken into account in the design of storage or disposal facilities.
- Low Level Waste (LLW): Wastes containing radioactivity greater than 0.4 MBq per tonne, but not exceeding 4 GBq per tonne of alpha, or 12 GBq per tonne of beta/gamma activity. Since 1959 about 1 million cubic metres of LLW from the nuclear power industry, hospitals, research establishments and the defence programmes have been sent to the Low Level Waste Repository in Cumbria (referred to as 'the LLWR').
- Very Low Level Waste (VLLW): VLLW is a sub category of LLW.

9.1.2 The Atomic Weapons Establishment (AWE) sites Aldermaston and Burghfield are located in West Berkshire. These facilities manage the whole life cycle of the United Kingdom's nuclear deterrent from initial concept and design, through component manufacture and assembly, to in-service support and, finally, decommissioning and disposal. As these sites have the potential to generate arisings of low level and intermediate level radioactive waste, it is relevant to consider them in this report.

9.1.3 The disposal of radioactive wastes from nuclear and non-nuclear sites – including the transfer of solid wastes for burial, incineration or storage elsewhere, as well as the discharge of liquid and gaseous wastes to the environment – is regulated under the Radioactive Substances Act 1993 (RSA93)[77]. In England and Wales, the regulatory body is the Environment Agency (EA). For radioactive wastes arising on non-nuclear licensed sites, the Environment Agency has regulatory responsibility for both accumulation and disposal.

9.1.4 High level radioactive waste is normally only generated by nuclear facilities, such as nuclear power stations. Lower level radioactive wastes are also generated by medical sources such as radiotherapy treatment and x-rays, and industrial sources. Radioactive material can be found in many homes, in ionizing smoke detectors.

Management of Low Level radioactive waste management

9.1.5 At present, the vast majority of Low Level Waste is super-compacted to minimise its volume. In this process, drums or boxes of waste are compacted under high pressure. The waste is placed in large metal containers, similar to shipping containers. These are then filled with cement and placed in concrete-lined vaults at the LLWR. To date about 10,000 containers have been produced and the total vault space occupied by Low Level Waste is about 200,000 cubic metres. Currently, suitable metal Low Level Waste is being decontaminated to remove radioactivity so that it can be recycled.

Management of Intermediate Level radioactive waste

9.1.6 For most Intermediate Level Waste, packaging consists of immobilisation in cement-based materials within 500 litre stainless steel drums or $3m^3$ stainless steel boxes. Large items are packaged in higher capacity stainless steel or concrete boxes. Wastes may first be treated to reduce their water content to an optimum level for packaging. Certain materials, and small items of equipment, can be supercompacted, while other solid wastes are cut up to reduce their size. ILW packaging plants are understood to operate at Dounreay (Scotland), Harwell (Oxfordshire), Sellafield (Cumbria), Trawsfynydd (Wales), and Winfrith (Dorset).

[76] https://ukinventory.nda.gov.uk/about-radioactive-waste/what-is-radioactivity/what-are-the-main-waste-categories/
[77] http://www.legislation.gov.uk/ukpga/1993/12/contents

Management of High level radioactive waste

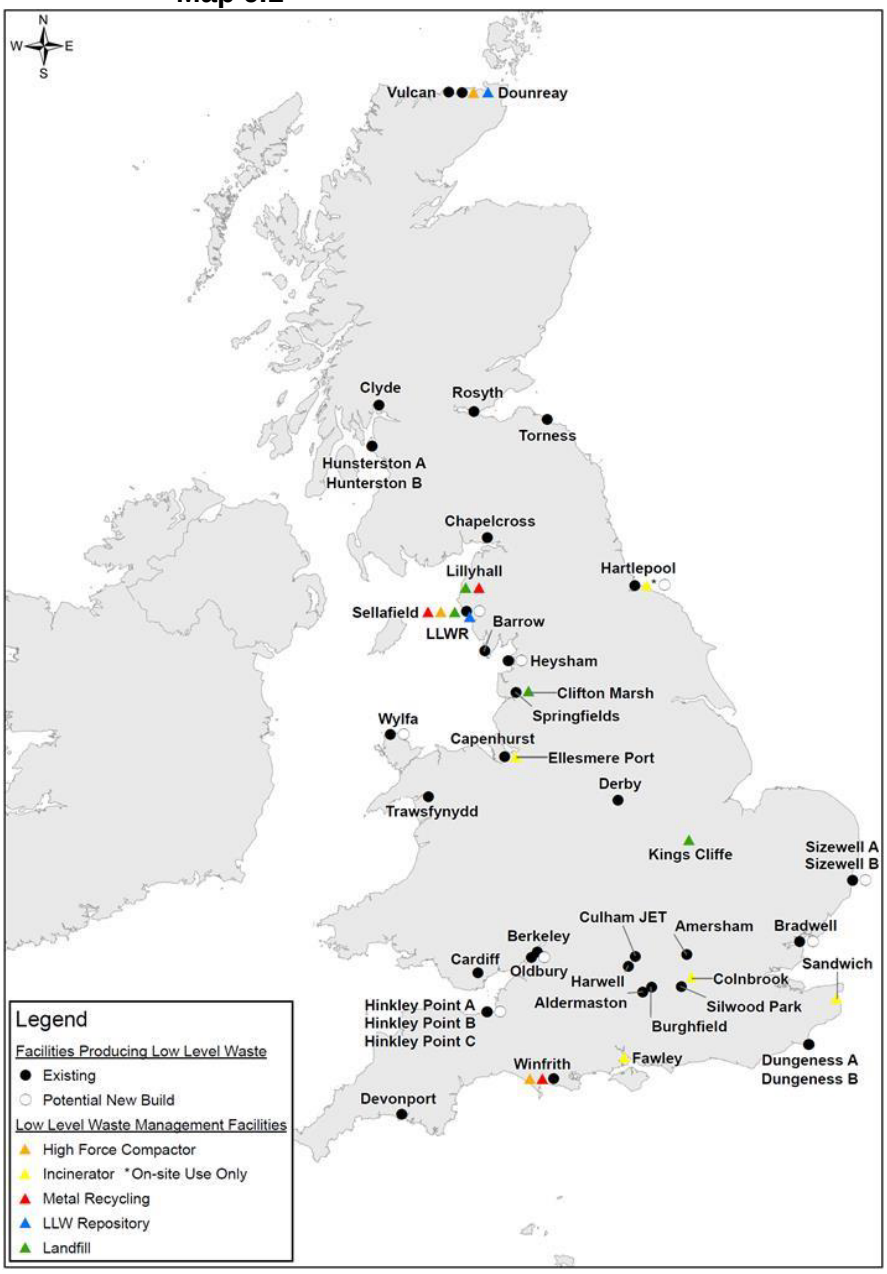
9.1.7 At Sellafield, high level liquid waste is currently incorporated into borosilicate glass, using a process called vitrification. The waste is heated to dryness leaving a fine powder, which is mixed with crushed glass in a furnace to produce a molten product incorporating the waste. This is then poured into stainless steel canisters, which hold approximately 150 litres, and a stainless steel lid is welded on. Current practice is for vitrified High Level Waste to be stored for at least 50 years before disposal. This allows a significant proportion of the radioactivity to decay, for the waste to become cooler, and so make it easier to transport and dispose of, makes long-term management less complex.

9.1.8 The overwhelming majority of LLW arising in the UK comes from the nuclear industry. Below map 9.1 shows the major sites where Low Level Waste is managed.

9.1.9 There are many hospitals and industrial, educational and research establishments that produce small quantities of radioactive wastes; their sites are not shown on the map. Most of their wastes are safely disposed of with municipal, commercial or industrial wastes and is not reported in the Radioactive Waste Inventory[78]. The small fraction of these wastes that is subject to specific regulatory controls is managed at Sellafield and Harwell and is included in the Inventory. There are also several small sources of radioactive waste that cannot be allocated to a specific geographical location.

[78] https://ukinventory.nda.gov.uk/

Map 9.1



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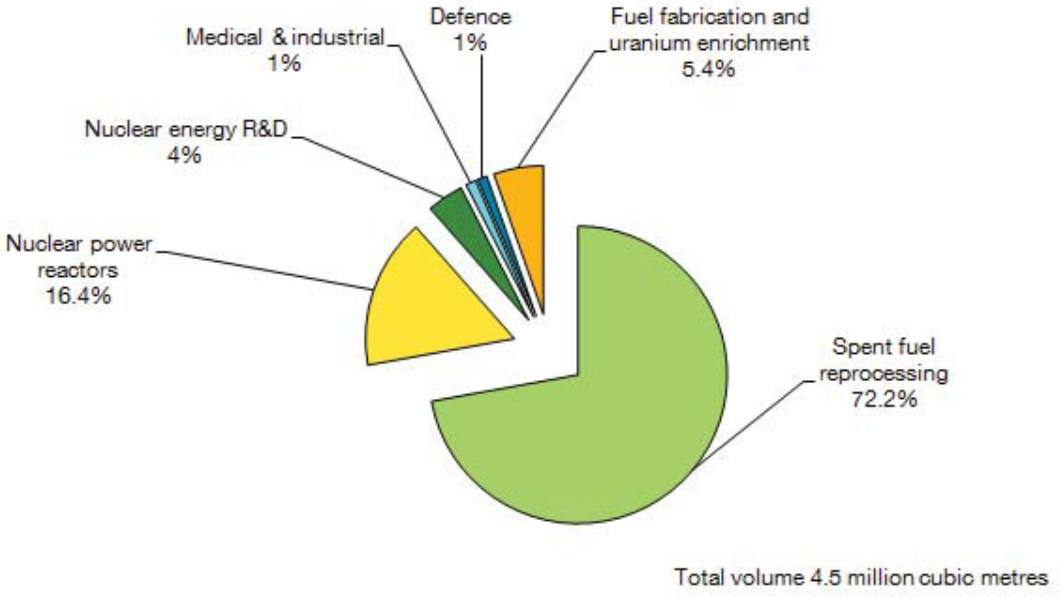
9.1.10 The Nuclear Legacy Advisory Forum (NuLeAF) is Special Interest Group of the Local Government Association, its remit encompassing all aspects of the management of the UK's nuclear waste legacy, including spent nuclear fuel and waste management from prospective new nuclear generating capacity. NuLeAF has produced numerous policy statements relating to the long-term management of very low, low, medium and high level wastes.

9.1.11 Briefing paper 23 by NuLeAF (June 2013)[79] provides interim advice on approaches to radioactive waste management in local plans. This includes an overview of existing planning policies on radioactive waste, development in government's approach to spatial planning, duty to cooperate, and the National Waste Management Plan.

9.1.12 The following pie chart details the United Kingdom's radioactive waste production by activity. As can be seen the vast majority of the UK's radioactive waste is produced through the reprocessing of spent fuel.

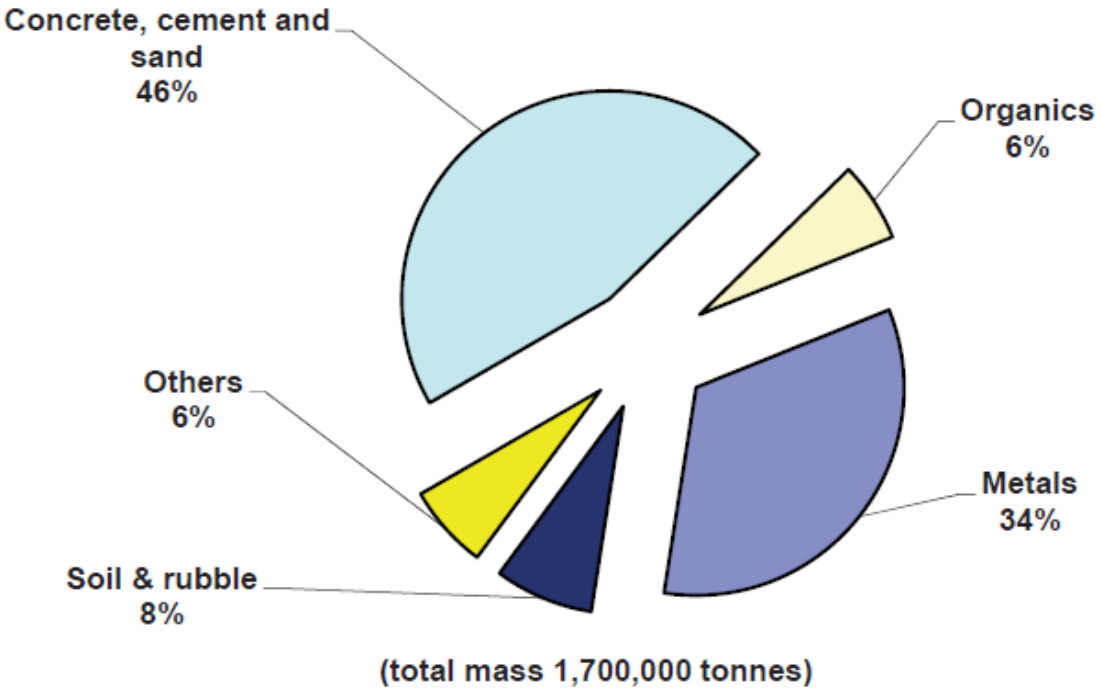
[79] http://www.nuleaf.org.uk/document-library/briefing-papers/attachment/nuleaf-updated-advice-on-planning-and-radioactive-wastefeb2015-v2

Graph 9.1[80]



9.1.13 The composition of Low Level Waste was reported as follows in the 2013 radioactive waste inventory[81].

Graph 9.2



9.1.14 The LLWR produced a report[82], in March 2013, which focussed on the analysis of the Low Activity Low Level Wastes and very low level waste quantities likely to require disposal in near surface sites, in comparison to the capacity of existing sites in the UK between 2012 and 2030. The report looked

[80] https://ukinventory.nda.gov.uk/wp-content/uploads/sites/2/2014/02/14D039-NDASTSTY140006-UKRWI-2013-High-Level-Summary.pdf
[81] https://ukinventory.nda.gov.uk/wp-content/uploads/sites/2/2014/02/14D040_NDASTSTY140011_-_Radioactive_Waste_Composition.pdf
[82] http://llwrsite.com/wp-content/uploads/2013/04/NWP-REP-011-LA-LLW-capacity-assessment-issue-3-Mar-2013.pdf

at both the national picture and the regional picture (limited to two regions – north and south) for arisings and capacity. This focused on the three sites that can potentially accept waste from anywhere in the United Kingdom (The East Northants Resource Management Facility (ENRMF at King's Cliffe), Clifton Marsh and Lillyhall). This is relevant as it states:

- There is adequate capacity until 2026 after which further capacity would need to be identified.
- In the Northern region there is adequate capacity – at Lillyhall and Clifton Marsh until 2020.
- In the Southern region there is adequate capacity until 2026 – the ENRMF is the only facility in the region at present.
- The possible potential for the use of some Low Activity Low Level Wastes in the Low Level Waste Repository cap is noted although this is still under investigation.

9.1.15 DECC produced a report in 2008 on the Data collection on solid low-level waste from the non-nuclear sector[83]. This report looked at premises authorised under the Radioactive Substances Act 1993 confirming that, in 2008, there were 877 facilities in England, Scotland and Wales. 766 of these facilities were contacted, with a response rate of 35%. A further 3% refused to complete the questionnaire. This DECC report summarised that:

- Although current waste quantities may be somewhat higher than in previous years, at least for those undertakings responding to the survey, the quantities appear to have peaked, and in some cases are anticipated to reduce in the coming few years.
- Overall waste volumes and masses have been steady, but are expected to fall. However, there is an indication that although volumes and masses may fall, activities generating such wastes are likely to grow[84]
- Few parties responding to the survey expressed any significant problems with low level waste management at present. However, the low response rate to the survey means that this finding should be treated cautiously.
- On the basis that the survey included around 20% of all authorisation holders, and that the bulk of the arisings are from one area of the United Kingdom, that appeared to be well represented in the survey, it is estimated that total United Kingdom arisings of low level radioactive waste from the non-nuclear industry are very unlikely to exceed 100,000 m^3 per year. There is still uncertainty in the actual volume produced with an estimated range of 52,000 to 100,000m^3 of waste generated per year. This compares with the estimated average waste arisings per year from the nuclear industry of ~40,000m^3/yr over the next 10 years.
- The report shows that the low level waste repository is only a minor route for the non-nuclear industry in terms of volume, which is believed to show that alternative waste routes are already available and readily used for disposal.

9.1.16 In 2012 DECC published the Strategy for the management of solid low level radioactive waste from the non-nuclear industry in the United Kingdom[85]. The strategy intended to:

- Provide guidance and background information on this type of waste to enable planning authorities to make informed decisions on planning applications and to respond to concerns from their elected members and constituents.
- Clarify the respective roles of waste producers, the environment agencies, planning authorities and the Nuclear Decommissioning Authority to enable decisions to be made that properly recognize the responsibilities of others.
- Ensure that waste producers and regulators are fully aware of how the regulatory framework should be applied to LLW, particularly the need for waste management plans, waste minimisation at source and use of the waste hierarchy.

9.1.17 The managing radioactive waste safely programme[86] has completed a call for evidence on the siting process for a national geological disposal facility. This process has been reviewed and commenced

[83] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/48119/2132-data-collection-lowlevel-waste-nonnuclear.pdf
[84] Care has to be taken in attempting to produce a national picture of waste arisings due to statistical limitations.
[85] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/48291/4616-strategy-low-level-radioactive-waste.pdf

consultation by the Department for Energy and Climate Change (DECC)[87] in September 2013. This confirms that the United Kingdom Government continues to believe that geological disposal, preceded by safe and secure interim storage, is the right policy for the long-term management of higher activity radioactive waste. To identify potential sites for a geological disposal facility, the United Kingdom Government continues to favour an approach based on voluntarism (that is, the willingness of local communities to participate), working in partnership with communities that may ultimately host a facility. This programme provides an update to the findings of the 2008 Managing Radioactive Waste Safely White Paper[88] highlighting how engagement with communities could be improved. This approach provides the community the 'right to withdraw' throughout the siting process. The programme confirms that community benefits may be paid when the 'focusing phase' commenced, involving identification of potentially suitable sites in more detail. This would be preceded by a 'learning phase' which assesses the local geology and potential socio-economic impacts of a geological disposal facility on the local area. After the 'focusing phase' the document requires demonstration of local support to the siting process. This document also confirms that a National Policy Statement on a geological disposal facility would be developed soon after the launch of the revised siting process.

Radioactive waste arisings in West Berkshire

9.1.18 The Nuclear Decommissioning Authority (NDA) prepares and maintains an inventory of radioactive waste in the United Kingdom[89] in conjunction with DECC, known as the United Kingdom Radioactive Waste Inventory (the Inventory). The Inventory completed every 3 years is the most comprehensive and up to date source of information on radioactive waste in the United Kingdom in the public domain. The most recent update was completed in 2013.

9.1.19 The 2007 and 2010 radioactive waste inventory report by the Nuclear Decommissioning Authority states the following for AWE Aldermaston:

Table 9.1[90]

Site	Year	Waste Category	Raw, partly treated and conditioned waste: volume as stored at 1st April	All radioactive waste at 1st April and future arisings			
				Raw, partly treated and conditioned waste: volume as stored	When all wastes are conditioned		
					Number of packages	Packaged volume	Conditioned volume
Aldermaston	2007 [91]	Intermediate level waste	4,280	9,820	8,810	5,040	4,380
		Low level waste	1,150	38,300	2,690	52,400	41,900
		Sub total	5,420	48,200	11,500	57,400	46,300

[86] https://www.gov.uk/government/policies/managing-the-use-and-disposal-of-radioactive-and-nuclear-substances-and-waste
[87] https://www.gov.uk/government/consultations/geological-disposal-facility-siting-process-review
[88] https://www.gov.uk/government/publications/managing-radioactive-waste-safely-a-framework-for-implementing-geological-disposal
[89] http://www.nda.gov.uk/ukinventory/
[90] Please note that it is difficult to trace the consigned volume to the disposal volume. For example, AWE may consign an ISO freight container containing up to 72 drums of LLW to the LLW compactor operated on behalf of LLWR where the volume is reduced by a factor of 5. The compacted drums are then loaded into a disposal container [typically a half height ISO container] and grouted before placing in the LLWR vault. So for this reason the volumes stated should be treated with caution.
[91] http://webarchive.nationalarchives.gov.uk/20150817115932/http://www.nda.gov.uk/ukinventory/documents/Reports/Supporting_documents/upload/2007-Inventory-Waste-quantities-by-site.pdf

	2010 [92]	Intermediate level waste	4,630	9,140	8,280	4,730	4,110
		Low level waste	998	31,100	2,150	41,900	33,500
		Sub total	5,630	40,200	10,400	46,600	37,600

9.1.20 The Radioactive Waste Inventory 2013[93] does not provide the data in the same format as has previously been published in the 2007 and 2010 inventories (as above in table 9.1), however in terms of reported, conditioned, and packaged radioactive waste arising from Aldermaston and Burghfield as of 1 April 2013, the following data is available (tables 9.2, 9.3 and 9.4).

Table 9.2 – Reported volumes

Waste Category	Volume (m3) Reported 1st April 2013	Estimated future arisings	Lifetime total
HLW	0	0	0
ILW	4,030	5,120	9,160
LLW	2330	19400	21800
VLLW	0	0.	0
TOTAL	**6,360**	**24,500**	**31,000**

Table 9.3 – Conditioned volumes

Waste Category	Volume (m3) Reported 1st April 2013	Estimated future arisings	Lifetime total
HLW	0	0	0
ILW	1,990	2,140	4,130
LLW	1560	9600	11200
VLLW	0	0	0
TOTAL	**3,550**	**11,700**	**15,300**

Table 9.4 - Packaged volumes

Waste Category	Volume (m3) Reported 1st April 2013	Estimated future arisings	Lifetime total
HLW	0	0	0
ILW	2,310	2,450	4,750
LLW	1750	9630	11400
VLLW	0.00	0	0
TOTAL	**4,060**	**12,100**	**16,200**

9.1.21 As referred to above, the Atomic Weapons Establishment (AWE) sites Aldermaston and Burghfield are located in West Berkshire. These facilities manage the whole life cycle of the United Kingdom's nuclear deterrent from initial concept and design, through component manufacture and assembly, to in-service support and, finally, decommissioning and disposal. AWE Burghfield, a former munitions factory, is responsible for the complex final assembly and maintenance of the warheads while in service, as well as their decommissioning.

[92] http://webarchive.nationalarchives.gov.uk/20150817115932/http://www.nda.gov.uk/ukinventory/documents/loader.cfm?csModule=security/getfile&PageID=10619
[93] https://ukinventory.nda.gov.uk/site/aldermaston-burghfield/

9.1.22 As these are particular sites with potential to generate arisings of very low level, low level and intermediate level radioactive waste in West Berkshire it is relevant to consider them in this report. Although wastes from Burghfield are produced, for reporting purposes the arisings are included with those from Aldermaston, from where radioactive waste storage and disposal is co-ordinated.

9.1.23 The 2010 waste inventory[94] included lists of radioactive waste streams, and for AWE Aldermaston (Burghfield is not listed separately), the inventory lists that when all the wastes are packaged the following totals of wastes will be generated:

Table 9.5

When all wastes at 1.4.2010 and future arisings are packaged		High Level Wastes (m^3)	Intermediate Level Wastes (m^3)	Low Level Wastes (m^3)	Total (m^3)
Total	Number of packages	6,770	225,000	64,300	296,000
	Packaged volume	1,330	488,000	4,550,000	5,030,000
	Conditioned volume	1,020	378,000	4,400,000	4,780,000

9.1.24 It was not possible to update table 9.5 for 2013, however variations between the conditioned and packaged quantities for the low level wastes can be explained by the quantities of low level waste immobilised in cement based matrices at Aldermaston. The 2010 and 2013 waste inventories states that the proportion of cement that makes up these conditioned products, mainly sludge's at Aldermaston, typically accounts for between about 40% and 80% by mass depending on the particular waste. These containers of solid low level wastes are then first grouted using low viscosity cement before being transported to the LLWR.

9.1.25 The Low Level Waste Repository Ltd report[95] provides an indication of the source of the Low Level Waste arisings which may arise from Aldermaston in the future. It refers to the AWE Integrated Waste Strategy and states that:

> "Figure 4 in Section 4.3 of the AWE's Integrated Waste Strategy provides an indication of Low Level Waste arisings per annum, as follows:
>
> - Legacy (Pre 2010) – approx. 200m^3
> - Operational[96] (2010 – 2038) – approx. 5,500m^3
> - Decommissioning[97] (2010 -2060) – approx. 8,000m^3
>
> (Note: waste volumes are indicative and taken from bar chart)

9.1.26 The 2013 Waste Inventory also provides data on radioactive contaminated land at Aldermaston (and Burghfield):

[94] United Kingdom Radioactive Waste Inventory: Main Report produced for the Nuclear Decommissioning Authority (NDA) and the Department of Energy & Climate Change (DECC) http://webarchive.nationalarchives.gov.uk/20150817115932/http://www.nda.gov.uk/ukinventory/documents/Reports/upload/2010-UK-Radioactive-Waste-Inventory-Main-Report.pdf
Please note that it is difficult to trace the consigned volume to the disposal volume. For example, AWE may consign an ISO freight container containing up to 72 drums of LLW to the LLW compactor operated on behalf of LLWR where the volume is reduced by a factor of 5. The compacted drums are then loaded into a disposal container [typically a half height ISO container] and grouted before placing in the LLWR vault. So for this reason the volumes stated should be treated with caution.

[95] http://www.llwrsite.com/wp-content/uploads/2013/04/Low-Level-Waste-Strategic-Review-2010.pdf

[96] Operational relates to activities supporting the core mission – managing the UK's deterrent.

[97] Decommissioning arises from dealing with legacy plant, equipment and facilities.

Table 9.6[98]

Stocks	At 1.4.2013	216.0m³
Future arisings	1.4.2013 - 31.3.2060	3698.0m³
Total future arisings		3698.0m³
Total waste volume		3914.0m³

9.1.27 The future arisings in table 9.6 above are based on the figures calculated as part of the 2012 Quinquennial Review (QQR) submission, which were subsequently reviewed for the Radioactive Waste Inventory 2013. They represent areas of known contamination with long-lived alpha-emitting radionuclides. It is envisaged that only the alpha-contaminated land will require extraction and appropriate disposal on closure of AWE Aldermaston. Following the data collection exercises for the 2007 QQR submission, a further 109,750 m³ of land was identified as having the potential to be contaminated. The majority of the volume is directly associated with current process buildings and it is envisaged that further investigation of these areas will only occur following decommissioning. The 2013 Integrated Waste Strategy[99] indicates this is closer to 72,000m^3 of very low level contaminated soil on the AWE Aldermaston site.

9.1.28 A further report[100] by the Nuclear Decommissioning Authority covers this in greater detail, and suggests that 90% of contaminated land nationally is potentially contaminated VLLW soil from site clearance at Sellafield. AWE document the quantities generated at their sites in an Integrated Waste Strategy, although this is not updated annually so it is not possible to provide trend data as per the format used for the other waste streams covered in this report. The most recent Integrated Waste Strategy for AWE is March 2013.

9.1.29 It is reported within the Quinquennial Review[101], produced by AWE, and the underpinning data[102] which documents the predicted pre treated waste arisings for AWE Aldermaston for 2012/13 shows the following:

Table 9.7[103]

Waste category	2012/13 (m^3)
Very Low Level Waste	108
Low Level Waste	825
Intermediate Level Waste	120
High Level Waste	n/a

9.1.30 The following table has been taken from the Quinquennial Review, produced by AWE, and the underpinning data which provides an example of the pattern of use of existing disposal routes for the waste arising at AWE Aldermaston during 2012/13. These figures have been provided in tonnes as radioactive waste is often compacted to minimise volume for disposal.

[98] https://ukinventory.nda.gov.uk/wp-content/uploads/sites/18/2014/04/7A33.pdf
[99] AWE Integrated Waste Strategy, March 2013. Issue 1.
[100] https://ukinventory.nda.gov.uk/wp-content/uploads/sites/18/2014/02/14D043_NDASTSTY140013_-_Radioactive_Wastes__Materials_Not_Reported_in_the_2013_UK_Radioactive_Waste_Inventory.pdf
[101] http://www.onr.org.uk/documents/2013/quinquennial-review-awe.pdf
[102] 2012 Quinquennial Review: Submission supporting the AWE Decommissioning Strategy, Atomic Weapons Establishment, December 2012 and the underpinning data
[103] 2012 Quinquennial Review: Submission supporting the AWE Decommissioning Strategy, Atomic Weapons Establishment, December 2012 and the underpinning data

Table 9.8[104]

Category	Very low level waste	Low Level Waste	Intermediate Level Waste	High Level Waste
Reuse (Off-site laundering of coveralls)	2te	-	-	0
Recycle (Typically off-site metal recycling following decontamination)	-	179te	-	0
Recovery (Typically off-site processing of contaminated oils)	-	0	-	0
Off-site Incineration (With energy recovery)	0	-	-	0
Off-site Incineration (no energy recovery)	1te	-	-	0
Off-site (LLW to Conventional Permitted Landfill)	0	0	-	0
Supercompaction then Low Level Waste Repository in Cumbria	-	180te	-	0
Low Level Waste Repository in Cumbria	-	70te	-	0
On-site Storage at Aldermaston	-	-	53te	0

9.1.31 AWE Aldermaston has confirmed that the majority of the radioactive waste disposed under its Radioactive Substances Environmental Permit takes place through a contract the Ministry of Defence holds with Low Level Waste Repository Ltd. This contract allows access to a framework of service providers in the United Kingdom and internationally. In addition AWE holds separate contracts with Inutec Ltd (based at Winfrith in Dorset), National Nuclear Laboratories (based at the Springfields Nuclear Site in Preston) and Tradebe Ltd (operator of the HTI based at Fawley). AWE has also confirmed that it expects to be able to access new waste processing opportunities as they are introduced, through the framework contract operated by Low Level Waste Repository Ltd.

9.1.32 With the exception of the AWE Aldermaston and Burghfield sites, there are no other known sources of notable quantities of radioactive waste arising within West Berkshire.

9.2 Radioactive waste forecasting

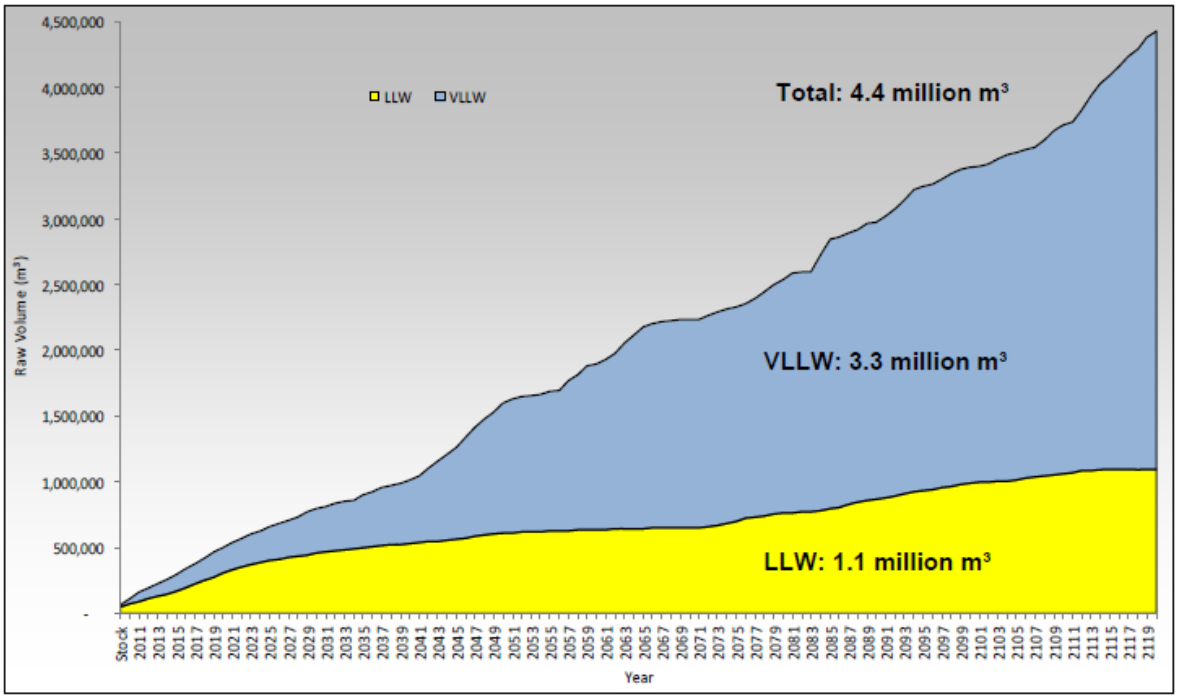
9.2.1 Currently there are no facilities available to dispose of intermediate and high level waste at a national level, and this is a matter currently being progressed by central government. The main focus of this section is therefore on the future management of the low level radioactive waste stream. Details are provided for all types of radioactive waste generated at AWE Aldermaston, it being the primary production site in West Berkshire (the quantities of waste generated at AWE Burghfield are aggregated with AWE Aldermaston by AWE for reporting purposes).

Forecasting of Very Low Level and Low Level waste arisings for United Kingdom

9.2.2 The Low Level Waste Repository report[95] indicates that a total raw volume of around 4.4 million m^3 of Low Level Waste and Very Low Level Waste is forecast to be generated up to 2120, the current end date of the Nuclear Decommissioning Authority's decommissioning programme. Once conditioned and packaged this waste is expected to increase to 4.5 million m^3. The projected cumulative quantities of future arisings to 2119, at the national level, are shown in the following graph.

[104] 2012 Quinquennial Review: Submission supporting the AWE Decommissioning Strategy, Atomic Weapons Establishment, December 2012 and the underpinning data

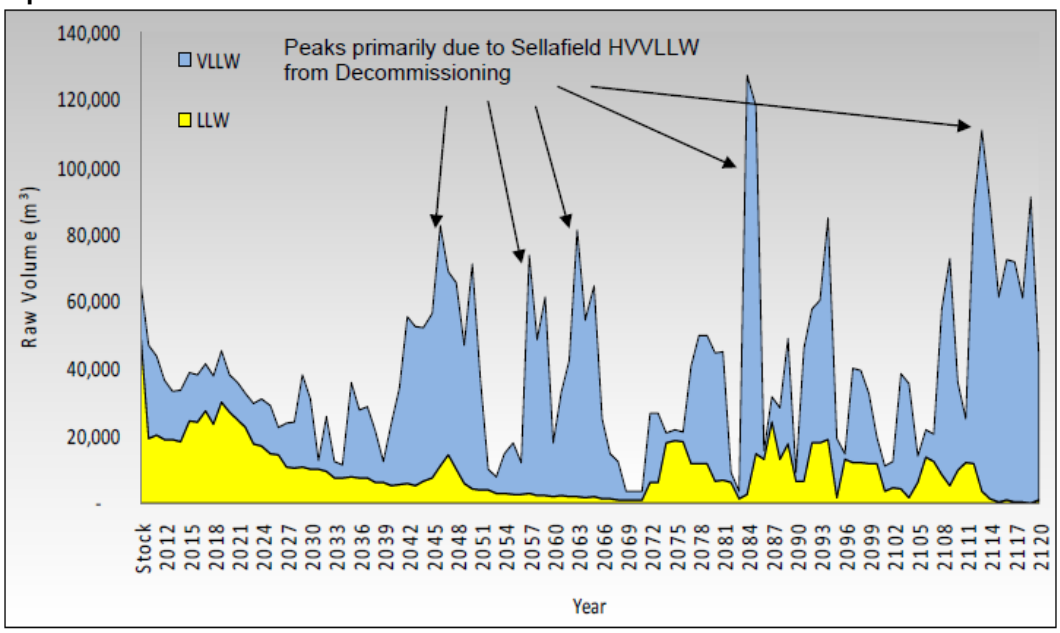
Graph 9.3[95]



9.2.3 The actual production of arisings for the United Kingdom is not constant and shows significant peaks and troughs, as shown by the following graph (9.4). The LLWR report[95] states that over the next 20 years the rate of Low Level Waste generation is expected to peak between 10,000 and 30,000m^3 per year. Following this between 2030 and 2080, Low Level Waste production is expected to drop to an average of approximately 6,000m^3 per year. Subsequent peaks of Low Level Waste arisings are forecast to occur due to final decommissioning and site clearance, before tailing off to zero at 2120.

9.2.4 For Very Low Level Waste the predicted trend is similar to Low Level Waste up to 2025, beyond which several peaks of Very Low Level Waste arisings are forecast, due to decommissioning activities at Sellafield. Sellafield Ltd (including Capenhurst) is forecast to contribute over a third of the total Low Level Waste and the vast majority of Very Low Level Waste (about 90%). This is shown in the Low Level Waste Inventory where the North West accounts for almost a third (380,000te) of the total Low Level Waste. Sites within Scotland and South West region are also forecast to produce significant proportions of arisings, totalling 422,000te between them or 36% of the total Low Level Waste materials inventory. The graph below shows the year on year raw arisings for both Very Low Level Waste and Low Level Waste anticipated in the United Kingdom over the next 100 years and beyond.

Graph 9.4[95]

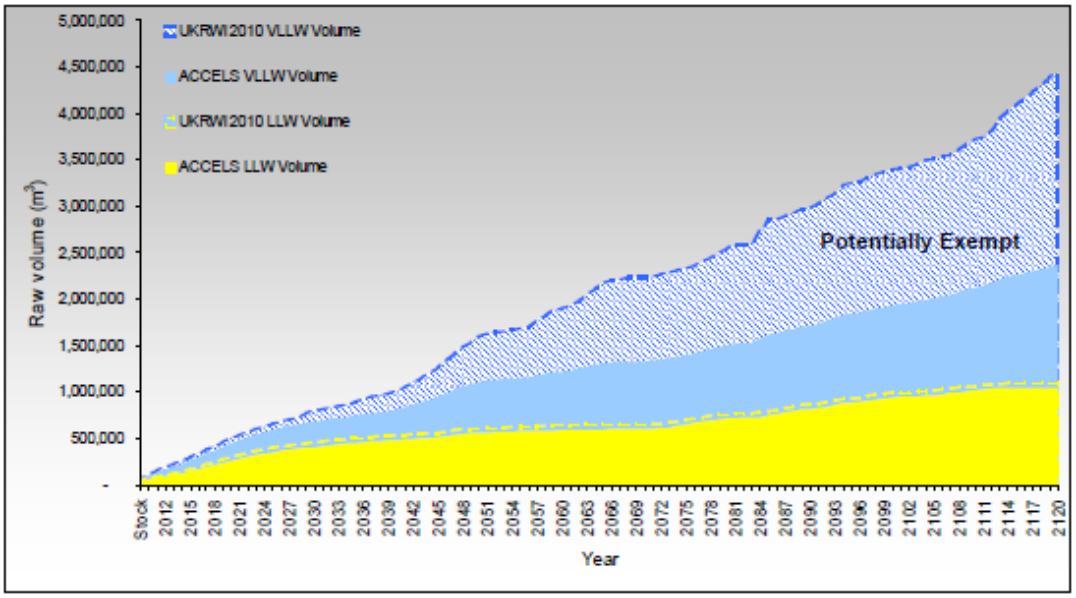


9.2.5 Since these estimates were generated, in 2010, one of the producers of radioactive waste, Magnox, has reviewed the waste generation from their sites. Once completed Magnox recategorised the proposed method of disposal for some wastes. This assessment is available in more detail within the SMART inventory review[105]. The results of this review is estimated to lead to a 45% decrease of wastes from the sites operated by Magnox during the care and maintenance preparations phases of their sites and is likely to have an impact until the end of final site clearance. These are relatively small quantities when compared to the total cumulative raw arisings of United Kingdom's estimated low level and very low level wastes. However, as a result of this review a decrease of 49,000m^3 of low level waste was estimated until 2020 and a decrease of 12,956m^3 for very low level wastes was also identified.

9.2.6 Since this review by Magnox, Sellafield has also undertaken a similar review of their wastes. This involved consideration of the impacts proposed by the exemptions of some of the waste streams. The report concluded that such exemptions could have implications for up to 70% of the waste arisings at Sellafield, which is marked on the following graph as 'potentially exempt waste'. The reductions from the Magnox review are also shown on this graph. As such, an overall reduction of 2.1 million m^3 of low level and very low level waste could result from these exemptions when compared to the total of 4.4 million m^3 declared in the 2010 waste inventory.

[105] SMART Inventory. Summary Report. Magnox North, Magnox South. MES/EST/GEN/REP/0006/10. Issue 1. September 2010.

Graph 9.5[95]

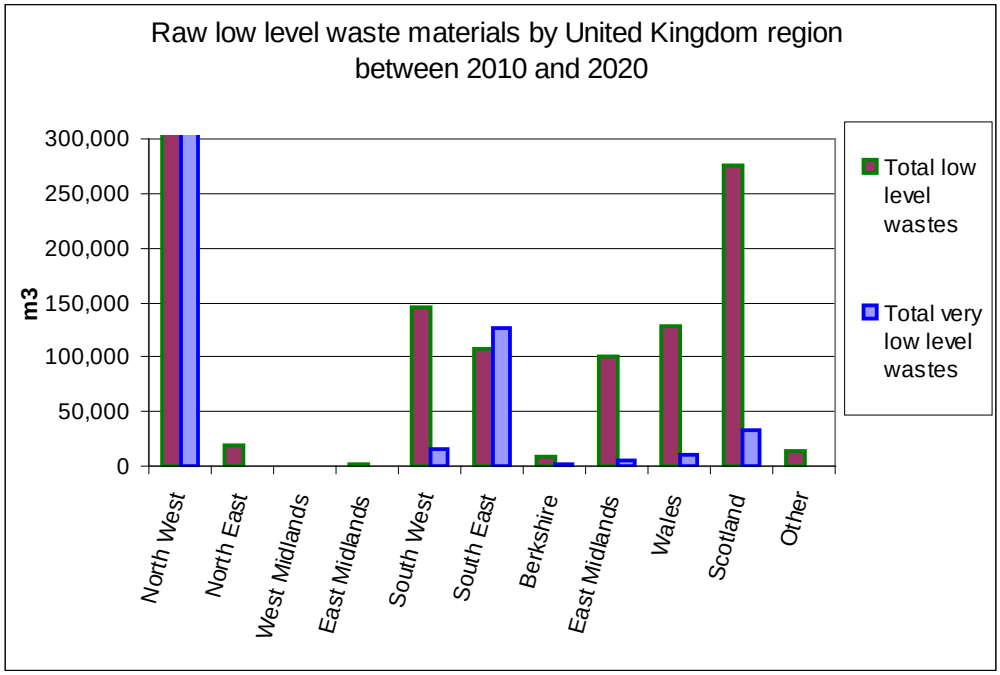


9.2.7 As a result of these recategorisations, the ACCELS (Acceleration of Element 2 Strategy) programme has been proposed. This will involve site targeted reviews across the Nuclear Decommissioning Authority and Non- Nuclear Decommissioning Authority estate with in depth analysis of inventory data. It is also proposed to include the identification and evaluation of 42 specific opportunities to reduce the cost of lifetime plan baselines across the Nuclear Decommissioning Authority estate. These opportunities include improved inventory and waste forecasts, use of consistent waste routing assumptions and cost factors, and targeted reductions in capital spend through best use of onsite resources, the supply chain, and economies of scale across the estate.

Forecasting of Very Low Level and Low Level waste arisings in the south east and Berkshire

9.2.8 The following graph shows the estimated quantities of low level and very low level waste predicted to arise within each sub national area, as well as in Berkshire. The detailed figures are available in appendix vi.

Graph 9.6[95]



9.2.9 As can be seen on the above graph, the Low Level waste strategic review report estimated that, in 2010, approximately 107,857m^3 of low level waste and 125,849m^3 of very low level waste arose in

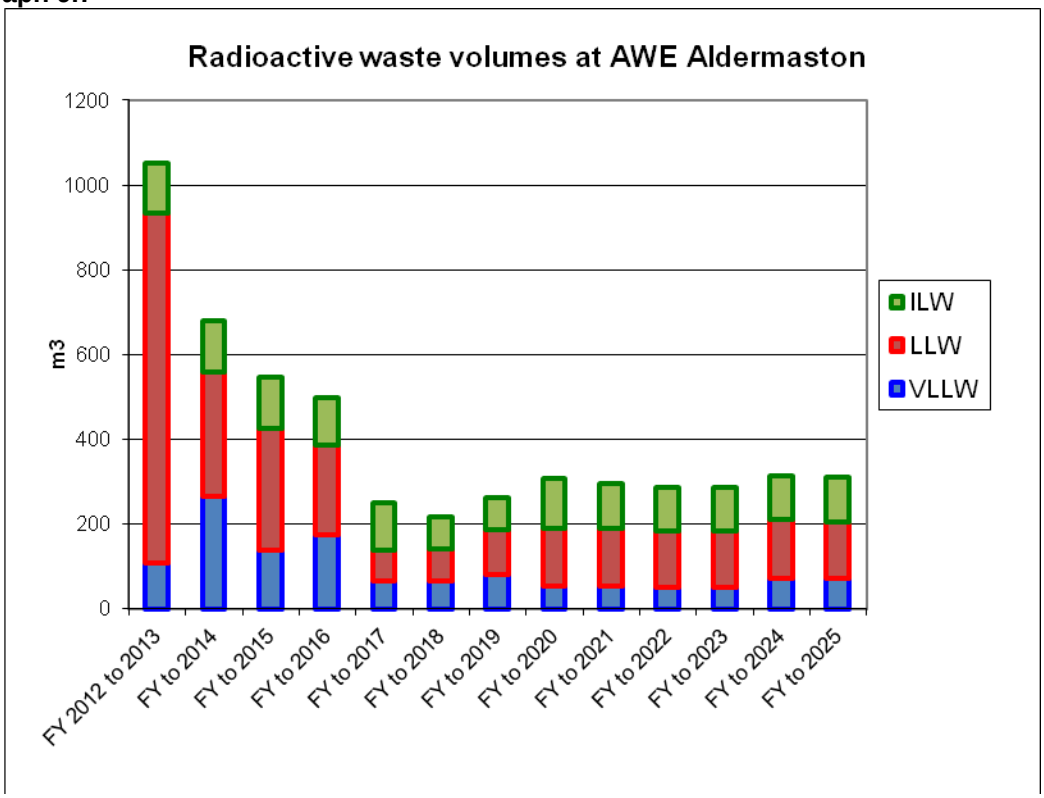
the south east region. The totals for the north west region are not shown due to the distortion that this would cause to the graph. For completeness, the total quantities of low level waste arisings projected to arise in the north west is 380,561 tonnes and the total projected quantities of very low level raw waste quantities is 3,281,135 tonnes.

9.2.10 The figures for the south east have been broken down to the former county of Berkshire, which is estimated to generate 9,096m^3 of low level waste and 1,026m^3 of very low level waste between 2010 and 2020. Using these figures it is possible to calculate that, in 2010, Berkshire was estimated to generate 0.002% of the total low level and very low level raw waste quantities within the United Kingdom. In national terms, proportionally this appears to be a very small quantity of waste.

Future arisings of Very Low Level and Low Level waste in West Berkshire.

9.2.11 The 2012 Quinquennial Review and the underpinning data provides the following year on year arisings for AWE Aldermaston, which generally shows a constant production of very low level, low level and intermediate level wastes from approximately 2017 onwards, as shown in the following graph and in appendix vii.

Graph 9.7 [106]



9.2.12 In addition, with regard to potentially contaminated land, the future arisings in table 9.6 earlier in this section are based on the figures calculated as part of the 2012 Quinquennial Review (QQR) submission, which were then subsequently reviewed for the Radioactive Waste Inventory 2013. They represent areas of known contamination with long-lived alpha-emitting radionuclides. It is envisaged that only the alpha-contaminated land will require extraction and appropriate disposal on closure of AWE Aldermaston. Following the data collection exercises for the 2007 QQR submission, a further

[106] 2012 Quinquennial Review: Submission supporting the AWE Decommissioning Strategy, Atomic Weapons Establishment, December 2012 and the underpinning data
Please note that it is difficult to trace the consigned volume to the disposal volume. For example, AWE may consign an ISO freight container containing up to 72 drums of LLW to the LLW compactor operated on behalf of LLWR where the volume is reduced by a factor of 5. The compacted drums are then loaded into a disposal container [typically a half height ISO container] and grouted before placing in the LLWR vault. So for this reason the quantities stated should be treated with caution

109,750 m³ of land was identified as having the potential to be contaminated. The majority of the volume is directly associated with current process buildings and it is envisaged that further investigation of these areas will only occur following decommissioning. The 2013 Integrated Waste Strategy[107] indicates that this is closer to 72,000m^3 of very low level contaminated soil on the AWE Aldermaston site.

Summary of future forecasting for the radioactive waste stream

9.2.13 To ensure that the future management of radioactive waste arisings are accounted for within the chosen waste management strategy for West Berkshire, the most recently available projected figures stated as currently arising at AWE Aldermaston have been taken to be the likely levels of arising for the whole Plan Area in this Local Waste Assessment.

9.2.14 It is understood that this data is reviewed annually as part of the Integrated Waste Strategy for AWE Aldermaston, however an updated version of this Strategy has not been made available at this stage, therefore the most recent available IWS is from 2013. During the plan-making process, if further data is made available or if other sources of radioactive waste arisings are identified, then these will also be factored into this local waste assessment.

9.2.15 No sites have been put forward by developers for inclusion in the emerging MWLP specifically for the management of radioactive waste. It is acknowledged that HLW and ILW require specialist management, and therefore at this point in time and throughout the plan period, it is unlikely that West Berkshire would host waste management sites that would undertake the final management of these streams. Subject to all planning and environmental considerations, there could potentially be VLLW managed through incineration or landfill (although this is considered less likely) throughout the plan-period. It is also possible that facilities may be required to aid in the transfer or stabilisation of waste prior to final management at another location.

[107] AWE Integrated Waste Strategy, March 2013. Issue 1.

10.1 Sewage Sludge waste arisings

10.1.1 Sewage sludge is a natural by-product of the wastewater treatment process and with a general growth in population and housing anticipated it is relevant to consider sewage sludge in this Local Waste Assessment. Sewage sludge is the residual organic matter and dead bacteria used in the treatment process or biosolids removed from the waste water being treated. An overview of this process is detailed in appendix viii.

10.1.2 Sewage sludge management can involve the management of either raw or treated material through a range of routes. There are also different controls that govern the treatment of different types of sewage sludge, depending on whether it is classified as non hazardous waste or hazardous waste requiring treatment and disposal.

10.1.3 The Environment Agency states that approximately 3 to 4 million tonnes of sewage sludge is applied to land each year[108]. Sewage sludge has been used as a fertiliser on farmland for many years and is not classified as controlled waste, when tested, supplied and used in accordance with the Sludge (Use in Agriculture) Regulations[109]. Schedules 1 and 2 of the Regulations specify what the sludge and soil need to be tested for and the limits for metal content. The *Safe Sludge Matrix*, (ADAS)[110] and the *Safe Sludge Matrix for industrial crops*, (ADAS)[110] provide guidance on best practice on the minimum levels of treatment sewage sludge should undergo before it can be applied to different types of crop. The Environment Agency states that if sewage sludge or septic tank sludge is to be spread to non-agricultural land, an environmental permit must be in force.

10.1.4 It should be noted that DEFRA have also produced guidance for the protection of water, soil and air[111] in relation to good agricultural practice for farmers, growers and land managers. There is also a document by DEFRA which details the *Code Of Practice For Agriculture Use Of Sewage Sludge*[112].

10.1.5 The Urban Waste Water Treatment Directive[113] came into effect in 1991 stipulating higher standards of waste water treatment, and it is presumed that this has resulted in the generation more sludge. This Directive also prohibited the discharge of sewage sludge to surface waters through pipes or disposal from ships at sea by 31 December 1998, and since then alternative re-use or disposal routes have been used. The Sewage Sludge Directive[114] originally came into effect in 1986 and was most recently amended in 2003. It seeks to encourage the use of sewage sludge in agriculture and to regulate its use in such a way as to prevent harmful effects on soil, vegetation, animals and man, although due to the age of this directive this is currently being reviewed[115]. The Water Framework Directive[116] is relevant to how this waste is managed and the related impacts. It was introduced originally in 2000 and consolidated in 2008. It aims for 'good status' for all ground and surface waters (rivers, lakes, transitional waters, and coastal waters) in the EU.

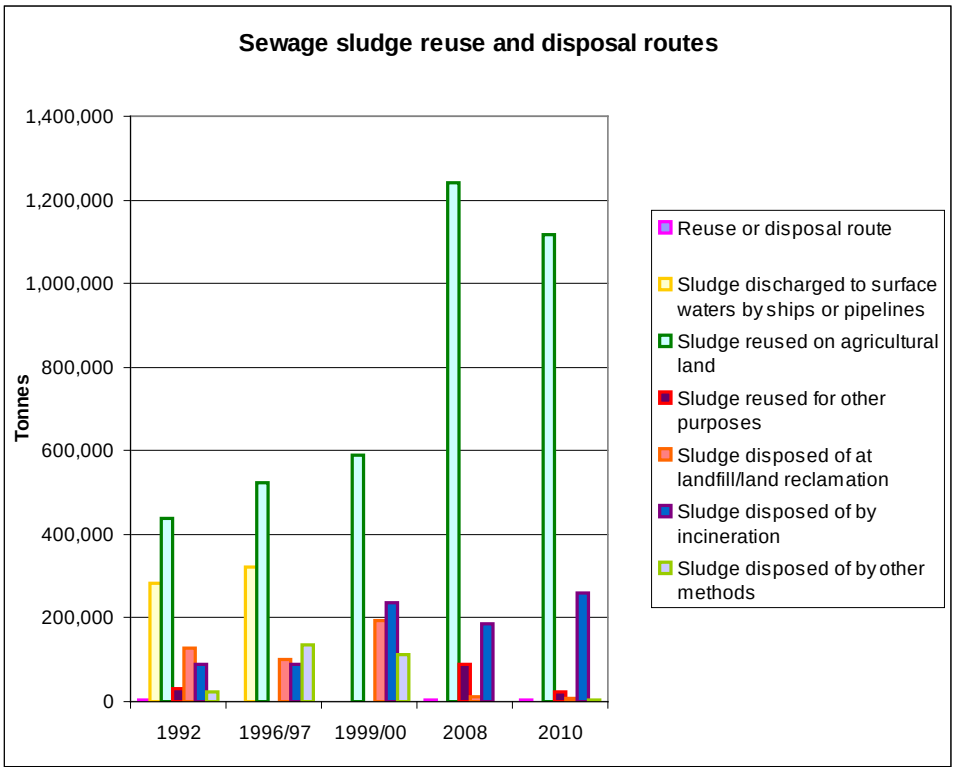
10.1.6 The total organic material managed by placement on agricultural land in United Kingdom steadily increased from 2002 to 2008. Use of sewage sludge as a soil enhancer and fertiliser on agricultural land remains the favoured option, with around 80% of such material being applied to agricultural land in 2012.

10.1.7 The following graph shows the changes to reuse and disposal routes used to manage sewage sludge in the United Kingdom, where the recent trends are compared to the baseline of 1992. This shows generally declining trends in the use of landfill or land reclamation for the disposal of sewage sludge, potentially partly driven by increases in landfill tax. This has been offset by a general

[108] http://www.environment-agency.gov.uk/business/sectors/130187.aspx
[109] http://www.legislation.gov.uk/uksi/1989/1263/contents/made
[110] http://adlib.everysite.co.uk/adlib/defra/content.aspx?doc=94726&id=94727
[111] http://adlib.everysite.co.uk/adlib/defra/content.aspx?doc=252412&id=252413
[112] http://adlib.everysite.co.uk/adlib/defra/content.aspx?doc=4196&id=247164
[113] Urban Waste Water Treatment Directive 91/271/EEC http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31991L0271:EN:NOT
[114] Sewage Sludge Directive 86/278/EEC http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31986L0278:EN:NOT
[115] http://ec.europa.eu/environment/waste/sludge/index.htm
[116] http://ec.europa.eu/environment/water/water-framework/index_en.html

increase in the amounts of sludge disposed of by incineration and the significant increase in sludge applied to agricultural land. Increasingly the sewage sludge generated from treatment processes has undergone anaerobic digestion reducing the residual sewage solids that need to be disposed of, while generating biogas, a renewable energy source. For the specific data, see appendix ix.

Graph 10.1.1[117]



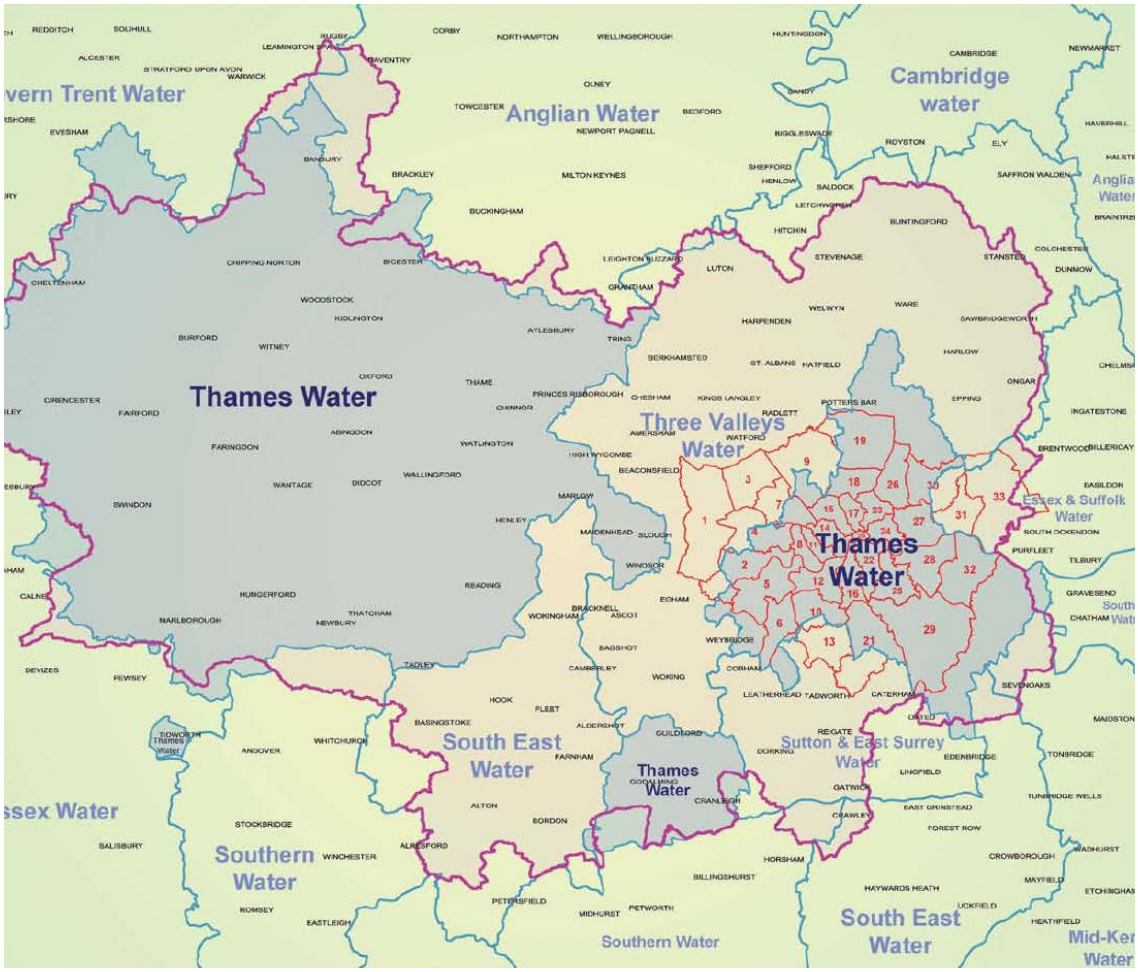
Sewage sludge in West Berkshire

10.1.8 Thames Water is the private utility company responsible for wastewater treatment within the West Berkshire area, and it is the UK's largest water and wastewater services company. Every day it removes and treats more than 4 billion litres of sewage for 14 million customers. In the spirit of 'Duty to Cooperate', in order to acquire more information about this waste stream, and also to establish whether or not there was an issue in terms of plan-making, officers met with Thames Water subsequent to the previous LWA (December 2013) being published. Information acquired from Thames Water at this meeting has supplemented the information available to WBC, and informed this section of the LWA.

10.1.9 The data published by Thames Water is generally for the whole of the Thames Water supply area and not disaggregated to specific administrative areas. The Thames Water supply area is much larger than West Berkshire alone, as shown on the map below.

[117] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69592/pb13811-waste-water-2012.pdf
Sewage treatment in the UK, DEFRA, 2002
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69582/pb6655-uk-sewage-treatment-020424.pdf

Map 10.1.1 [118]



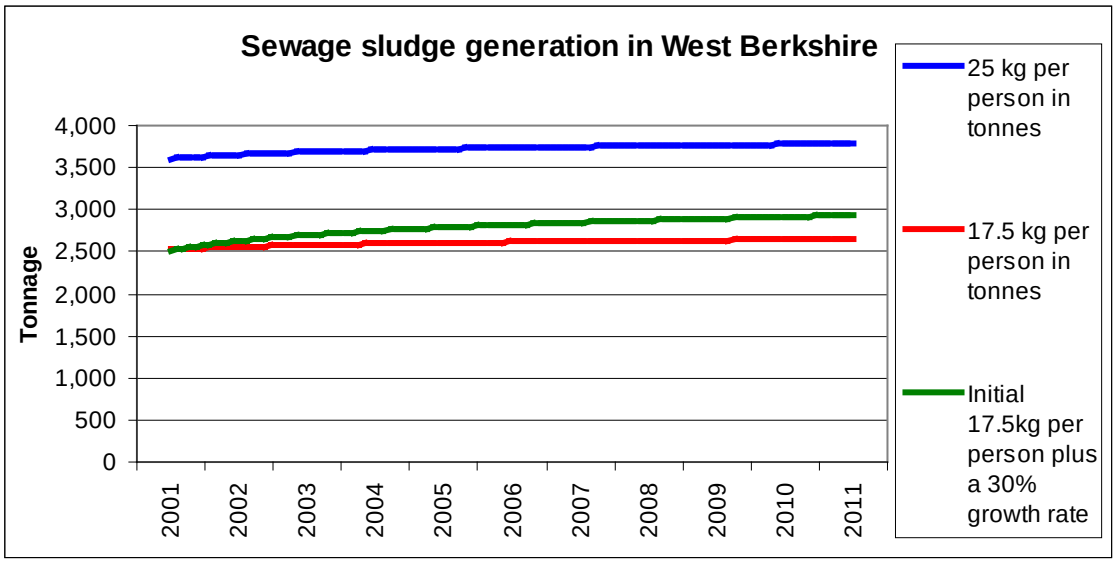
10.1.10 There are 32 sewage treatment works in West Berkshire and one sludge management centre, located in Thatcham (known as the Newbury Sewage Treatment site). At present the sludge management centre includes a lime stabilisation unit that is used to treat the sewage sludge prior to the dewatering process with the dried sludge being spread on farm as a soil improver (primarily in West Berkshire and north Hampshire). However the long term intention is to cease this practice at the Newbury site (lime stabilisation) and instead dewater the sludge and export the dewatered sludge (cake) to another facility for energy recovery with the residues from this treatment process being transported back to be spread on farm land in West Berkshire and north Hampshire.

10.1.11 Thames Water has indicated through DTC that it is likely that the Newbury site will remain operational, acting as the 'central hub' for all the sludge collected from the local sewage treatment works, and play a vital de-watering role with the associated bulking up of the sludge and necessary transportation. It has been indicated that it is unlikely that the site would be expanded or the throughput significantly increased in the near future.

10.1.12 The previous LWA (December 2013) used estimated annual quantities of waste generated per person which were taken from the *European environmental, economic and social impacts of use of sewage sludge on land report*[119]. The 3 factors that were used were 17.5kg, 17.5kg plus a 30% growth rate, and 25kg. Graph 10.1.2 shows the estimates that were made for the quantities of sewage sludge arising in West Berkshire by multiplying the annual kg quantities by the population figures for West Berkshire. The worst case scenario is based upon West Berkshire having a "high connection rate to sewerage and high level of treatment complying with the Urban Waste Water Treatment Directive", while the second projection is based upon West Berkshire requiring significant improvements to comply with the Urban Waste Water Treatment Directive.

[118] Thames Water website, 2013
[119] http://ec.europa.eu/environment/archives/waste/sludge/pdf/part_ii_report.pdf

Graph 10.1.2[120]



For the detailed figures for these projections, please view appendix x.

10.1.13 In the spirit of 'Duty to Cooperate', in order to acquire more information about this waste stream, and also to establish whether or not there was an issue in terms of plan-making, officers met with Thames Water subsequent to the previous LWA (December 2013) being published. It was agreed that the worst case scenario for sludge production (which was based on 25 kg per head of population per annum) would be a reasonable basis to plan for. Therefore it was agreed that the worst case estimates of arisings in the LWA at 3,809 tpa at 2011, were reasonably accurate.

Chosen baseline for sewage sludge generation

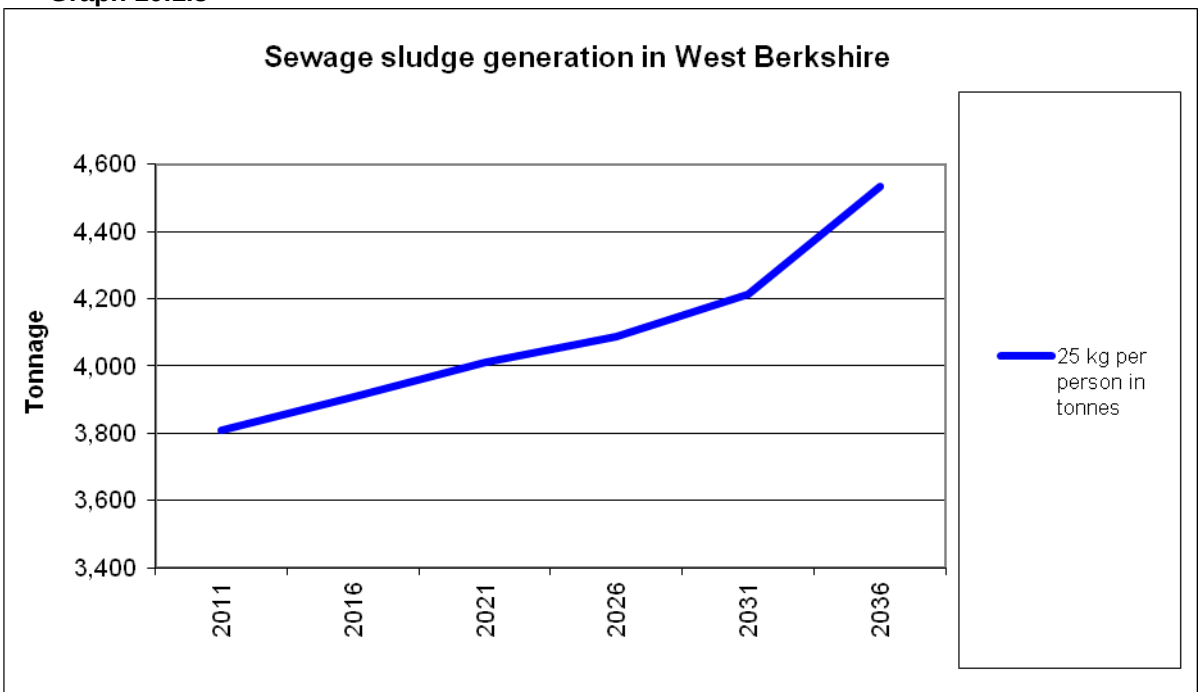
10.1.14 The only actual data available for sewage sludge arisings is for the whole area covered by Thames Water which, as discussed, is significantly larger that West Berkshire. However based on sewage sludge production on average per person being in the region of 25kg annually, levels of arisings in 2011 were approximately 3,809 tonnes. Thames Water has indicated that it is in agreement with this, and the minutes of the relevant meeting between WBC and Thames Water will form part of the Duty to Cooperate Statement that will support the emerging plan.

10.2 Future projections of sewage sludge arisings for West Berkshire.

10.2.1 As described above the projected arisings figures that were derived by multiplying the 25kg waste figure by the projected population estimates for West Berkshire were deemed to be broadly accurate when compared to Thames Water's projections. The following graph therefore projects future arisings of sewage sludge in West Berkshire using these assumptions. For the detailed figures for these projections, please view appendix x.

[120] Based upon : http://ec.europa.eu/environment/archives/waste/sludge/pdf/part_iii_report.pdf and Berkshire Observatory population projections, 2011

Graph 10.1.3[121]



10.2.2 Based on 25kg of waste per head of population multiplied by the population estimates to 2036, the projected arisings will increase by approximately 19% over the projected plan period. Thames Water is in agreement that reasonably accurate figures can be derived using this methodology.

10.2.3 **Key plan-making issues arising from Duty to Cooperate Meeting with Thames Water**

- It was agreed by Thames Water that the worst case estimates and projections of arisings in the LWA (December 2013) were relatively close to the projections produced by Thames Water. WBC's estimates for the West Berkshire area were 3,809 tpa in 2011 and 4,533 tpa in 2036, while Thames Water's projections were 4,287 tpa in 2016 and 4,644 tpa in 2036.
- It was confirmed by Thames Water that, on the basis of its current projection estimates, no new sewage treatment facilities would be required to be built in West Berkshire over the projected plan period.
- Thames Water supports the inclusion of criteria based policies relating to the sewage waste stream

Analysis

10.2.4 In terms of how West Berkshire's sewage sludge will be managed in the future, there appears to be a move away from the recycling of sewage sludge into a soil improver, to the recovery of renewable energy. This is due to a number of reasons, including regulatory factors and the impending shortfall of land to deposit processed sewage sludge on. There is also a focus on removing water from the sewage sludge to reduce the volumes deposited on land and to reduce transport movements.

10.2.5 Although in theory energy recovery sits below recycling in the Waste Hierarchy, recycling of sewage sludge into soil improver requires mixing of lime into the material resulting in odour issues and increasing its volume, hence requiring an increased number of vehicle movements to transport the material. There are also potentially negative impacts from nitrates and phosphates leaching into groundwater as a result of deposition of sewage sludge on agricultural land. The use of the material to generate renewable energy, although it can have its own negative impacts, is considered to be a positive move in terms of sustainability.

[121] Based upon: http://ec.europa.eu/environment/archives/waste/sludge/pdf/part_iii_report.pdf and Berkshire Observatory population projections, 2011, please see appendix i.
Note – Thames Water has confirmed that these estimates/projections are broadly accurate in comparison to its projections

10.2.6 As described above, Thames Water agreed that WBC's projections were reasonably accurate so in terms of planning for capacity during the plan-period WBC is satisfied that these figures are a robust basis. Thames Water has confirmed that on the basis of its current projections (which are very similar to those of WBC), no new sewage treatment facilities would be required to be built in West Berkshire over the projected plan period. The utility provider has also indicated that a criteria based policy approach would be supported and this fits with the approach that has been taken in the Preferred Options for the MWLP.

11.1 Equine Waste Arisings

11.1.1 The generation and management of the 'equine waste stream' is not normally considered to be a strategic planning matter. However, it is recognised that in West Berkshire there is a significant horse population due to the presence of both the racehorse industry and the recreational equine industry. West Berkshire has been a famous training area for over 150 years, and is the second largest racehorse training area in Britain, after Newmarket. It was therefore considered prudent for this Local Waste Assessment to consider this waste stream in more detail to ascertain whether it requires management in a strategic manner.

11.1.2 The Environment Agency states that an estimated 90 million tonnes[122] of manure and slurry is applied to land each year. Manure and slurries have been used as fertiliser on farmland for many years and are not classed as waste when used in this way, however, they can cause pollution if they are not stored and spread carefully. The storage and spreading of manures and slurries is also subject to other controls such as the *Nitrate Pollution Prevention Regulations* (which refer to Nitrate Vulnerable Zones)[123] and the *Silage Slurry and Agricultural Fuel Oil Regulations* (SSAFO)[124]. Good practice documents are available[125] such as: *The Code of Good Agricultural Practice* (COGAP) for the protection of water, soil and air. COGAP recommends that manure and slurry should not be applied to land in a number of circumstances, such as when the soil is waterlogged, frozen, covered in snow or when the soil is cracked down to field drains or backfill or when the field has been pipe, mole drained or subsoiled over drains in the last 12 months, or when heavy rain is forecast within the next 48 hours.

11.1.3 The DEFRA website[126] indicates that, horse manure, while subject to certain controls, is not considered waste if all of the following apply:

"if it is used as soil fertiliser, that use is part of a lawful practice of spreading on clearly identified parcels of land, its storage is limited to the needs of those spreading operations to be carried out on agricultural holdings, whether yours or another's".

11.1.4 The spreading of such material on agricultural land may constitute an agricultural practice and therefore, in most cases, does not constitute development requiring express planning consent. Horse manure and bedding may be composted, but before setting up a composting operation, the site must be registered with the Environment Agency, although it may not need an environmental permit.

11.1.5 The DEFRA website indicates that suitably licensed facilities must be used to dispose of solid waste from the equine industry which may include items such as: contaminated bedding, food containers, empty pesticide and other chemical containers, plastics such as silage wrap, bags and sheets, tyres, batteries, clinical waste, old machinery and oil. Some of this waste, particularly that which would not readily decompose, would be captured within the commercial and industrial waste stream. If manure is transported directly to agricultural land and applied there it is unlikely to be classed as waste in planning terms, however if the material is taken to a licensed composting (or other form of treatment) site it is likely to be considered as waste material. Clinical waste, such as from horse veterinary activity is defined as hazardous waste, and needs to be managed separately, likely through incineration. It would include items such as infected linen, bandaging, used syringes, empty medicine containers. Another possible form of equine waste is water from horse exercise pools which the Environment Agency advises should not be spread on land.

[122] http://webarchive.nationalarchives.gov.uk/20140328084622/http://www.environment-agency.gov.uk/business/sectors/130181.aspx
[123] https://www.gov.uk/guidance/nutrient-management-nitrate-vulnerable-zones
[124] http://webarchive.nationalarchives.gov.uk/20140328084622/http://www.environment-agency.gov.uk/business/sectors/118798.aspx
[125] http://webarchive.nationalarchives.gov.uk/20140328084622/http://www.environment-agency.gov.uk/business/sectors/32771.aspx
[126] https://www.gov.uk/keeping-horses-on-farms

Racehorse industry in Britain, the North Wessex Downs AONB, and West Berkshire

11.1.6 In the spirit of 'Duty to Cooperate', in order to acquire more information about this waste stream, and also to establish whether or not there was an issue in terms of plan-making, officers met with the Jockey Club subsequent to the previous LWA (December 2013) being published.

11.1.7 The Jockey Club is the largest commercial group in British horseracing, with assets including Cheltenham, Aintree, Epsom Downs and Newmarket racecourses. Jockey Club Estates is its property and land management arm, which operates the famous training grounds at Newmarket and Lambourn. Information acquired during the meeting with the Jockey Club has been used to supplement this section of the LWA.

11.1.8 The West Berkshire Core Strategy, July 2012, and related topic paper on Equestrian/racehorse industry, recognised that equestrian activities and related development and the racehorse breeding and training industries are characteristic features for the area and the North Wessex Downs Area of Outstanding Natural Beauty (AONB).

11.1.9 It is acknowledged that the North Wessex Downs AONB covers a much larger area than that which is within West Berkshire; however a major concentration of the livery activity within the AONB is acknowledged as being within West Berkshire and particularly the Lambourn Valley. A report[127] published by the North Wessex Downs AONB Management unit into the effects of the horseracing industry on the North Wessex Downs AONB identified that there were around 500 licensed trainers in Britain[127] and a further 200 permit holders, who may train their own horses or those of their immediate family. The main concentrations of trainers are at Newmarket, Lambourn (in West Berkshire), Malton and Middleton (in Yorkshire). This report suggests that, outside Newmarket, the greatest concentration of training yards is at Lambourn, known as the 'valley of the racehorse'.

11.1.10 The North Wessex Downs AONB Management report was supported by a survey which included 55 trainers, along with stud and livery yards, farriers, veterinary practices, horse feed suppliers and other horse racing industry related businesses. They are grouped in four main clusters around Lambourn, East Ilsley, Hungerford (all located in West Berkshire) and Marlborough, Wiltshire. The Lambourn cluster is the largest with 25 training yards, two stud farms, one livery yard, three veterinary surgeries, three horse feed merchants and 18 associated businesses. This is detailed within the map 11.1.1 below.

11.1.11 The report[127] states that Lambourn has six all-weather tracks as well as over 600 acres of traditional turf. It is estimated that between 700 and 800 people are probably directly employed in racing in the immediate vicinity of Lambourn (approximately half the population of Lambourn), with a similar number providing services to racing.

11.1.12 The North Wessex Downs AONB is understood to be home to around 10% of Britain's racehorse trainers[127]. Information about businesses associated with the racehorse industry in the North Wessex Downs AONB and Britain is provided below:

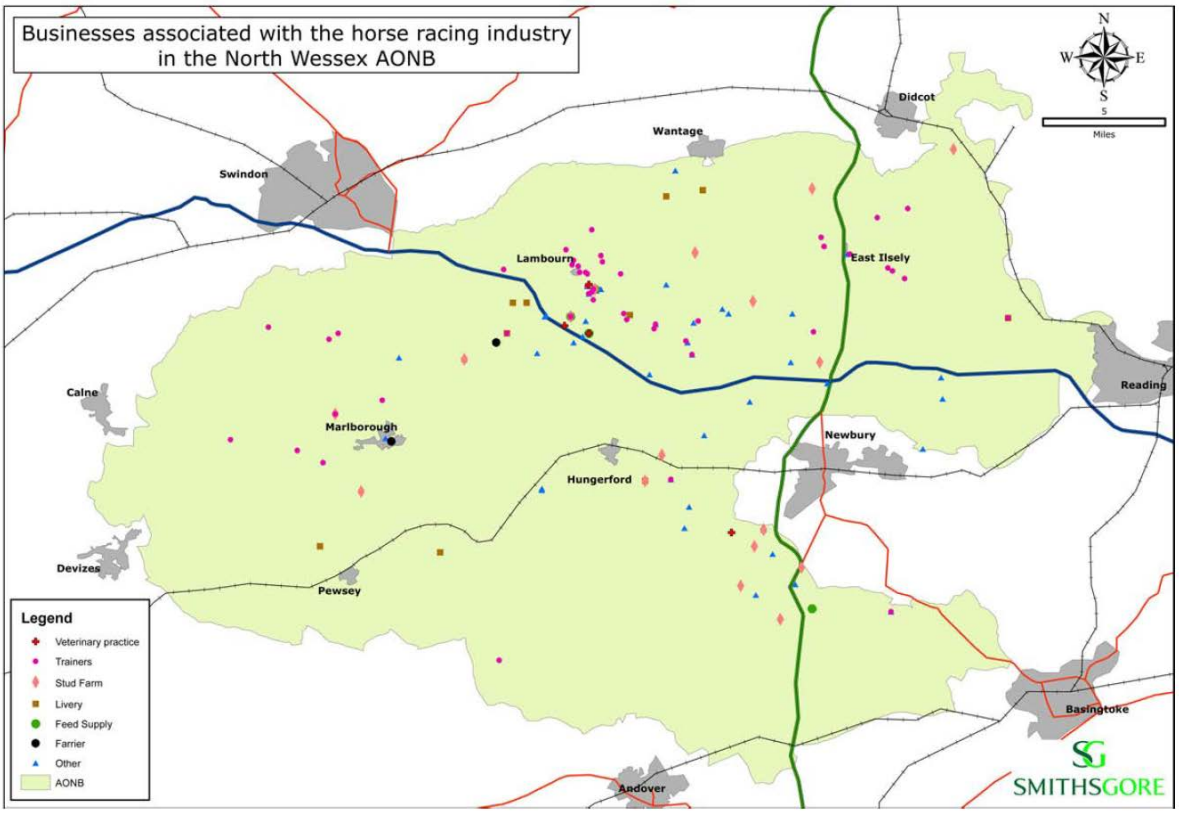
Table 11.1

Type of business	Within North Wessex Downs Area of Outstanding Natural Beauty		Within Britain	
	Number of racehorses	Number of businesses	Number of racehorses	Number of businesses
Trainer	1,974	55	13,900	574
Stud	1,476	23	12,273	2,200
Livery	288	9	22,000	1,971
Farriers	-	7	-	-
Horse feed and forage suppliers	-	5	-	-
Veterinary practices	-	4	-	-
Total	**3,737**	**103**	**48,173**	

[127] A study of the key effects of the horseracing industry on the North Wessex Downs Area of Outstanding Natural Beauty, March 2007, prepared by Kirkham Landscape Planning Consultants, the University of Ready, and Smiths Gore http://www.northwessexdowns.org.uk/uploads/docs/publications/Development_publications/Racing%20Industry%20Study%20-%20web.pdf

11.1.13 The Jockey Club has indicated that as at April 2014 there were roughly 1,362 racehorses in training in the Lambourn Valley, managed by 35 or 36 trainers (29 of which would use the Jockey Club gallops) and 5 or 6 of which would have access to their own gallops.

Map 11.1.1[127]



11.1.14 Approximately 30% of the North Wessex Downs Area of Outstanding Natural Beauty is located within West Berkshire. The remainder is located within Oxfordshire, Swindon. Wiltshire and Hampshire. If the distribution of racehorses were based on the amount of the North Wessex Downs Area of Outstanding Natural Beauty located within West Berkshire this would equate to approximately 1,121 horses. When compared to the approximate figure provided by the Jockey Club of 1,362 it can be seen that this is not too far way in terms of accuracy.

Equine waste from the leisure industry

11.1.15 The British Equestrian Trade Association National Survey 2011[128] states that there are an estimated 900,000 privately owned horses and 451,000 horse owners in Britain. This figure rises to just below 1 million, when the 88,000 horses owned by the professional sector are included.

11.1.16 A British Horse Industry Confederation (BHIC) publication on the Size and Scope of the Equine Sector[129] details the sources it has drawn on and provides estimates of 17 horses per 1,000 people and 4.3 horses for every square kilometre. The 2013 West Berkshire District Profile[130] indicates West Berkshire has a population of 153,822 (Census 2011) and covers an area of 272 square miles[131]. Using those values and the BHIC horse density estimates would suggest that the number of horses associated with the leisure industry in West Berkshire may be between 2,615 and 3,028.

[128] http://www.beta-uk.org/pages/trade/equestrian-industry-information/market-information.php
[129] British Horse Industry Confederation Briefing – Size and Scope of the Equine Sector; 1st October 2009 http://www.bhic.co.uk/downloads/sizescope.pdf
[130] http://info.westberks.gov.uk/CHttpHandler.ashx?id=34863&p=0
[131] Wikipedia indicates in to be 271.88 square miles, 704.17km^2.

11.1.17 The BHIC Briefing – *"Size and Scope of the Equine Sector"* also states that equine owner density has a specific geographical distribution and the map on the following page helps illustrate this.

11.1.18 A research article on the size and spatial distribution of the horse population within Great Britain[132] provides maps of the National Equine Database owner and stakeholder horse data at postcode area resolution. These maps indicate a horse density in West Berkshire of between 76 to 100 horses per $10km^2$, as shown below. Using that density suggests the number of horses in West Berkshire may be in the region of 5,351 to 7,041. This results in a much larger figure than that derived from the British Horse Industry Confederation estimates, although it is noted that this data does account for 35,841 horses registered for competition related pursuits (i.e. 16,010 Thoroughbred horses in race training (BHA); 10,055 Thoroughbreds used for breeding (Weatherbys) and 9,776 horses registered for British Eventing). As such this figure includes horses associated with the racehorse industry as well as the leisure industry.

11.1.19 The Surrey Horse Pasture Management Project[133] in its section on Manure storage and disposal advice states[134]

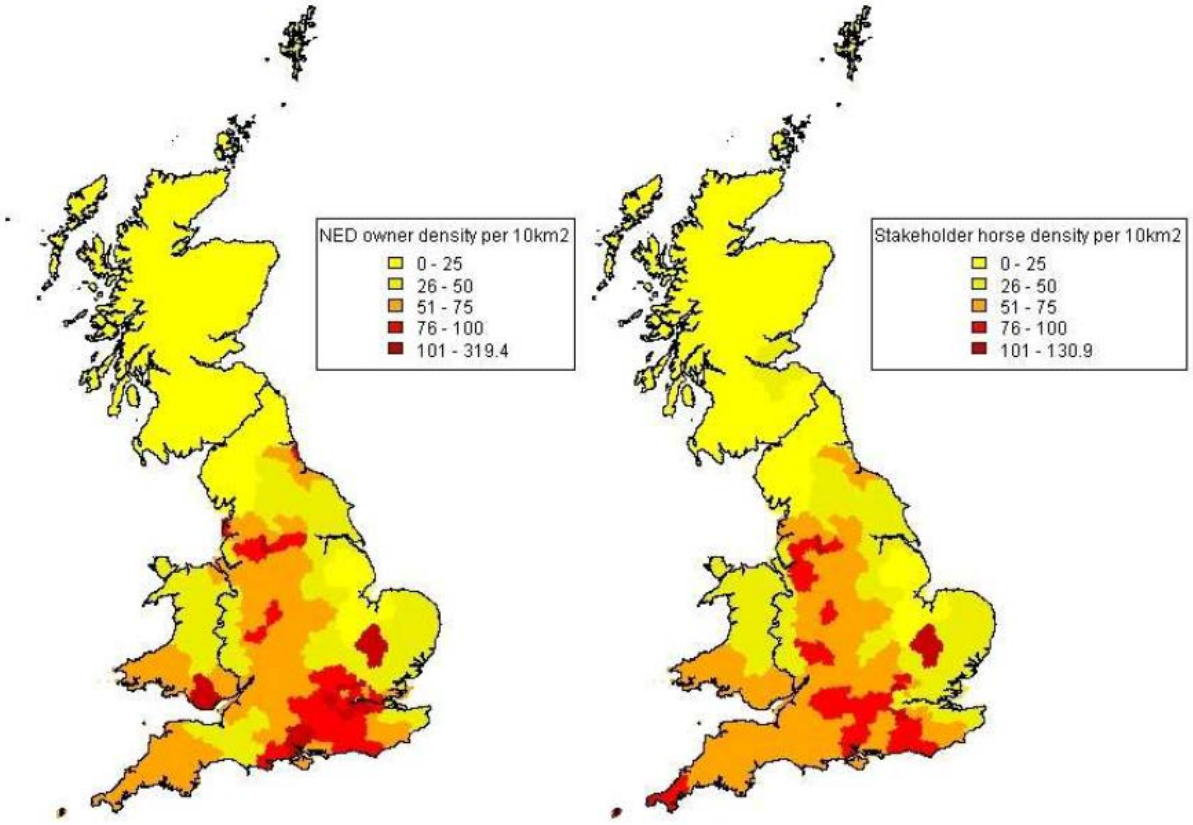
"An average horse will produce 20.4 kilos (or 45 pounds) of manure each day, equating to 7.5 tonnes annually. This quantity does not include the addition of soiled stable bedding material".

This annual tonnage figure is also supported by the *Cotswolds Conservation Board Equine Guidance Note Waste Management,* 2011[135].

11.1.20 Multiplying this annual figure of 7.5 tonnes of waste per horse per annum by the estimates of 5,351 to 7,041 horses in West Berkshire results in a possible 40,133 to 52,807 tonnes per annum of horse manure maybe generated in West Berkshire. This is in addition to other equine related wastes, such as contaminated bedding, food containers, empty pesticide and other chemical containers, plastics such as feed wrap, bags and sheets, tyres, batteries, clinical waste, and old machinery and oil. However it is expected that such wastes are managed as part of the commercial and industrial waste stream.

[132] 'Summary of current knowledge of the size and spatial distribution of the horse population within Great Britain', L.A. Boden et. al., 4th April 2012 http://www.biomedcentral.com/1746-6148/8/43
[133] Surrey County Council are the first in Britain to set up an advisory service on land management for horse keepers, resulting in a ten year pilot project
[134] https://www.surreycc.gov.uk/environment-housing-and-planning/countryside/looking-after-the-countryside/countryside-advice/horse-care-and-pasture-management/manure-storage-and-disposal-advice
[135] http://www.cotswoldsaonb.org.uk/userfiles/file/meetings%202011/c-and-m-meetings/c-and-m-16.6.11/agenda-item-12-appendix-a-ii-cotswolds-waste-management.pdf

Maps 11.1.2[136]



11.1.21 In the Lambourn area it is known that there is one main operator that takes receipt of horse manure and composts it. The last returns that were completed by the operator are from 2013 and these indicate that approximately 2,000 tonnes of horse manure was managed in that year and the maximum capacity would be approximately 4,000 tonnes. This demonstrates that if the estimates of arisings are accurate, in the region of 51,000 tonnes of manure is managed either outside of West Berkshire at sites that aren't monitored by WBC, or effectively outside the planning system. Due to the likely cost of transporting manure, it is unlikely that the material would travel far and therefore it is assumed that the majority is spread on land within West Berkshire and close to the border in Wiltshire and Oxfordshire. It is likely applied directly to land and would be considered to be an agricultural soil enriching activity.

Chosen baseline for equine waste

11.1.22 The Environment Agency Waste Data Interrogator (WDI) database for 2015 records the quantity of equine waste arising from West Berkshire as 0.12 tonnes[137]. This is further evidence to support the assumption that the material from this industry is managed in the main as a non-waste, and in terms of the WDI, managed outside the environmental permitting system.

11.1.23 When comparing the tonnage from this waste stream to that generated by the other waste streams generated within West Berkshire, the projected estimate of up to 52,807 tonnes per annum equates to approximately 7% of total waste arising in West Berkshire. However, the authority considers that the majority of this is likely to not enter the formal waste management system. It would be dealt with by spreading on land and therefore fall outside the planning process.

[136] National Equine Database (NED) 2010 http://www.biomedcentral.com/1746-6148/8/43
[137] Under European Waste Code (EWC) 02 01 06 applicable to 'animal faeces, urine and manure (including spoiled straw), effluent, collected separately and treated off-site.

11.2 Projected arisings of equine waste

11.2.1 **Key plan-making issues arising from Duty to Cooperate Meeting with the Jockey Club**

- The Jockey Club (JC) indicated that equine waste disposal was not an issue raised by their trainers, and therefore it was not perceived that there was an under-provision in equine waste management routes / facilities in order that this would negatively impact on the racehorse industry. It is generally the case that many yards do not have the capacity to store equine waste on site. As such the waste is currently regularly collected by local farmers or taken directly by the trainers to the composting facility.
- The JC confirmed that nationally the number of racehorses in training have been falling for a number of years, although last year the foal crop grew, as did the numbers of racehorses in training.
- The JC confirmed that any new facility proposal to manage equine waste was more likely to be driven by technological advancements than by any increases in horse population locally within West Berkshire. Due to the current capacity in local racing yards being (in the main) fully occupied within Lambourn, no significant increases could happen without further planning permissions. It was estimated however, on current market trends, that yard capacities in Lambourn may look to increase in the future by approximately 400 horses. It is unknown when this would be however.
- The JC confirmed that it would be appropriate for new local plan policies to support any forthcoming proposals for a local facility which would manage equine waste from Lambourn, although this would be driven by whether there would be an adequate feed source and if appropriate technologies became available.
- Use of a specific policy for equine waste may not be necessary, if other policies were sufficiently flexible in the emerging MWLP to accommodate changes in equine waste management technology or circumstances.

Projected arisings

11.2.2 The projections for future arisings of equine waste use the baseline of 52,807 tonnes per annum established in section 11.1.20 above. These projections have been derived by multiplying the number of horses by the estimated annual manure generation rate for the average horse of 7.5 tonnes[138]. It should be noted however, that this quantity does not include the addition of soiled stable bedding material. It has been assumed that such arisings have been, and will continue to be, managed as part of existing waste streams (most likely commercial and industrial waste). The Jockey Club indicated during the Duty to Cooperate meeting that the estimated quantity of waste produced per horse (7.5 tonnes) over 12 months is a realistic figure.

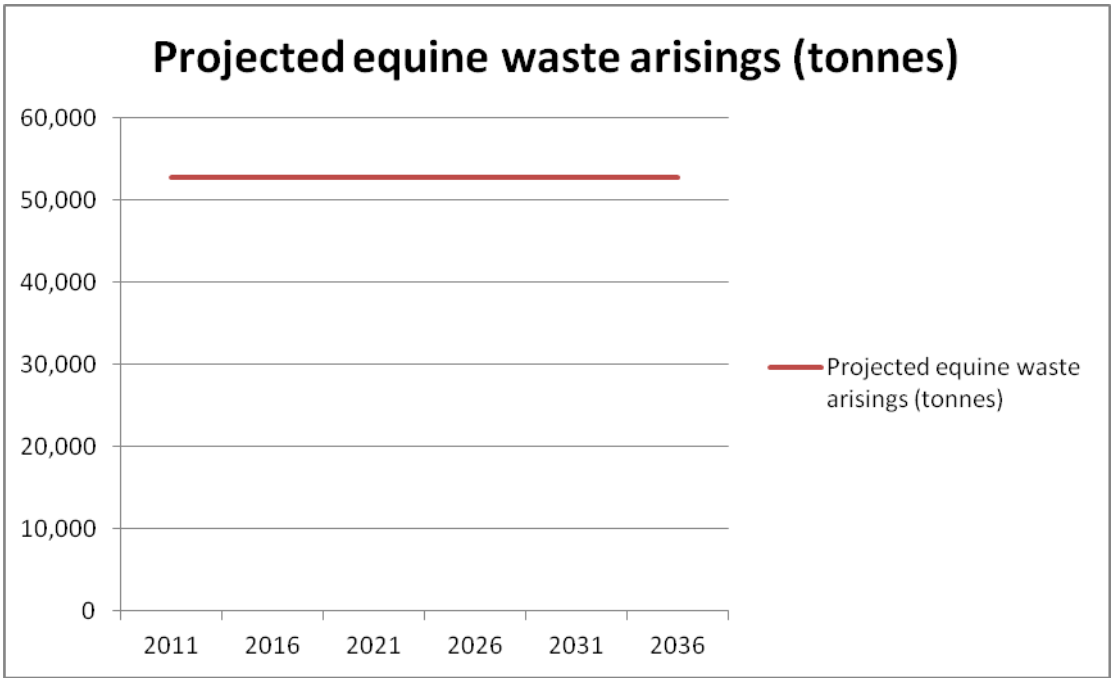
11.2.3 From an industry perspective there do not appear to be concerns about management routes/facilities for equine waste, indicating that there is likely to be adequate capacity in this regard. Although the JC has indicated that planning permission may be sought for an increase in yard capacities of approximately 400 horses in the near future, it is unknown when this would be, and in the context of the current estimated amount of horses in West Berkshire (i.e. between 5,351 and 7,041), this would not result in a large increase in waste arisings.

11.2.4 There appears to be no justification for assuming that the amount of equine waste is going to rise or fall in West Berkshire over the plan period and therefore it has been presumed that it remains constant over the period to 2036. Graph 11.2.1 plots these projections.

11.2.5 There appears to be industry support for a policy approach where a local equine waste management facility could be adequately assessed considering that flexibility would be required in terms of technology and circumstances related to the equine industry, and this fits with the approach that has been taken in the Preferred Options for the MWLP.

Graph 11.2.1

[138] Cotswolds Conservation Board Equine Guidance Note Waste Management, 2011 http://www.cotswoldsaonb.org.uk/userfiles/file/meetings%202011/c-and-m-meetings/c-and-m-16.6.11/agenda-item-12-appendix-a-ii-cotswolds-waste-management.pdf


Projected equine waste arisings (tonnes)
60,000
50,000
40,000
30,000
20,000
10,000
0
2011
2016
2021
2026
2031
2036
Projected equine waste arisings (tonnes)

12.0 Movement of Waste

Imports and exports from West Berkshire

12.1 It is widely acknowledged that waste moves across administrative boundaries, as like any business it is market driven, and private contracts will exist between parties which will influence where waste is transported to. In the case of waste planning authorities, not all types of waste facility will necessarily exist in the authority area which will mean that waste travels into and out of those authority areas.

12.2 The EA's Waste Data Interrogator (WDI) captures waste movements but relies on annual waste operator returns being provided to the EA. The 'waste received' data is acknowledged as being more reliable than the 'waste removed' and therefore the 'waste received' has been extracted for the years 2013 to 2015 to gain an understanding in indicative terms of patterns of waste movements into an out of West Berkshire.

12.3 Tables 12.1, 12.2 and 12.3 show the figures that have been derived from the WDI. As has already been discussed, there are known issues of reliability with the data from the WDI and therefore the tonnages are considered likely to be conservative. However, at this point, the WDI is considered to be the most reliable available data source for cross-boundary movements of waste. Each table comprises two parts based on arisings in West Berkshire, and waste managed in West Berkshire.

12.4 The tables are effectively divided into two sections which show waste recorded as arising in West Berkshire and waste that is recorded as being managed in West Berkshire. In terms of the waste arisings, each of the management routes are set out, as well as the 10 waste planning authorities to which the largest proportions of waste are transported from West Berkshire[139]. Similarly in the waste managed section, each of the management routes are considered, as well as the 10 waste planning authorities from which the highest quantities of waste are transported to West Berkshire.

12.5 Data derived from WDI 2013, 2014, and 2015 indicates:

- For each year there has been significantly more waste managed in West Berkshire than is recorded as arising there, the differences being 656,564 tonnes in 2013, 364,349 tonnes in 2014, and 329,104 tonnes in 2015.
- In terms of waste exported from West Berkshire during 2013, 2014 and 2015, in descending order, Oxfordshire and Hampshire received the largest tonnages consistently each year.
- In terms of waste managed in West Berkshire, the overall quantity managed dropped reasonably significantly between 2013 and 2014. This was largely due to a decrease in waste 'landfilled' and being deposited 'on/in land'. Overall levels of waste managed in West Berkshire were fairly similar in 2014 and 2015 at 712,593 tonnes and 698,268 tonnes respectively.
- Quantities of waste arisings from West Berkshire have remained relatively consistent over the three years at 361,053 tonnes, 348,245 tonnes, and 369,165 tonnes in chronological order.
- Reading has consistently accounted for the highest proportion of waste managed in West Berkshire, with Bracknell and Hampshire being in the top four in terms of imports. 'Berkshire' is also recorded as being in the top 4, however the waste origin could be any of the 6 waste planning authorities in Berkshire (including West Berkshire).
- In the past three years where data is available, the management routes utilised for the largest proportions of West Berkshire's arisings were 'treatment' or 'landfill', while for waste managed in West Berkshire, each year 'landfill' would have been the most used management method, although reasonable quantitries were also managed through 'treatment' and 'on/in land'.

[139] These authorities include 'not codeable' and 'Berkshire' values where they are in the top 10 in terms of tonnage, as well as the top 10 named waste planning authorities

12.6 It should be noted however, that when the data for *'2015 West Berkshire arisings managed through incineration'* is factored in (as shown in table 12.4), Hampshire would receive the largest quantity of waste (47,146 tonnes) in 2015, with Slough then in third place in receipt of 24,509 tonnes from West Berkshire. Overall, 37,493 tonnes of waste that arose in 2015 in West Berkshire was managed through incineration. Therefore it is likely that this would increase the overall tonnage of West Berkshire's arisings by this approximate quantity. Although only the 2015 incineration data has been looked at, if this figure is reasonably consistent in annual terms, it is potentially the case that Hampshire receives the largest quantity of waste from West Berkshire every year, potentially with Slough also being in the top 3 for exports annually. West Berkshire has no incinerator facilities so these data sets would not affect waste imports.

12.7 As waste planning authorities that receive the larger proportions of waste arisings from West Berkshire, West Berkshire Council has engaged with Hampshire, Oxfordshire and Slough through the Duty to Cooperate. This has taken a variety of forms including meetings and written correspondence. Through these discussions it should be possible to identify where there may be concerns about the export of waste to these authorities, and whether these movements can continue.

Table 12.1

2013						
Exports				**Imports**		
Arising in West Berkshire (excluding transfer)				**Managed in West Berkshire (excluding transfer)**		
Total	**361052.8**			**Total**	**1017616.5**	
Received at:		**% of total**		**Received at:**		**% of total**
Landfill	130877.4	36.2		Landfill	498303.4	49.0
MRS	29881.3	8.3		MRS	38647.9	3.8
On/In Land	65783.2	18.2		On/In Land	265709.2	26.1
Treatment	134510.9	37.3		Treatment	214955.9	21.1
Which are managed				**From**		
Within West Berks	266774.8	73.9		Within West Berks	266774.8	26.2
Other WPAs (top 10 + uncodeable and Berkshire if in top 10)				**Other WPAs (top 10 + uncodeable and Berkshire if in top 10)**		
Oxfordshire WPA	21088.0	5.8		Reading UA	364247.5	35.8
Hampshire WPA	16991.5	4.7		Bracknell Forest UA	86396.4	8.5
Bristol City WPA	12233.6	3.4		Berkshire	62164.5	6.1
Wiltshire WPA	9324.0	2.6		Hampshire	48112.0	4.7
Surrey WPA	8084.0	2.2		Windsor & Maidenhead UA	40337.5	4.0
Gloucestershire WPA	6185.7	1.7		Slough UA	34981.5	3.4
Wokingham WPA	5948.0	1.6		Wokingham UA	30250.1	3.0
Swindon WPA	4529.3	1.3		Oxfordshire	27027.7	2.7
Buckinghamshire WPA	3122.7	0.9		Surrey	10167.8	1.0
Reading WPA	1332.7	0.4		WPA Not Codeable (South East)	9085.9	0.9
				WPA not codeable (London)	7315.7	0.7
				Greenwich	7274.8	0.7
				Buckinghamshire	5021.3	0.5
Difference between arising and managed for 2013:				656563.7		

Table 12.2

2014						
Exports				**Imports**		
Arising in West Berkshire (excluding transfer)				**Managed in West Berkshire (excluding transfer)**		
Total	**348244.7**			**Total**	**712593.3**	
Received at:		**% of total**		**Received at:**		**% of total**
Landfill	168568.8	48.4		Landfill	320860.1	45.0
MRS	34797.8	10.0		MRS	32315.4	4.5
On/In Land	2330.8	0.7		On/In Land	102252.2	14.3
Treatment	142547.2	40.9		Treatment	257165.6	36.1
Which are managed				**From**		
Within West Berks	213095.9	61.2		Within West Berks	213095.9	29.9
Other WPAs (top 10 + uncodeable and Berkshire if in top 10)				**Other WPAs (top 10 + uncodeable and Berkshire if in top 10)**		
Oxfordshire WPA	55862.4	16.0		Reading UA	212503.4	29.8
Hampshire WPA	21897.7	6.3		Berkshire	60872.0	8.5
Bristol City WPA	16676.3	4.8		Hampshire	55777.8	7.8
Wiltshire WPA	12514.1	3.6		Bracknell Forest UA	32906.1	4.6
Swindon WPA	6527.8	1.9		Wokingham UA	30475.8	4.3
Wokingham WPA	4914.4	1.4		Oxfordshire	24393.8	3.4
Buckinghamshire WPA	4801.8	1.4		Slough UA	20030.8	2.8
Gloucestershire WPA	4643.3	1.3		Windsor & Maidenhead UA	19652.9	2.8
Surrey WPA	2715.6	0.8		WPA Not Codeable (South East)	9658.5	1.4
Derbyshire WPA	1112.6	0.3		Surrey	6364.7	0.9
				Buckinghamshire	5349.7	0.8
				Wiltshire	3989.5	0.6
Difference between arising and managed for 2014:				364348.6		

Table 12.3

2015						
Exports				**Imports**		
Arising in West Berkshire (excluding transfer)				**Managed in West Berkshire (excluding transfer)**		
Total	**369164.7**			**Total**	**698268.4**	
Received at:				**Received at:**		
Landfill	110173.0	29.8		Landfill	338527.2	48.5
MRS	18069.6	4.9		MRS	29144.4	4.2
On/In Land	111071.5	30.1		On/In Land	121418.9	17.4
Treatment	129850.5	35.2		Treatment	209177.8	30.0
Use of Waste	239.6	0.1				
Which are managed				**From**		
Within West Berks	249486.9	67.6		Within West Berks	249486.9	35.7
Other WPAs (top 10 + uncodeable and Berkshire if in top 10)				**Other WPAs (top 10 + uncodeable and Berkshire if in top 10)**		
Oxfordshire WPA	37191.7	10.1		Reading UA	151119.4	21.6
Hampshire WPA	23081.5	6.3		Berkshire	84856.0	12.2
Wiltshire WPA	15242.9	4.1		Hampshire	48419.3	6.9
Slough WPA	11183.6	3.0		Bracknell Forest UA	42447.6	6.1
Bristol City WPA	9548.6	2.6		Wokingham UA	29787.6	4.3
Buckinghamshire WPA	3545.4	1.0		Oxfordshire	26856.4	3.8
Surrey WPA	3489.0	0.9		Slough UA	14424.9	2.1
Wokingham WPA	2917.0	0.8		Windsor & Maidenhead UA	11593.7	1.7
Warwickshire WPA	2839.3	0.8		WPA Not Codeable (South East)	8514.9	1.2
Gloucestershire WPA	2392.1	0.6		Surrey	5834.1	0.8
				Wiltshire	4367.9	0.6
				WPA not codeable (South West)	4167.0	0.6
				WPA not codeable (London)	4104.0	0.6
				Swindon UA	2628.8	0.4
Difference between arising and managed for 2015:				329103.7		

Table 12.4 – West Berkshire waste arisings incinerated for 2015: by receiving waste planning authority

Receiving waste planning authority	Tonnage managed in 2015
Hampshire	24064.48
Slough	13325.32
Hillingdon	12.484
Bristol	18.942
Buckinghamshire	71.7
Total	**37492.93**

13.0 Conclusions

Table 13.1 Summary of arisings in base year and projected arisings at the end of the plan period

Waste Stream	Year of baseline arisings	Tonnage of current/baseline arisings per annum unless otherwise stated	Year of projected arisings (end of plan period)	Tonnage of projected arisings per annum unless otherwise stated
Local Authority Collected Waste (LACW)[140]	2015/16	86,399	2036/37	130,000[141]
Commercial and Industrial waste (C&I)	2016	285,696	2036	325,000
Construction, Demolition and Excavation waste (C,D&E)	2015	360,114	2036	360,114
Hazardous waste[142]	2015	15,392	2036	19,000
Radioactive waste[143]	2012/13	1,053 m^3	2036	309m^3
Sewage Sludge	*2011*	*3,809*	*2036*	*3,809*
Equine waste	2010	52,807	2036	52,807
Total[144]		**751,410**		**837,923**
		1,053 m^3		309m^3

13.1 Table 13.1 above draws on the assessment undertaken for individual waste streams earlier in this LWA, showing for each waste stream the current / baseline arisings per annum, and the projected arisings in 2036. The total arisings currently are estimated to be 751,410 tonnes per annum and by 2036 arisings are predicted to be a maximum of 837,923 tonnes. As discussed within the LWA the authority has generally sought to adopt the worst case projections, that remain realistic, that have been identified for each of the waste streams. As such it is considered that the projected arisings for 2036 are robust and may indeed overestimate the actual level of arisings at this date.

13.2 Graph 13.1 below shows that this increase predicted by 2036 is largely due to a potential increase in LACW and C & I waste. As described above, it is considered likely however, going on recent trends, that the actual LACW arisings by 2036 are likely to be lower than the forecasted figure that has been used. Also, it is likely that there is an element of double

[140] Local authority collected waste (LACW) represents all waste collected by the local authority. This is a slightly broader concept than Local Authority Collected Municipal Waste (LACMW) as it would include both this and non municipal fractions such as construction and demolition waste

[141] Considered to be absolute worst case scenario and going on trend data more likely to be 80,000 to 90,000 tonnes annually

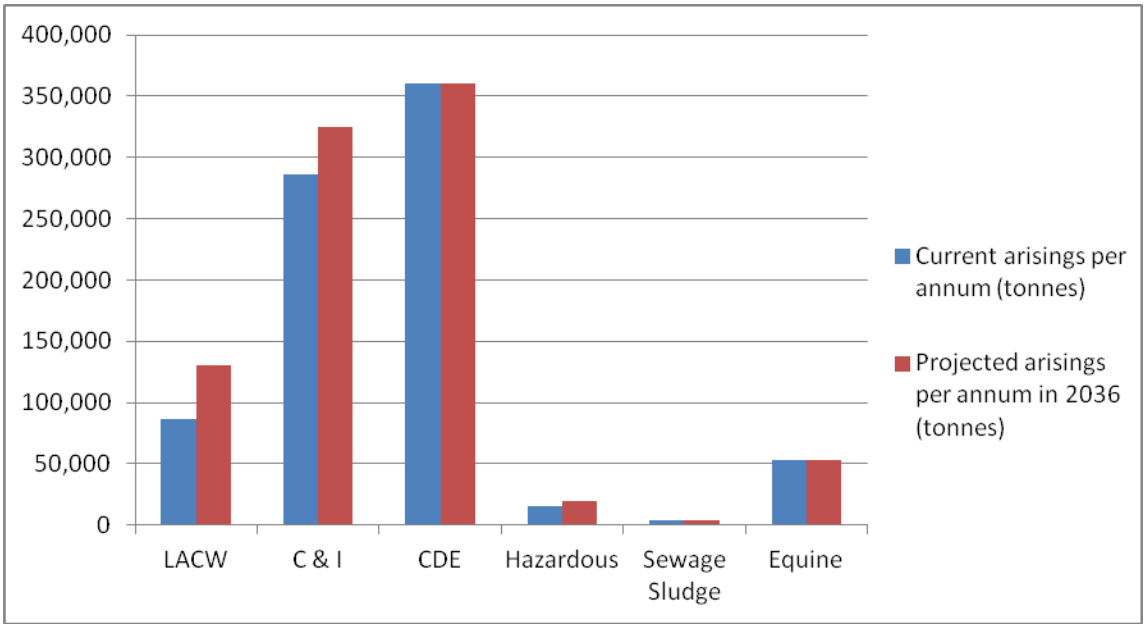
[142] It is acknowledged that there is a high risk of double counting of the hazardous waste stream as in theory it should be picked up by the Commercial and Industrial waste modelling, however it has been included as a worst case scenario

[143] 2012 Quinquennial Review: Submission supporting the AWE Decommissioning Strategy, Atomic Weapons Establishment, December 2012 and the underpinning data
Please note that it is difficult to trace the consigned volume to the disposal volume. For example, AWE may consign an ISO freight container containing up to 72 drums of LLW to the LLW compactor operated on behalf of LLWR where the volume is reduced by a factor of 5. The compacted drums are then loaded into a disposal container [typically a half height ISO container] and grouted before placing in the LLWR vault. So for this reason the quantities stated should be treated with caution

[144] Totals do not include radioactive wastes or equine wastes

counting by adding the hazardous waste separately into the total as in theory the hazardous waste stream would have been accounted for in the C & I waste stream, and to a lesser degree the LACW stream. Overall therefore, the projected arisings for 2036 are considered to be generous in terms of the quantity, and it is likely that there would be a lesser requirement over the plan-period.

Graph 13.1 – Current arisings per annum compared to projected arisings at end of plan-period (2036)



13.3 Table 13.2 below shows the current capacity of waste sites in West Berkshire broken down into 'facility type' and the total annual capacity excluding 'transfer' is **958,628** tonnes. When compared to the worst case projected total annual waste arisings for 2036 of **837,923** tonnes, it can be seen that there is a difference, and hence headroom of **120,705** tonnes. It should be acknowledged that two of the sites providing CDE recycling capacity operate under temporary consents and together these two sites provide approximately 110,000 tonnes of waste managemet capacity. Therefore, when this is factored in, there is still headroom of **10,705** tonnes.

Table 13.2

Facility type	Capacity in 2015 (tonnes)
Household Waste Recycling Centres	30,000
Biological treatment : thermal facilities, composting facilities, and sewage treatment	143,700
Recycling and Transfer facilities	914,180 (of which approximately 169,250 tonnes is transfer)
Specialist Treatment Sites	>39,998
Total	1,127,878
Total (excluding transfer)	958,628

13.4 In terms of new sites for the management of waste, it is only intended to allocate sites for inert landfilling where this is necessary for the restoration of sites which are being allocated for mineral extraction. Therefore, at this point no new waste facilities are being proposed for allocation in the emerging plan. This is largely due to the lack of new waste management sites that were put forward by prospective operators during teh call for sites excercise

undertaken by the Council. Only 2 'new' waste sites were put forward for inclusion in the MWLP; one of these was withdarwn and one was not considered suitable for allocation.

13.5 It is likely that CDE waste recycling facilities could be proposed in conjunction with some of the applications for mineral extraction at the allocated mineral sites throughout the plan-period. It is common practice for recoverable material to be taken from the CDE waste and sold for aggregate while the residual material (normally clays/silts) would be deposited in the mineral void. Therefore, these facilities could potentially replace the capacity that would be lost when the two temporary CDE recycling facilities close.

13.6 In 2015, total consented capacity for inert landfill was 354,000m3, and there will be another 1,250,000m3 capacity created when the Lower Farm site is extracted as consent has been granted for the extraction of sharp sand and gravel in this site. It is anticipated that the preferred minerals sites could require an additional 1,960,000m3 of landfill capacity to ensure the restoration of these sites over the life of the plan.

13.7 It has already been stated in the LWA that there is no non-inert / non-hazardous (or hazardous) landfill in West Berkshire (i.e. the only landfill available is inert). Similarly there is effectively no energy recovery capacity in the district. Therefore currently, due to the nature of the wastes, this would make it virtually impossible for all of the indigenous LACW and C & I waste arisings to be managed in West Berkshire, or even to achieve net self sufficiency on an individual waste stream basis.

13.8 No non-inert / non-hazardous landfill, or energy recovery sites are intended to be allocated in the emerging plan, due in the main to no sites of this nature being currently proposed by developers. Non-hazardous / non-inert landfill is unlikely to be economically viable in the district due to the relatively shallow deposits of mineral resources, the extraction of which are likely to precede landfilling. Therefore, throughout the plan-period, unless consent was to be granted for energy recovery facilities, self sufficiency or net self-sufficiency by individual waste stream is likely to be impossible for the authority to achieve. However, as has been shown above, taking what is considered to be an absolute worst case scenario, overall there is headroom of approximately 10,705 tonnes at 2036, the end of the plan-period. This means that net self-sufficiency can be achieved in total tonnage terms when factoring all waste streams into the equation. It is acknowledged that waste travels across administrative boundaries, hence the term 'net self sufficiency', and it is considered that this approach is in the spirit of Article 16 of the Waste Framework Directive[145]: *Principles of Proximity and Self-Sufficiency.*

13.9 In terms of waste movements, during 2013, 2014, and 2015 according to EA WDI, there has been significantly more waste managed in West Berkshire than was recorded as arising there, the differences being 656,564 tonnes in 2013, 364,349 tonnes in 2014, and 329,104 tonnes in 2015 respectively. The weaknesses in WDI are acknowledged, however this is certainly indicative of the fact that facilities in West Berkshire manage waste for a wider area than just West Berkshire itself.

13.10 No sites have been put forward by developers for inclusion in the emerging MWLP specifically for the management of radioactive waste. It is acknowledged that HLW and ILW require specialist management, and therefore at this point in time and throughout the plan period, it is unlikely that West Berkshire would host waste management sites that would undertake the final management of these streams. Subject to all planning and environmental considerations, there could potentially be VLLW managed through incineration or landfill (although this is considered less likely) throughout the plan-period. It is also possible that facilities may be required to aid in the transfer or stabilisation of waste prior to final management at another location.

[145] http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32008L0098

Appendix i: Recycling and composting (aspirational targets) for West Berkshire

	Recycling and composting (aspirational targets)
2012/13	46%
2013/14	50%
2014/15	53%
2015/16	54%
2016/17 to 2031/32	56%

Appendix ii: Local Authority Collected Waste Arising in West Berkshire

	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16
Local authority collected waste managed									**83,121**	**80,639**	**81,235**	**81,513**	**80,106**	**84,094**	**84,622**	**86,399**
Local authority collected municipal waste managed	**79432**	**81413**	**82117**	**78529**	**84599**	**84442**	**88453**	**83,986**	**81,525**	**78,269**	**78,435**	**78,156**	**77,011**	**80,776**	**80,856**	**82,346**
Local authority collected municipal waste recycled, reused & composted	**8990**	**9263**	**10239**	**13308**	**14706**	**16240**	**18914**	**20,301**	**27,719**	**31,464**	**32,927**	**36,108**	**38548**	**39817**	**41,933**	**42,667**
Local authority collected municipal waste composted	*892*	*1044*	*1489*	*3351*	*4232*	*4356*	*5217*	**5,110**	**9,783**	**13,509**	**14,048**	**17,155**	**18483**	**19386**	**20,545**	**19,942**
Local authority collected municipal waste recycled & reused	*8098*	*8219*	*8750*	*9957*	*10474*	*11884*	*13697*	**15,191**	**17,936**	**17,955**	**18,879**	**18,953**	**20023**	**20194**	**22,952**	**23,104**
Local Authority Collected municipal waste recovered	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**72**	**0**	**9,353**	**10,565**	**24,947**	**23873**	**25041**	**25,163**	**24,910**
Local authority collected municipal waste landfilled	**70442**	**72150**	**71878**	**65221**	**69893**	**68202**	**69539**	**63,613**	**53,807**	**37,452**	**34,943**	**17,101**	**13092**	**14136**	**12,196**	**13,590**

Appendix iii: Integrated Waste Management Final Business case scenarios

		2000/01	2001/02	2002/3	2003/4	2004/5	2005/6	2006/7	2007/8	2008/9	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15
Scenario 1	Growth	0.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
	Household tonnage	75,695	77,209	78,753	80,328	81,935	83,573	85,245	86,950	88,689	90,463	92,272	94,117	96,000	97,920	99,878
		2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	
	Growth	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	
	Household tonnage	101,876	103,913	105,991	108,111	110,273	112,479	114,728	117,023	119,363	121,751	124,186	126,669	129,203	131,787	
Scenarios 2		2000/01	2001/02	2002/3	2003/4	2004/5	2005/6	2006/7	2007/8	2008/9	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15
	Growth	0.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	1.50%	1.50%	1.50%	1.00%	1.00%	1.00%	1.00%	0.50%
	Household tonnage	75,695	77,209	78,753	80,328	81,935	83,573	85,245	86,524	87,821	89,139	90,030	90,930	91,840	92,758	93,222
		2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	
	Growth	0.50%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
	Household tonnage	93,688	93,688	93,688	93,688	93,688	93,688	93,688	93,688	93,688	93,688	93,688	93,688	93,688	93,688	
Scenario 3		2000/01	2001/02	2002/3	2003/4	2004/5	2005/6	2006/7	2007/8	2008/9	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15
	Growth	0.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	1.50%	1.50%	1.50%	1.00%	1.00%	1.00%	1.00%	0.50%
	Household tonnage	75,695	77,209	78,753	80,328	81,935	83,573	85,245	86,524	87,821	89,139	90,030	90,930	91,840	92,758	93,222
		2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	
	Growth	0.50%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
	Household tonnage	93,688	93,688	93,688	93,688	93,688	93,688	93,688	93,688	93,688	93,688	93,688	93,688	93,688	93,688	
Scenario 4		2000/01	2001/02	2002/3	2003/4	2004/5	2005/6	2006/7	2007/8	2008/9	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15
	Growth	0.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	1.75%	1.75%	1.75%	1.50%	1.50%	1.50%	1.25%	1.25%
	Household tonnage	72,959	74,418	75,907	77,425	78,973	80,553	82,164	83,602	85,065	86,553	87,852	89,169	90,507	91,638	92,784
		2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	
	Growth	1.25%	1.00%	1.00%	1.00%	1.00%	0.75%	0.75%	0.75%	0.50%	0.50%	0.50%	0.25%	0.25%	0.00%	
	Household tonnage	93,943	94,883	95,832	96,790	97,758	98,491	99,230	99,974	100,474	100,976	101,481	101,735	101,989	101,989	

Scenario 5		2000/01	2001/02	2002/3	2003/4	2004/5	2005/6	2006/7	2007/8	2008/9	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15
	Growth	0.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	1.75%	1.75%	1.75%	1.75%	1.75%	1.50%	1.50%
	Household tonnage	75,695	77,209	78,753	80,328	81,935	83,573	85,245	86,950	88,471	90,020	91,595	93,198	94,829	96,251	97,695
Scenario 5		**2015/16**	**2016/17**	**2017/18**	**2018/19**	**2019/20**	**2020/21**	**2021/22**	**2022/23**	**2023/24**	**2024/25**	**2025/26**	**2026/27**	**2027/28**	**2028/29**	
	Growth	1.50%	1.50%	1.50%	1.25%	1.25%	1.25%	1.25%	1.00%	1.00%	1.00%	1.00%	0.75%	0.75%	0.75%	
	Household tonnage	99,160	100,648	102,158	103,435	104,728	106,037	107,362	108,436	109,520	110,615	111,721	112,559	113,403	114,254	

Appendix iv: Table 2.2 of Integrated Waste Management Final Business case

Year	Waste household collected waste (including EFF)	Waste Collected Trade Waste (non contract waste)	HWRC collected Household waste (including recycling banks)	Other MSW (street sweepings)	Other MSW (parks waste and non contract HWRC waste)	Total MSW Arising (including non contract waste)	% change (total MSW)
2007/08						85513	
2008/09	60,445	600	21,360	2,485	1,970	86,725	1.42
2009/10	61,302	600	21,570	2,520	1,970	87,962	1.42
2010/11	61,955	600	21,805	2,547	1,970	88,907	1.07
2011/12	62,620	600	22,043	2,574	1,970	89,867	1.08
2012/13	63,279	600	22,301	2,602	1,970	90,842	1.08
2013/14	63,719	600	22,480	2,621	1,970	91,501	0.72
2014/15	64,164	600	22,660	2,640	1,970	92,167	0.73
2015/16	64,616	600	22,841	2,659	1,970	92,839	0.73
2016/17	65,074	600	23,023	2,678	1,970	93,519	0.73
2017/18	65,298	600	23,121	2,688	1,970	93,862	0.37
2018/19	65,528	600	23,220	2,698	1,970	94,207	0.37
2019/20	65,517	600	23,231	2,698	1,970	94,207	0.00
2020/21	65,507	600	23,242	2,698	1,970	94,207	0.00
2021/22	65,497	600	23,252	2,698	1,970	94,207	0.00
2022/23	65,487	600	23,261	2,698	1,970	94,207	0.00
2023/24	65,478	600	23,270	2,698	1,970	94,207	0.00
2024/25	65,469	600	23,279	2,698	1,970	94,207	0.00
2025/26	65,461	600	23,287	2,698	1,970	94,207	0.00
2026/27	65,453	600	23,295	2,698	1,970	94,207	0.00
2027/28	65,446	600	23,302	2,698	1,970	94,207	0.00
2028/29	65,439	600	23,309	2,698	1,970	94,207	0.00
2029/30	65,432	600	23,316	2,698	1,970	94,207	0.00
2030/31	65,426	600	23,322	2,698	1,970	94,207	0.00
2031/32	65,420	600	23,328	2,698	1,970	94,207	0.00

Appendix v: Projected future arisings of commercial and industrial waste

Year	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Estimated C & I waste arisings (tonnes)	285,696														
High growth : DEFRA	285,696	286552.9357	287412.5946	288274.8323	289139.6568	290007.0758	290877.097	291749.7283	292624.9775	293502.8524	294383.361	295266.511	296152.3106	297040.7675	297931.8899
%	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Central growth : DEFRA	285,696	284838.7607	283984.2444	283132.2916	282282.8948	281436.0461	280591.7379	279749.9627	278910.7128	278073.9807	277239.7588	276408.039	275578.8154	274752.0789	273927.8227
%	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Low growth	285,696	283410.2814	281142.9992	278893.8552	276662.7043	274449.4027	272253.8075	270075.777	267915.1708	265771.8494	263645.6746	261536.509	259444.2172	257368.6634	255309.7141
%	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
CIWM - Ricardo AEA extrapolated for West Berkshire	285,696	285698.757	285701.8407	285705.2174	285708.6493	285712.0807	285715.5121	285718.9435	285722.375	285725.8065	285729.2381	285732.67	285736.1014	285739.533	285742.9648
%	0.000935901	0.00101814	0.001079376	0.001181886	0.001201201	0.001201	0.001201	0.001201	0.001201	0.001201	0.001201	0.001201	0.001201	0.001201	0.001201
South East England Partnership Board - 2010 update of regional model	285,696	287495.732	289306.9552	291129.589	292963.7054	294809.3767	296666.6758	298535.6759	300416.4506	302309.0743	304213.6214	306130.167	308058.7873	309999.5577	311952.5549
%	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63

Year	2031	2032	2033	2034	2035	2036
Estimated C & I waste arisings (tonnes)						
High growth : DEFRA	298825.6855	299722.16	300621.3	301523.2	302427.8	303335
%	0.3	0.3	0.3	0.3	0.3	0.3
Central growth : DEFRA	273106.0392	272286.72	271469.9	270655.5	269843.5	269034
%	0.3	0.3	0.3	0.3	0.3	0.3
Low growth	253267.2364	251241.1	249231.2	247237.3	245259.4	243297.3
%	0.8	0.8	0.8	0.8	0.8	0.8
CIWM - Ricardo AEA extrapolated for West Berkshire	285746.3965	285749.83	285753.3	285756.7	285760.1	285763.6
%	0.001201	0.001201	0.001201	0.001201	0.001201	0.001201
South East England Partnership Board - 2010 reg model	313917.856	315895.54	317885.7	319888.4	321903.7	323931.6
%	0.63	0.63	0.63	0.63	0.63	0.63

Appendix vi: Forecasting of Very Low Level and Low Level waste arisings in the south east and Berkshire

UK region	Total low level wastes	Total very low level wastes
North West	380,561	3,281,135
North East	18,976	0
West Midlands	110	0
East Midlands	1,117	0
South West	145,543	16,000
South East	107,857	125,849
Berkshire	9,096	1,026
East Midlands	100,198	4,756
Wales	127,645	10,991
Scotland	276,331	32,452
Other	13,931	73
Total	1,172,269	3,471,255

Please note that it is difficult to trace the consigned volume to the disposal volume. For example, the operator may consign an ISO freight container containing up to 72 drums of LLW to the LLW compactor operated on behalf of LLWR where the volume is reduced by a factor of 5. The compacted drums are then loaded into a disposal container [typically a half height ISO container] and grouted before placing in the LLWR vault. So for this reason the quantities stated should be treated with caution

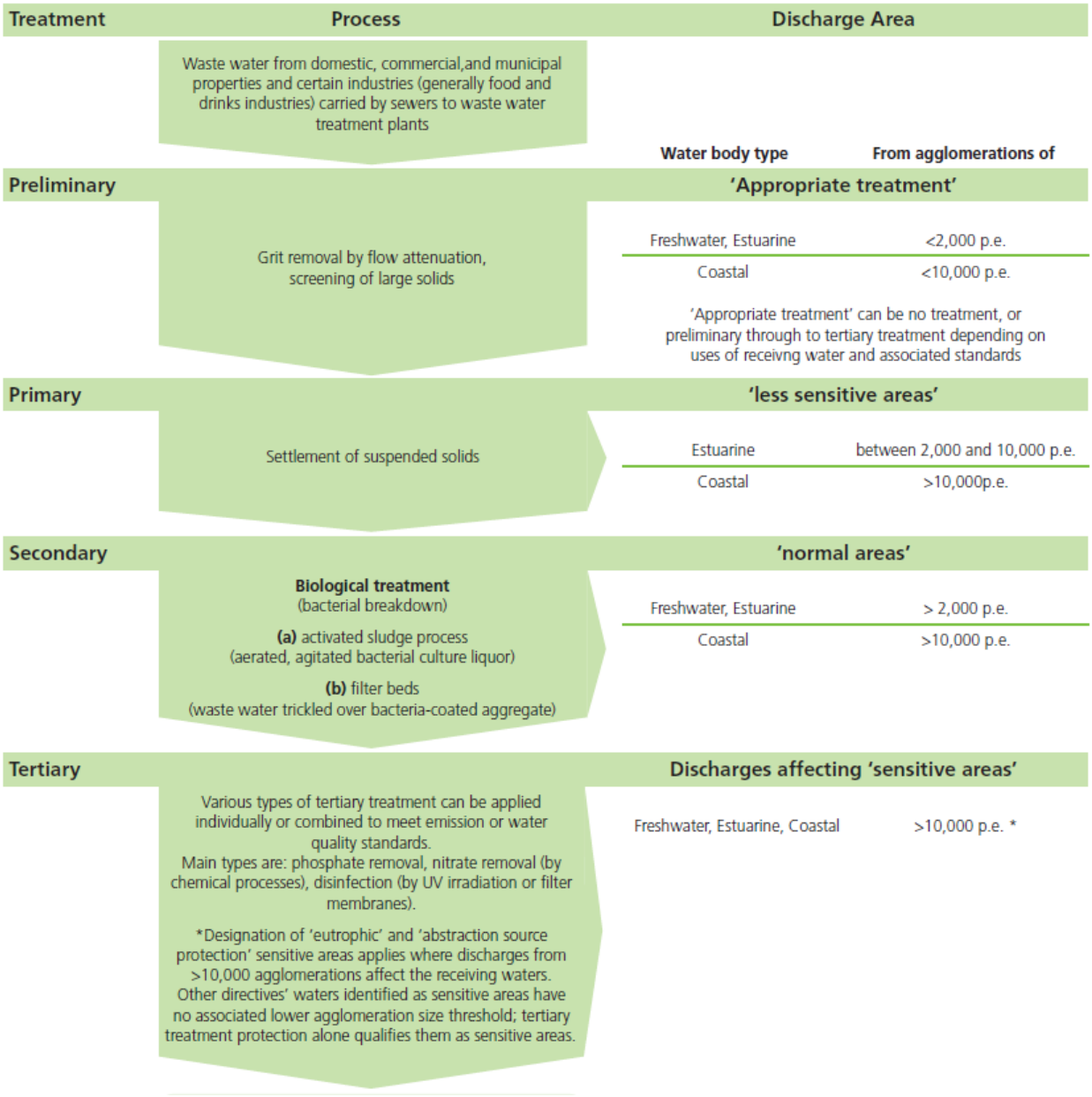
Appendix vii: Estimated figures for Radioactive waste in West Berkshire

Category	Radioactive Waste Quantities in m^3 - Financial Year ending March												
	FY 2012 to 2013	FY to 2014	FY to 2015	FY to 2016	FY to 2017	FY to 2018	FY to 2019	FY to 2020	FY to 2021	FY to 2022	FY to 2023	FY to 2024	FY to 2025
VLLW	108	264	139	173	65	64	81	52	52	50	50	70	70
LLW	825	296	287	213	74	78	105	137	137	132	132	140	135
ILW	120	120	120	111	110	75	75	118	105	105	105	104	104
HLW	AWE does not produce or store High Level Waste (HLW)												

2012 Quinquennial Review: Submission supporting the AWE Decommissioning Strategy, Atomic Weapons Establishment, December 2012 and the underpinning data

Please note that it is difficult to trace the consigned volume to the disposal volume. For example, AWE may consign an ISO freight container containing up to 72 drums of LLW to the LLW compactor operated on behalf of LLWR where the volume is reduced by a factor of 5. The compacted drums are then loaded into a disposal container [typically a half height ISO container] and grouted before placing in the LLWR vault. So for this reason the quantities stated should be treated with caution

Appendix viii: Sewage treatment stages



146

[146] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69592/pb13811-waste-water-2012.pdf

Appendix ix: Sewage treatment stages

Reuse or disposal route	Sludge discharged to surface waters by ships or pipelines	Sludge reused on agricultural land	Sludge reused for other purposes	Sludge disposed of at landfill/land reclamation	Sludge disposed of by incineration	Sludge disposed of by other methods	Total
1992	281,588	440,137	32,100	129,748	89,800	24,300	997,673
1996/97	323,379	524,097		100,359	89,208	133,812	1,115,100
1999/00		587,634		192,111	237,314	113,007	1,130,066
2008		1,241,639	90,845	10,882	185,890	1,523	1,530,779
2010		1,118,159	23,385	8,787	259,642	2,863	1,412,836

[147]

[147] 1992, 2008 and 2010 from https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69592/pb13811-waste-water-2012.pdf
1996/97 and 1999/00 from Sewage treatment in the UK, DEFRA, 2002 https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69582/pb6655-uk-sewage-treatment-020424.pdf

Appendix x: Estimated figures for Sewage Sludge in West Berkshire

	2001	2006	2011	2016	2021	2026	2031	2036
25 kg per person in kg	3,612,350	3,704,200	3,808,625	3,906,650	4,011,775	4,088,725	4,212,000	4,533,050
25 kg per person in tonnes	3,612	3,704	3,809	3,907	4,012	4,089	4,212	4,533
17.5 kg per person in kg	2,528,645	2,592,940	2,666,038	2,734,655	2,808,243	2,862,108	2,948,400	3,173,135
17.5 kg per person in tonnes	2,529	2,593	2,666	2,735	2,808	2,862	2,948	3,173
Initial 17.5kg per person plus a 30% growth rate	2,529	2,757	2,985	3,213	3,441	3,669	3,897	4125.076

Conversion 1,000 kg = 1 tonne

If you require this information in an alternative format or translation, please call 01635 42400 and ask for the Minerals and Waste Planning Policy Team.

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