

TAN21: WASTE

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TAN21

CONTENTS

The Planning Framework in Wales	1
Planning Principles	2
Strategic Planning for Waste	3
Development Management	4
Types of waste management facility	5
Annex A	EU Revised Waste Framework Directive Compliance Matrix
Annex B	Waste Planning Assessment
Annex C	Detailed Planning Considerations
Annex D	Glossary

Abbreviations

AD	Anaerobic Digestion
BOEO	Best Overall Environmental Option
BPEO	Best Practicable Environmental Option
C&D	Construction and Demolition
COx	Carbon Oxides
CAA	Civil Aviation Authority
CAS	Civic Amenity Sites
CHP	Combined Heat and Power
CIL	Community Infrastructure Levy
CIM Sector Plan	Collection, Infrastructure and Markets Sector Plan
CLO	Compost Like Output
EfW	Energy from Waste

TAN 21: WASTE (DRAFT)

EIA	Environmental Impact Assessment
ELV	End of life Vehicles
ES	Environmental Statement
EU	European Union
HGV	Heavy Goods Vehicle
IVC	In-vessel Composting
LCA	Life Cycle Assessment
LDP	Local Development Plan
MBT	Mechanical Biological Treatment
MHT	Mechanical Heat Treatment
MRF	Material Recovery Facility
MW	Mega Watts
N0x	Nitrogen Oxides
NRW	Natural Resources Wales
OWC	Open Windrow Composting
PCC	Pollution Prevention and Control Permit
PM10	Particulate Matter
rWFD	revised Waste Framework Directive
S0x	Sulphur Oxides
SWMP	Site Waste Management Plan
TAN	Technical Advice Note
TZW	Towards Zero Waste
VOC	Volatile Organic Compound
WCA	Waste Collection Authorities
WEEE	Waste Electrical and Electronic Equipment
WPA	Waste Planning Assessment

CHAPTER 1: THE PLANNING FRAMEWORK IN WALES

1.1 This TAN should be read in conjunction with:

- Planning Policy Wales (Edition 5, November 2012);
- '*Towards Zero Waste - One Wales: One Planet*'. The overarching waste strategy document for Wales (June 2010);
- Part 6 of The Waste (England & Wales) Regulations 2011
- Relevant 'Sector Plans', with particular reference to the 'Collections, Infrastructure and Markets (CIM) Sector Plan' (July 2012).

1.2 Planning Policy, Technical Advice Notes, Circulars and the overarching national waste strategy (including the waste sector plans) should be taken into account by Local Planning Authorities in Wales in the preparation of development plans. They may be material to decisions on individual planning applications and will be taken into account by Inspectors and the Welsh Government in the determination of appeals and called-in planning applications.

1.3 This guidance note provides advice on how the land use planning system should contribute towards sustainable waste management and resource efficiency, reflecting the new waste management drivers at an EU and Wales level. The Welsh Government's overarching waste strategy for Wales, '*Towards Zero Waste - One Wales: One Planet*' (TZW), sets out a long term framework for resource efficiency and waste management in Wales up until 2050, taking into account social, economic and environmental outcomes. Achieving the aims in TZW relies on a suite of waste sector plans. These provide details on how the outcomes, targets and policies in TZW are to be implemented.

1.4 Planning Policy Wales, this TAN, Local Development Plans, TZW, and the Sector Plans, taken as a whole, comprise the overall waste management plan for Wales as required under EU law, particularly Articles 1,4,13, 16, and 28 of the Waste Framework Directive (rWFD). This document sets out the relevant land use planning considerations necessary to ensure that the new EU waste management drivers are reflected in Wales when new waste management facilities are proposed.

1.5 Waste is an increasingly important issue in society and there are economic and social imperatives, as well as environmental ones for us all to use non-renewable resources more wisely through resource efficiency measures and the increased use of alternatives. In order to secure our resources and extend their use within the economy we need to prevent waste from arising and where this is not possible we need to be (i) capturing waste in ways that enable us to reclaim materials to be used again and (ii)

harnessing waste as a resource in its own right. The Welsh Government reconfirmed its commitment towards sustainable development in the Government of Wales Act 2006. This commitment will be consolidated in the Welsh Government's forthcoming Sustainable Development Bill. The Welsh Government is committed to addressing waste issues and making Wales a zero waste, high recycling society.

1.6 The definition of waste is established in Article 3(1) of the rWFD, which provides:

“Waste” means any substance or object which the holder discards or intends or is required to discard¹.

1.7 The Waste Planning Authority is the Local Authority and National Park Authority with responsibility for land use planning control over waste management. The Waste Collection and Disposal Authority is the Local Authority responsible for the safe collection and disposal of municipal wastes arising in a particular geographical area². National Park Authorities do not have responsibilities in relation to waste collection and disposal. National Park Authorities act as local planning authorities within the boundaries of their national park and as such are expected to collaborate in planning for waste facilities. The Waste Regulation Authority, having responsibility for the issue and control of Environmental Permits is Natural Resources Wales (NRW). However, where regulated facilities are found within Class B³ and have no interaction with water, the responsibilities will fall to the relevant local authority.

1.8 The Welsh Government and the rest of the United Kingdom are committed to the full and timely transposition and implementation of a number of Directives in the management of waste. The result of this commitment is a legal and policy framework that will shape the way that waste as a resource has to be planned for and managed.

Scope of this guidance

1.9 *TZW* and the suite of existing and emerging waste sector plans will deal with matters beyond the scope of this guidance in providing the framework within which Wales will reduce the amount of waste it produces, and make the transition to a high recycling society. This TAN is intended to facilitate a comprehensive, flexible, integrated and adequate land use planning framework for the delivery of sustainable waste management in Wales. Due to the pace of legal, environmental and technological change, Planning Authorities should engage and will benefit from engagement with others in local and central government, the waste management industry, the environmental regulator, the voluntary sector and the general public. This TAN refers to the relationship between Local Planning Authorities and the environmental regulator, and their responsibilities (and overlaps) in relation to the planning and permitting system respectively.

¹ Directive 2008/98/EC on waste, OJ [2008] L312/3.

² Environmental Protection Act 1990, s.30.

³ Environmental Permitting (England and Wales) Regulations 2010, s.8 & 32

Sustainable Waste Management

1.10 Sustainable development is a key functioning principle of the Welsh Government and its policies⁴. The movement towards sustainability in relation to planning for waste should be guided first by the waste management hierarchy and by the principles upon which any framework for waste management should be founded. The hierarchy and guiding principles are described in Chapter 2.

1.11 Land use planning has a vital role to play in facilitating sustainable waste management in Wales. It should:

- Drive the management of waste up the waste hierarchy through the provision of an adequate network of appropriate facilities;
- Minimise the impact of waste management on the environment (natural and man made) and human health through the appropriate location and type of facilities;
- Recognise and support the economic and social benefits that can be realised from the management of waste as a resource within Wales.

Planning Implications of Key European Directives

1.12 Further details of the key European Directives and Decisions on waste are included within the supplementary document, Waste Planning: Practice Guidance. The following summary sets out the requirements of the most relevant Directives and their implications for planning for waste.

The Waste Framework Directive⁵

1.13 The rWFD marks a shift in how we think about waste. Waste should be regarded as a valuable resource rather than as an unwanted burden. The Directive establishes clearer definitions, provides greater emphasis on the importance of preventing waste from arising (through the incorporation of reuse within prevention) and includes preparation for re-use. The Directive also sets more ambitious recycling goals. The new elements have implications for how and what we plan for in waste management infrastructure.

1.14 Article 16 is one of a number of Articles within the rWFD which TAN 21 implements through its land use planning policies. Article 16 requires Member States to establish an integrated and adequate network for the disposal of

⁴ Government of Wales Act 2006, s.79; Welsh Government (May 2009) One Wales: One Planet - The sustainable development scheme of the Welsh Assembly Government. Available online at: <http://www.sustainwales.com/library/one-wales-one-planet-sustainable-development-scheme-wales>; Welsh Government (July 2008) People, Places, Futures: The Wales Spatial Plan Update. Available online at: <http://wales.gov.uk/location/strategy/spatial/documents/wsp2008update/?lang=en>.

⁵ Directives 2008/98/EC on waste, OJ [2008] L312/3.

wastes, and for the recovery of mixed municipal and residual wastes. This network should include all necessary supporting waste management facilities such as waste transfer stations and processing facilities. The network should be adequate to deal, as far as practicable, with the range and volume of waste arisings. To help achieve this, Member States are required under Article 28 of the rWFD to produce waste management plans. Local planning authorities should adopt a partnership approach with waste colleagues when developing the waste policies of their local development plan. The local development plan should clearly identify that the policies satisfy the requirements of Article 28 of the rWFD. The provision of the network will depend upon the volume and type of waste generated in an area.

1.15 The planning system itself cannot deliver the network, this will be achieved by the private sector (aided in part by support from the Welsh Government where a need for market intervention exists) and through public procurement exercises for the procurement of capacity for the management of certain waste streams for the municipal waste sector. Local authorities should make best efforts to engage with procurement exercises in order to effectively fulfil the role of facilitating the establishment of the network through local development plans and the development control process.

The Landfill Directive⁶

1.16 Where the reuse, recycling or recovery of waste is not possible or will cause greater harm to human health and the environment, disposal of such waste remains the appropriate management option.

1.17 The Landfill Directive sets stringent requirements for the landfilling of wastes in Wales. The key requirements of the Directive are:

- the separation of wastes through a classification approach to landfills: landfill for hazardous waste; landfill for non-hazardous waste and landfill for inert waste⁷;
- the treatment of wastes prior to landfilling⁸;
- banning of certain wastes from being landfilled for example, liquid wastes, explosive and flammable wastes; clinical and veterinary wastes and whole or shredded waste tyres⁹;
- reduction in the amount of biodegradable municipal waste going to landfill¹⁰;
- landfill location requirements.

⁶ Directive 1999/31/EC on the landfill of waste, OJ [1999] L182/1.

⁷ Article 4, Landfill Directive.

⁸ Article 6, Landfill Directive. Treatment is defined under Article 2 as *the physical, thermal, chemical or biological processes, including sorting, that change the characteristics of the waste in order to reduce its volume or hazardous nature, facilitate its handling or enhance recovery.*

⁹ Article 5, Landfill Directive.

¹⁰ Article 5(1), Landfill Directive.

1.18 Local Planning Authorities should aim to support applicants in locating suitable sites (through pre-application and similar processes), where industries are producing recycled and secondary materials, and when such proposals genuinely aim to:

- divert waste away from landfill, can demonstrate they reflect the hierarchy of waste management options or which treat waste to enable its beneficial use in accordance with the hierarchy, and which provide a high level of protection for human health and the environment. This is discussed in Chapter 2.
- help Wales meet the biodegradable municipal waste targets of the Landfill Directive and the Waste and Emissions Trading Act 2003 (as amended).

1.19 Local planning authorities and waste management operators should be mindful of the fact that changes in the nature and acceptability of current landfill arrangements will necessitate changes in the treatment and disposal of waste. These changes may be brought about by revised restrictions, ban or increased targets from the European Union or they may be as a result of Welsh Government measures introduced to stimulate more rapid changes to the ways we manage our waste and move us towards zero waste to landfill. The Waste (Wales) Measure 2011 enables the Welsh Minister to make Regulations for Wales to restrict or ban certain wastes from landfill. This would have an effect on the volume and types of wastes needed to be dealt with in other types of waste management facilities.

1.20 Local authorities should be mindful of the need for facilities to accommodate waste streams prohibited and/ or restricted from landfill. Local authorities should seek to make provisions for facilities where a need has been demonstrated through the LDP process. (See Chapter 3 for more detail).

The Overarching Waste Strategy for Wales: Towards Zero Waste and relevant Sector Plans

1.21 *TZW* is the overarching waste strategy document for Wales. It sets out a long term framework for resource efficiency and waste management in Wales up until 2050, taking into account social, economic and environmental outcomes. Delivering on the objectives contained in *TZW* relies on a suite of waste sector plans. These sector plans provide the details on how the outcomes, targets and policies in *TZW* are to be implemented. Of particular importance for land use planning and waste is the '*Collections, Infrastructure and Markets (CIM) Sector Plan*'. The CIM Sector plan is of most relevance and focuses on delivering the necessary collection systems, infrastructure and markets for recyclates in Wales. The plan looks to create the conditions for proximity and self-sufficiency for the recovery and disposal of mixed municipal waste to enable the majority of residual waste to be managed in Wales and for as much as possible of the recyclate generated in Wales to be used in Wales. It will do this by ensuring that a high volume of recyclate is delivered to reprocessors and that end markets are developed in Wales for the recyclates and by aiming to maximise the value from residual waste to the benefit of

Wales. *TZW*, and the Sector Plans implement the requirements of the rWFD and outline the responsibility of Waste Planning Authorities for identifying suitable sites for waste treatment and disposal installations for the management of mixed municipal waste¹¹.

1.22 In order to reach the goal of zero waste, there is a difficult balance to be struck between making sure we have sufficient capacity to deal with our waste arisings in the short term (to avoid environmental impacts) in a way which does not impede the achievement of longer term goals post 2024/25. In order to achieve an increase in the quantity of waste material being diverted from landfill to preferred management methods, early delivery of residual waste treatment infrastructure is essential.

Waste Production and Forecasts in Wales

1.23 *TZW* and the CIM Sector Plan provides data on the amount of waste arising in Wales. The CIM Sector Plan breaks this data down by waste material and by source. It should be noted that not all waste arising in Wales is managed in Wales, some is "exported" usually to other UK counties for treatment, recycling, recovery or disposal. Waste is also imported into Wales for management at Welsh facilities. It is not necessary for Wales to have within its borders a full suite of facilities necessary to comply with the requirements of the rWFD, or to manage all of its own waste, covering the full range of possible waste management infrastructure.

1.24 Factors including the volume of a certain waste, its frequency of arising and location may mean that some waste is better managed across the border. Similarly, Wales does not only manage its own waste arisings, waste is taken from other parts of the UK and treated, recycled, recovered and disposed of in Wales.

1.25 Whilst all types of waste should be managed sustainably, the rWFD requires special attention to be paid to infrastructure for the management of mixed municipal waste. Along with mixed municipal waste, the rWFD establishes preparation for re-use and recycling targets for a number of priority materials including paper, metal, plastic and glass. CIM Sector Plan identifies a number of priority materials: paper, card, metal, glass, plastics, food, hazardous waste and Directive wastes¹².

1.26 As waste composition changes over time facilities will need to adapt. It should be noted that a number of waste management installations are capable of taking a range of waste materials. For more information on the technological aspects and associated specific planning considerations, see

¹¹ Municipal waste means waste collected by local authorities in accordance with the statutory duties set out under s.45 and 51 of the Environment Protection Act 1990. Article 16 of the rWFD requires an integrated and adequate network of installations to be established for the disposal and recovery of mixed municipal waste.

¹² Welsh Government (July 2012) *Collections, Infrastructure and Markets Sector Plan* at p .5, 16-17.

the separate guidance document entitled: Waste Planning: Practice Guidance.

CHAPTER 2: PLANNING PRINCIPLES

General Principles

2.1 When considering development proposals for all types of waste management facilities, planning authorities should take into account their potential contribution to the objectives, principles and strategic waste assessments set out in *TZW* and the relevant waste sector plans and the relevant development plan for the area. The extent to which a proposal demonstrates this contribution, in environmental, economic and social terms, will be a material planning consideration. The aim is to ensure that the right facilities are located in the right place to meet environmental, economic and social needs. At both a strategic and site level this means accepting that waste will need to be managed in all areas of Wales, that economic considerations relating to demand and viability may affect what management options can be acceptably brought forward in an area and that all proposals must be environmentally acceptable.

2.2 Planning authorities should take account of the planning considerations identified in Annex C in the determination of planning applications for waste management facilities. Where a proposal is environmentally unacceptable or would cause impacts on amenity and the problems cannot be mitigated to an acceptable standard by conditions, planning permission should be refused.

2.3 There are clear environmental, economic and social benefits associated with managing waste as a resource and optimising efficiency of use of waste material. The expanding waste management sector can offer job and training opportunities and safeguard existing jobs as a result of cost savings associated with increased resource efficiency. The creation of new infrastructure and jobs can support and regenerate local communities through skills enhancement and increased local expenditure.

2.4 The private, charitable and voluntary sectors all play a role in enabling re-use and preparation for re-use. These facilities often provide social and community benefits as well as environmental and economic benefits. They offer employment up-skilling opportunities in the green jobs sector and they often create training and employment opportunities for those socially excluded, including those with learning difficulties and other disadvantages. The social, economic and environmental benefits of this sector should be taken into account by planning authorities.

2.5 The rWFD and daughter directives set down obligations for all sectors of waste. Amongst targets for a variety of waste materials, specific requirements are established in relation to mixed municipal waste from households and similar waste from other sources. These requirements are reflected across the Welsh Government's waste management plans (*TZW*,

the suite of sector plans and within this technical advice note). This TAN provides advice on all types of waste management facilities, and sets out the specific requirements for waste disposal and mixed municipal waste treatment infrastructure.

2.6 The following principles will have already shaped the development of *TZW* and the relevant waste sector plans and will have been factored into the associated strategic waste assessments implicit within these documents. Therefore, whilst the Welsh Government policy context provides a starting point for progressing Local Development Plans and for determining planning applications, local approaches and decisions should demonstrate that the principles contained in this section have been taken into account.

The Waste Hierarchy (Article 4 rWFD)

2.7 The Waste Hierarchy is a central pillar to inform decisions on waste management options. The objective of the Waste Hierarchy is to ensure that wastes are managed in a way that delivers the best overall environmental outcome. The options for waste management appear in the waste hierarchy in general order of preference and sustainability. It should be noted that the waste hierarchy is not absolute, and does not mean that all waste should be reduced or recycled where it is not practical to do so, nor does it necessarily mean that there should be no further provision of landfill or energy from waste facilities.

2.8 The Welsh Government has produced guidance for waste producers on how to apply the waste hierarchy¹³. Whilst this guidance provides a useful indication of where waste treatment technologies sit within the waste hierarchy, the guidance is not written for the purposes of land use planning. When taking planning decisions it is expected that the waste hierarchy be applied as a priority order, unless, for specific waste streams departing from this hierarchy is justified by life cycle thinking on the overall impacts of the generation and management of such waste. This approach replaces the Best Practicable Environmental Option (BPEO) test as the means of assessing the appropriateness of potential developments.

¹³ Welsh Government (January 2012) Guidance on applying the waste hierarchy (Welsh Government: Cardiff) Available online at: <http://wales.gov.uk/docs/desh/publications/120119wastehierarchyguideen.pdf>

Diagram 2.1 – The Waste Hierarchy



2.8.1 Prevention

Waste prevention is key to the efficient use of natural resources. If we use fewer resources we have less waste to manage and treat and therefore there is less demand for waste management infrastructure. Preventing waste from arising in the first place relies on improved and more sustainable patterns of production and consumption. Land use planning is limited in the ways it can contribute to waste prevention. Measures which prevent waste from arising include reducing the quantity of waste produced through the reuse of products and the extension of the lifespan of products. Planning authorities could help raise awareness, either at the pre-application stage or through supplementary planning guidance, by encouraging developers to think about how they may reduce waste at both the construction and operational stages of development. This could mean taking into account the potential to use excavated waste material on site, for example in landscaping and noise bunds, and whilst not strictly a prevention measure, by encouraging the provision of space for facilities to manage waste sustainably as part of development schemes. Further advice on sustainable design can be found in TAN 12 Design.

In relation to construction and demolition (C&D) waste, the Welsh Government intends to introduce a requirement on developers to produce a Site Waste Management Plan (SWMP). Amongst other things, SWMPs would set out the ways in which the developer plans to prevent, manage and

dispose of waste, the description of the works to be carried out and the use of materials and resources¹⁴.

The re-use of waste products and materials is classified under the revised waste hierarchy as part of waste prevention. Re-use is where materials are used again for the same purpose for which they were made. This helps to divert products and components from becoming waste. Adequate facilities, sited appropriately, that encourage and support re-use should be considered favourably by planning authorities.

2.8.2 Preparation for re-use

Materials and products which need cleaning, checking and/or repairing before they are capable of safely performing their original function are waste until they have been prepared for re-use and all relevant pre-processing and recovery operations have been undertaken.

Reuse and preparation for reuse facilities and associated commercial schemes collect and repair discarded products, items and appliances such as furniture, electrical and electronic equipment, domestic white goods, vehicle parts and machinery. They tend to be small-scale, although not exclusively so. The preparation for reuse and sale for reuse of these items reduces demand on raw materials and the energy in producing new goods. These facilities should be supported in principle.

Reuse and preparation for reuse facilities may be be appropriately sited on high streets, as retail concerns, or on business land as high tech or storage and distributing operations. The preferred siting of these types of facilities will depend upon the nature and scale of their activities. Local authorities play an important part in providing reuse facilities and ensuring opportunities exist to separate waste which is able to be reused. In the future, this could mean greater provision of reuse facilities at existing civic amenity sites.

Proposals aimed at preparation for reuse and reuse facilities should be considered favourably, taking into account factors associated with the deposit and collection of goods, the nature of the repairs, maintenance and treatment, the need to ensure satisfactory transport and accessibility for the deposit and collection of goods and potential implications of dust, litter and noise from the dismantling, treatment and maintenance undertakings on the site, all of which will vary on a case-by-case basis.

As emphasis on reuse grows, planning authorities should expect proposals for retail developments specialising in or involved in reuse or preparation for re-use. Access for drop-off and collection, taking into account the nature and potential bulkiness of these goods as well as the need to maintain suitable shop frontages in prime shopping areas will influence the suitability of location for such proposals.

¹⁴ The Clean Neighbourhoods and Environment Act 2005, c.16.

2.8.3 Recycling

Where it is not possible to re-use materials and products or prepare them for re-use, recycling should be encouraged. Recycling can reduce the demand for resources and reduce atmospheric emissions.

Recycling is considered to be any recovery operation in which waste materials are reprocessed into products, materials or substances whether for their original or other purposes. Recycling includes the reprocessing of organic material through composting and anaerobic digestion. The meaning of recycling does not extend to energy recovery and the reprocessing of materials for use as fuels or for backfilling operations. Priority should be given to the development of new infrastructure that promotes high quality, closed loop recycling, or upcycling where feasible, with a focus on dealing with separately collected materials. Further advice on recycling infrastructure can be found in Chapter 5.

2.8.4 Recovery

Where wastes cannot be recycled, other waste recovery operations should be encouraged. Waste recovery operations result in waste that can serve a useful purpose by replacing primary fossil fuel materials (i.e. coal or gas) which would otherwise have been used to fulfil a particular function in the plant or in the wider economy. Energy recovery includes: incineration, incineration with energy recovery, co-incineration (e.g. cement kiln), anaerobic digestion¹⁵, pyrolysis and gasification with energy recovery and the spreading on land of a separated out bio-waste.

Recovery of energy from waste can offer an efficient method of waste management for mixed or residual wastes to divert residual waste from landfill. The Welsh Government views the recovery of energy from residual waste in high efficiency facilities as a vital component of the waste management system in Wales. Such facilities are considered to represent the best overall environmental outcome for the delivery of sustainable outcomes for residual waste.

Co-locating these facilities with heat users is preferential in order to allow utilisation of waste heat from the combustion process. When preparing proposals, developers should give consideration to the location of these

¹⁵ Anaerobic digestion may fall within the recycling category where certain standards and quality of biowaste are achieved.

facilities and the potential for future user demand and planning authorities should identify any opportunities for co-location in their Local Development Plans.

Waste incineration facilities dedicated to the processing of municipal solid wastes only may be considered to be recovery facilities rather than disposal facilities under certain specified conditions. The R1 Formula, defined in Annex II of the rWFD, allows a distinction to be made between disposal and recovery in respect of incineration based upon the energy efficiency of the facility. Under the R1 Formula, incineration facilities dedicated to the processing of municipal waste only must have energy efficiency above 0.60 for installations in operation and permitted before 1 January 2009 and 0.65 for installations permitted after 31 December 2008 to be categorised as recovery operations.

High efficiency energy from waste (EfW) facilities, as referred to in *'Towards Zero Waste'* and the CIM Sector Plan are encouraged. 'High Efficiency' facilities are defined as those facilities which exceed the R1 Formula limits. The Welsh Government aims for EfW facilities to be 'heat enabled' to allow the subsequent development of Combined Heat and Power (CHP) options. This then allows the development of facilities with thermal conversion efficiencies which approach, or even exceed, 60%. (By comparison, attaining an R1 value of 0.65 equates to a thermal efficiency of approximately 35%).

Where there is uncertainty as to whether or not a proposal constitutes a disposal or recovery operation, planning authorities should discuss the specific proposal with NRW before arriving at a judgement. Such discussion will be critical for ensuring consistency between the planning and permitting decisions.

2.8.5 Disposal

Where recovery cannot be undertaken waste must undergo safe disposal operations that ensure a high level of protection of human health and the environment. Disposal includes landfilling operations, and the incineration of waste without energy recovery or where energy is recovered at a low efficiency for plants recovering energy from municipal residual wastes (see 2.8.4 above.).

The Welsh Government aspires to achieve as close to zero landfill as possible. Maximum volumes of waste to landfill have been set under *TZW* and reconfirmed in the CIM Sector Plan. The recycling and reuse targets set by *TZW* and the CIM Sector Plan will, over time, result in a reduction in the volume of waste requiring disposal. As a result, landfill has an ever decreasing role to play in waste management. Nevertheless, it still has a role in the short to medium term whilst the necessary waste treatment infrastructure is coming on stream and in the management of certain types of wastes, where no better environmental outcome exists. Where no other alternatives exist (i.e. for legacy wastes such as asbestos) it will be necessary

to ensure that sufficient landfill void is maintained to dispose of as small an amount of inert residual wastes until such time as Wales completes the transition to a Zero Landfill society.

An Integrated and Adequate Network (Article 16 - rWFD)

2.9 In order to achieve sustainable waste management, an integrated and adequate network of installations for the recovery and disposal of mixed municipal waste and similar wastes from other producers must be established¹⁶. This principle applies to waste disposal and the recovery of mixed municipal waste and is implemented by reflecting the waste hierarchy, the proximity principle (enabling waste to be treated as close as possible to where it arises) and supporting the drive towards self-sufficiency as part of decision making. Whilst the waste hierarchy is relevant to all decisions concerning waste management proposals, proximity and self sufficiency are only applicable for the purposes of the rWFD to proposals for waste disposal or the recovery of mixed municipal waste.

Proximity

2.10 The Proximity Principle states that waste falling with Article 16, should be treated and or disposed of as near to the source of its origin as possible. This means taking into account environmental, economic and social factors, ensuring the right waste management facilities are located in the right place and at the right time. There are several reasons why it is important for us to manage such waste close to where it arises. This includes reducing the detrimental environmental impacts associated with the transportation of waste and retaining the intrinsic value of waste as a resource in line with the need to secure greater resource efficiency.

2.11 In particular, the integrated and adequate network of waste installations required for the recovery of mixed municipal waste and the disposal of waste should be designed to enable waste to be recovered or disposed of in one of the “nearest appropriate installations” whilst ensuring a high level of protection for the environment and human health. Planning authorities should not attempt to restrict waste management developments within their boundaries to deal only with arising in their areas. Clearly, the treatment and or disposal of mixed municipal waste arisings as near to the source as possible will depend upon the quantities and types of arisings at local, regional and national levels.

Self Sufficiency (rWFD – Article 16)

2.12 The principle of self sufficiency seeks to enable the provision of an integrated and adequate network that moves us towards the aim of self-sufficiency in waste recovery and disposal. The principle should not be taken to mean, however, that Wales, or indeed each Member State, must have the full range of waste facilities for dealing with all waste types which fall within the auspices of the article 16 obligation. The waste we cannot prevent should

¹⁶ Directive 2008/98/EC on waste, OJ [2008] L321/1 Article 16.

be regarded as a valuable resource and facilitate high quality recycling and use within Wales by Welsh industry. However, in doing so, account should be taken of geographic circumstances and or the need for specialised installations for certain types of waste.

Protection of Human Health and the Environment (rWFD – Article 13)

2.13 Planning authorities should ensure that all types of waste facilities are located where a high level of protection for the environment and public health can be ensured. In particular, waste management should be undertaken:

- without risk to water, air, soil, plants, or animals;
- without causing a nuisance through noise or odour; and
- without adversely affecting the countryside or places of special interest.

2.14 Planning authorities should take into account the need to secure a high level of protection for human health and the environment alongside other planning considerations. The impact of a proposed waste disposal or waste recovery operation falling within the definition of a regulated facility under the Environmental Permitting (England and Wales) Regulations 2010 (as amended) will be considered by the permitting authority in depth, and controlled through the bespoke conditions established in the permit. Planning authorities should take into account the ability of Environmental Permits to control the operations of waste facilities and its interactions with environmental media and, whilst being mindful of not duplicating control more appropriately imposed as part of the permit, consider the conditions which should be needed to accompany the planning consent. It would be good practice to seek to parallel track applications for planning permission and authorisations required under pollution control legislation where this is possible.

CHAPTER 3: STRATEGIC PLANNING FOR WASTE

3.1 *TZW*, along with the CIM Sector Plan, sets out a long term framework for resource efficiency and waste management in Wales up until 2050, taking into account social, economic and environmental outcomes. This includes short to medium term plans for the waste infrastructure needed in Wales to manage residual waste arisings, as part of the longer term transition to a resource efficient, high recycling society. In short the planning response needs to create the conditions for contributing to both short and longer term waste management goals.

3.2 In the short to medium term there will be a continued need for increased recovery and reduced disposal of residual mixed wastes which are incapable of being recycled, and thus a need across Wales to develop more residual waste treatment and recovery facilities, in order to reduce reliance on landfill and to support the overall aims of *TZW* and the CIM Sector Plan. An effective approach will be dependent on collaboration at a regional level.

3.3 At the same time, the longer term aim is an infrastructure network based on higher levels of re-use and recycling. Planning authorities should provide an enabling framework for the development of all types of waste infrastructure indicating, as far as possible, the locations to which waste management facilities should be directed. This can be facilitated through Local Development Plans (LDP).

3.4 Some wastes, such as hazardous waste, can only be addressed at an England and Wales level and this is recognised in the CIM Sector Plan. It is not considered necessary, therefore, for any further action through LDPs. However, the implications of these for development management are covered in Chapter 5.

Regional Collaboration

3.5 In taking appropriate steps to establish an integrated and adequate network of waste disposal installations and installations for the recovery of mixed municipal waste, the CIM Sector Plan recognises that there is a difficult balance to be struck to ensure we have sufficient capacity to manage our arisings in the short term without impeding the achievement of the Welsh Government's long term goal of a high recycling society and minimal landfill.

3.6 It is difficult to predict with complete certainty future needs for the disposal of waste and recovery of mixed municipal waste due to the variety of factors that affect future tonnages and actual existing capacity. However, the rWFD requires that waste disposal and recovery of mixed municipal waste should be undertaken at one of the nearest appropriate installations to the source of the waste arising. This does not carry with it the expectation that all areas should be self sufficient in terms of the network. At the strategic level, therefore, implementation of the proximity principle may mean that waste arising in one area is best treated or disposed of in a neighbouring local authority area or region and that the envisaged 'network' of infrastructure is

likely to be spread over a wider area than a single local authority administrative boundary. However, in line with sustainability principles, there is an expectation that all areas should be prepared to accommodate infrastructure to support the development of an adequate network, be it an actual recovery treatment plant, an intermediate treatment facility or any supporting infrastructure such as transfer stations.

3.7 The Welsh Government considers that some collaboration between Local Planning Authorities is necessary to monitor progress towards establishing an integrated and adequate network for the disposal of waste and recovery of mixed municipal waste. It does not expect further waste assessment work to be undertaken at the regional level (or LDP) as the CIM Sector Plan already provides the strategic starting point. Monitoring will be important because:-

- there is a need to ensure that sufficient landfill capacity can be maintained across the three regions of Wales to treat waste which cannot be treated further up the waste hierarchy;
- to ensure that sufficient treatment capacity for the recovery of mixed municipal waste across the three regions of Wales comes forward; and,
- to avoid the prospect of overprovision of disposal capacity and that of treatment capacity for the recovery of mixed municipal waste, so as not to undermine the longer term aspirations of higher reuse and recycling and tie up land which could otherwise be used to support other sustainable uses.

3.8 Therefore, the monitoring of planning permissions and environmental permits will help build up a picture of the potential amount of new waste management capacity coming on stream for future years. It will enable comparison to be made between the forecasted need range outlined in the CIM Sector Plan and what is available or planned. It will provide a spatial pattern of waste infrastructure and assist with assessing progress towards the overall development of the integrated and adequate waste facility network.

Monitoring arrangements

3.9 Welsh local authorities in conjunction with the Welsh Government and NRW are expected to establish voluntary joint arrangements to undertake annual monitoring for each region. These are essential to help implement TZW, the CIM Sector Plan and to help meet the obligations in the rWFD.

3.10 The Environment Agency (NRW from 1st April 2013) currently provides information on the type and quantities of waste handled by permitted waste management facilities in Wales, including the remaining landfill capacity for each region and facilities which treat mixed municipal waste. This information will provide a key evidence base for the provision of the annual monitoring report and the monitoring approach should build on the reporting requirements of NRW.

3.11 Joint monitoring will enable both Welsh Government and local planning authorities to take a strategic overview of, and be able to respond to, issues and trends, as well as providing an up-to-date context for taking decisions on planning applications. The joint arrangements will be technical in nature and will be established within 6 months of the publication of this advice note.

Data Collection

3.12 When considering capacity requirements it will be necessary to look at landfill capacity, measured in terms of total capacity or void space, separately to that of recovery which can be considered in terms of tonnes per annum. Monitoring is required on an annual basis of:

- existing operational, permitted and closed residual mixed municipal waste facilities to ascertain approximate operational capacity to inform planning decisions;
- existing operational and permitted landfill capacity to ascertain the existing void relative to the trigger point identified in this TAN;
- permissions (planning consent and/or environmental permit) applied for and granted for new or extended facilities and the capacity of those additional or extended facilities, including where permission has been granted, whether they are operational or are under construction, and the main types of waste they will manage;
- sites where operation is suspended for any reason;
- sites that have been closed or have reached the end of their lifetime; and,
- progress on the different procurement programmes.

Annual Monitoring Report

3.13 The information on landfill void and operational recovery capacity will be collated by a lead local planning authority in each region and published in an Annual Monitoring Report.

3.14 The Annual Monitoring Report should:

- provide up-to-date/annual data, at a regional level, on landfill void (including spatial adequacy of the void) and residual municipal waste disposal and recovery capacity (operational and planned but not built);
- Set the capacity data against up-to-date residual waste arisings data to inform capacity requirements and regional capacity need
- Record progress on the procurement programmes and consider the implications for the capacity gap and record the sites which are being proposed to support the procurement programmes, as far as this information is publicly available, so as to prompt any necessary action through LDPs;
- provide an update on LDP progress, with particular reference to the fulfilment of Art 16 obligations.

Monitoring and triggers for further action

3.15 Wales is in a period of transition in the management of waste. The infrastructure required to facilitate the implementation of *TZW* and the CIM Sector Plan should ultimately be enabled through the identification of suitable sites for disposal and recovery infrastructure for mixed municipal waste, as appropriate.

3.16 Using the information collected in the annual monitoring report each regional grouping of local planning authorities should identify where landfill capacity falls below an **[8 year]** void in a region¹⁷. This is the level at which the void is considered sufficient and should be maintained. Where capacity falls below this level, local planning authorities should collaborate to identify suitable sites for future provision.

3.17 An **[8 year]** trigger should provide sufficient time to seek an allocation in a local development plan and encourage the market to come forward, bearing in mind the political sensitivities surrounding landfill provision and the costs and time involved in set up.

3.18 Once a trigger point has been reached a site search and selection process should be undertaken at the regional level by the lead authority on behalf of the constituent authorities in the region and with the support of Welsh Government and Natural Resources Wales. The purpose of the exercise will be to identify a list of preferred suitable sites (a minimum of two suitable sites) for landfill which could appropriately fulfil the identified need in the region. To ensure landfill sites do not pose a serious risk to the environment, in proposing a suitable location for a landfill, the following considerations must be taken into account:

- the distance from the boundary of the site to residential and recreational areas, waterways, water bodies and to other agricultural or urban sites;
- the existence of groundwater, coastal water or nature protection zones in the area;
- the geological and hydrological conditions of the area, including flooding, subsistence, landslides or avalanches; and,
- the protection of areas of acknowledged landscape, cultural and nature and geological conservation.

3.19 The areas of search maps, prepared to support the regional waste plan first reviews, for open-air facilities will also provide a useful starting point for site search, however, other detailed information and local knowledge will be invaluable. Once the sites have been agreed by the regional grouping this should be reported as a supplement to the annual monitoring report and translated into an allocation in the relevant LDP at the earliest opportunity. The strategic environmental assessment and habitats regulation assessments of LDPs will enable the proposed preferred locations to be further tested in a

¹⁷ Options are being consulted upon (see the Consultation Document) in regard to the landfill void trigger (6, 8 or 10 years) and the method by which the void should be calculated.

robust and transparent way. It is expected that each constituent local planning authority would need to endorse the supplement site search report. In the event that agreement cannot be achieved then the matter should be referred to Welsh Government, in order that an appropriate solution can be found.

3.20 The CIM Sector Plan outlines the increased potential for recovery treatment capacity to come forward, and it is likely that this will take place primarily through the on-going procurement programme being taken forward by the Local Authority consortia. These projects should be supported by local planning authorities in order that the existing capacity gap for recovery facilities can be closed. Until planned capacity becomes operational, continued co-operation between local authorities will be required to ensure the capacities which are needed in each region can be provided. Not all local planning authorities will need to provide for the sub-regional or regional type of facilities which are required as part of ensuring an integrated and adequate network is provided. Therefore, as part of the annual monitoring process information on whether and how the capacity gap is being closed will be provided. At the same time, the annual monitoring report shall provide an updated regional position on the likely sites coming forward to facilitate the provision of these facilities, or identify where further provision through LDPs may be necessary.

Local Development Plans

3.21 As outlined in the previous section, regional collaboration is necessary to address installations for those wastes covered by Article 16 of the rWFD. However, the locational requirements of all types of waste facilities should be considered when preparing local development plans so as to ensure the provision of a wide range of waste management infrastructure can be facilitated.

3.22 Advances in technology and the introduction of new legislation, policies and practices mean that many modern in-building facilities appear similar to any other industrial building and on the inside contain industrial processes or energy generation activities that may be no different to many other modern industrial processes in terms of their operation or impact. For this reason, many general employment sites and major industrial areas are likely to be suitable locations for the new generation of waste facilities but this will depend on a variety of local factors, including the nature of existing users and the strategy adopted for particular employment sites.

3.23 A separate approach for recovery or intermediate treatment for mixed municipal waste, as opposed to that for other types of facilities, including supporting infrastructure, may not be required at the LDP level. However, before arriving at a conclusion, each local planning authority should take some specific actions in relation to recovery treatment for mixed municipal waste to ascertain whether support for any local authority procurement programmes is necessary (this may also be the case for food waste treatment) and to reflect any agreement contained in the regional annual

monitoring report, or whether any opportunities exist to derive benefits from facilitating co-location and the development of heat networks. The latter could form part of the renewable energy assessments envisaged as part of TAN 8. In line with paragraph 3.16 above, landfill will only need to be addressed in particular circumstances at the LDP level and by particular local planning authorities.

3.24 Therefore, as well as reflecting any position on recovery treatment agreed at the regional level or as part of the procurement programmes, LDPs should indicate that they have considered opportunities for gaining the benefits offered by co-location and for facilitating the provision of heat networks. If no such opportunities exist in the LDP area then generally the amount of land required to provide for recovery and intermediate treatment facilities or food waste treatment, along with a range of other recycling, reprocessing/remanufacturing and waste collection/transfer facilities will not be identified separately but be part of considering employment land allocations within LDPs.

3.25 Employment Land Supply Surveys (see Chapter 7 of PPW) will not be expected to specifically take into account separate provision for waste facilities, but as part of allocating employment land local planning authorities should indicate where suitable and appropriate sites exist for the provision of all types of waste management facilities in order to provide some certainty for waste operators interested in fulfilling demand in an area. As part of this local planning authorities should directly engage with the waste industry and their own waste managers to determine whether there are any spatial requirements in their local authority areas.

3.26 Where necessary criteria based policies may be used to identify what types of facility may be acceptable as part of a specific allocation or as part of a general indication of suitable employment sites. It is expected that facilities for recycling and remanufacture can be appropriately accommodated on many general employment sites, providing suitable access and transportation is available, however there may be site specific reasons for these being located elsewhere. An indication that suitable employment land is available is considered appropriate and the take up of sites by waste management users should be monitored as part of annual monitoring of LDPs.

3.27 Where buildings are to be demolished the resultant materials may be recycled on site using temporary plant and machinery where it would be appropriate, and would not cause a detrimental impact on neighbours in terms of noise or dust. Where there are longer term prospects for a sufficient and economic supply of demolition and construction waste from an appropriate catchment area, it may be appropriate to identify a permanent recycling repository or 'urban quarry' for this purpose. Local planning authorities should include criteria based policies, or preferably identify suitable sites, to guide the location of repositories or 'urban quarries' for construction and demolition waste to avoid unnecessarily landfilling of inert waste.

3.28 Adequate facilities and space for the collection, composting and recycling of waste materials should be incorporated into the design of any development and waste reduction efforts at the design, construction and demolition stage should be made by developers. All opportunities should be explored to incorporate re-used or recyclable materials or products into a new building or structure. LDP strategies and policies proposing development should encourage the provision of adequate and effective waste receptacles for recycling and indicate that they expect developers to take advantage of any opportunities to reduce waste as part of the design and construction of new buildings. It may be appropriate to prepare supplementary planning guidance, particularly where there are site specific factors to take into account, and this could provide the basis for seeking local agreements for taking responsibility for the on-going management of such receptacles where this is appropriate.

Location of waste management facilities

3.29 Locations should be considered within the context of the aims of *TZW*, the CIM Sector Plan, the regional 'Areas of search maps', and the overall strategy of the LDP. In general, the most appropriate locations will be those with the least adverse impacts on the local population and the environment, and with the best potential contribution to a broad infrastructure framework. Particular care should be taken to avoid locations where new or extended waste facilities may be incompatible with existing land-uses.

3.30 There are numerous factors that may influence the type of location of new waste management facilities and which local planning authorities should consider the following as part of preparing local development plans and the Strategic Environmental Assessment (SEA) and Habitats Regulations requirements for LDP will assist in making these explicit. New sites might for instance, be located, if appropriate, within or adjacent to:

- industrial areas, especially those containing heavy or specialised industrial uses;
- active or worked out quarries - landfill is commonly used in quarry restoration but there may be opportunities for other types of waste management facilities at some quarried sites. It should be noted that quarry depth and the nature of the local water table will affect the feasibility of using such sites;
- degraded, contaminated or derelict land - well-located, planned, designed and operated waste management facilities may provide good opportunities for remediating and enhancing sites which are damaged or otherwise of poor quality, or bringing derelict or degraded land back into productive use;
- existing or redundant sites or buildings - which could be used, or adapted, to house materials recycling facilities, or composting operations;
- sites previously or currently occupied by other types of waste management facilities;
- on farms where the output will be used on the farm.

And/or where:-

- there are opportunities to expand existing in-building and open-air facilities or to site a new type of facility alongside an existing facility;
- site infrastructure (including electricity grid connections for energy from waste facilities) is present;
- there are existing or proposed transport infrastructure links – including opportunities for integrated multi-modal road, train, canal and sea connections;
- the nature of existing and proposed neighbouring land uses facilitates the location of waste management infrastructure;
- there is a need for sites for smaller-scale community based reuse and recycling activities;
- there are existing planning permissions / Environmental permits;
- there are opportunities for co-locating waste management / resource recovery / reprocessing / re-manufacturing facilities to form environmental technology clusters;
- the cumulative effect of waste management facilities and other development on sensitive environmental receptors is acceptable;
- the cumulative effect of waste management facilities and other development on the well-being of the local community, including any significant adverse impacts on environmental quality, social cohesion and inclusion or economic potential is acceptable.

3.31 To help ensure progress towards the aspirations set out in *TZW* and the CIM Sector Plan and to meet any outstanding obligations of the rWFD, early implementation of the guidance in this section is expected.

3.32 LDP's are at various stages of preparation and, whilst local planning authorities are not required to repeat national policy in their own plans, they should have regard to the provisions within this TAN at the earliest opportunity. In the case of adopted LDP's this will mean consideration of the issues identified in the TAN as part of the annual monitoring review.

CHAPTER 4: DEVELOPMENT MANAGEMENT

4.1 When considering development proposals for waste management facilities planning authorities should take into account the principles outlined in Chapter 2, Annex C and any updated position derived from work undertaken in relation to chapter 3 (annual monitoring reports and supplements). Decisions should be taken in accord with the relevant development plan for the area and take into account the national waste policy context.

Waste Planning Assessment

4.2 To enable proper consideration of the principles contained in the TAN, a Waste Planning Assessment should be submitted with all applications for a waste facility. The purpose of the Waste Planning Assessment is to ensure that the information necessary for making a decision is provided by the applicant when a planning application is submitted. The Waste Planning Assessment should be appropriate and proportionate to the nature, size and scale of the development proposed. Further advice can be found in Annex B.

4.3 Where the planning authority considers that the level of information submitted is insufficient to enable it to make a decision, it should use its powers to request further information, which may lead to a delay in determination. Where requested information is not forthcoming this may constitute a reason for refusal.

Applying the Waste Hierarchy

4.4 The waste hierarchy should be applied to all waste proposals, although it is acknowledged that the hierarchy itself is not absolute nor is it the only determining factor. Departure from the waste hierarchy should be justified on the basis of Best Overall Environmental Outcome (BOEO) identified through the use of Life Cycle Assessment (LCA). This will need to form part of the Waste Planning Assessment produced by the applicant.

4.5 Whilst the guidance referred to in paragraph 2.8 was not developed specifically to support a planning decision, it represents the key starting point for decision making, along with the outcomes of any LCA required to justify a departure from the waste hierarchy. Where LCA is necessary to justify a proposal, planning authorities should draw on the expertise in NRW to assist with evaluating the LCA. NRW will be consulted, as appropriate, by planning authorities on waste applications and where required should assist planning authorities in coming to an appropriate judgement on matters relating to the waste hierarchy.

4.6 The waste hierarchy principle should be set alongside other relevant social, economic and environmental factors, including the amenity of adjacent uses and communities, before the appropriateness of potential developments can be determined.

4.7 For waste proposals falling within the ambit of Article 16 of the rWFD (disposal of waste or recovery of mixed municipal waste) an integrated and adequate network of facilities should be provided. Some facilities utilise intermediate treatment processes and are not 'stand alone' methods of treating waste and by their nature can only operate in conjunction with other facilities. In applying the waste hierarchy to such proposals it will be appropriate to consider the wider network and how the proposal fits within it.

Applying the proximity and self sufficiency principles - facilities for the disposal of waste and recovery of mixed municipal waste

4.8 The CIM Sector Plan sets the continued need for increased recovery and reduced disposal of residual mixed waste which are incapable of being recycled, in the short to medium term. Therefore, across Wales a need exists to develop more residual waste treatment and recovery facilities and to ensure that sufficient disposal capacity is maintained at a level appropriate to support the overall aims of *TZW* and CIM Sector Plan.

4.9 It is difficult to predict with complete certainty the future needs for residual mixed waste treatment, recovery and disposal due to the variety of factors that affect future tonnages and actual existing capacity. The CIM Sector Plan recognises that there is a difficult balance to be struck to ensure we have sufficient capacity to manage our residual mixed waste arisings in the short term without impeding the achievement of the Welsh Governments long term goal of a high recycling society and minimal landfill.

4.10 Planning authorities should facilitate the provision of both recovery and disposal infrastructure, where appropriate, using the proximity and self sufficiency principles to establish whether there is a demonstrable need for such infrastructure. Evidence on how the proximity and self sufficiency principles have been applied to both waste disposal installations and installations for the treatment of mixed municipal waste will need to form part of the Waste Planning Assessment produced by the applicant.

4.11 There are likely to be social, economic and environmental benefits in favour of proposals which seek to address an identified need. The presence of facilities outside of Wales or a region defined in the CIM Sector Plan should not be used as a reason to refuse an application which can be shown to be required to satisfy an identified need in the area in which it is being proposed.

Installations for the recovery of mixed municipal waste

4.12 Whilst the CIM Sector Plan seeks to encourage the provision of sufficient capacity of recovery infrastructure, this has to be complementary to the overall aim of driving the treatment of all waste further up the waste hierarchy. It models a set of forecast scenarios for residual mixed waste quantities for 2024/25 and 2049/50¹⁸ and presents these at a regional level.

¹⁸ The Welsh Government (July 2012) Collections, Infrastructure and Markets Sector Plan at p.73.

Overprovision of recovery treatment should be cautioned against as much as under provision. For this reason, planning authorities should give consideration to the circumstances prevailing at any given time, however, the upper threshold of the capacity ranges identified in the CIM Sector Plan (or any subsequent update) is likely to represent the point at which the extent of provision in a region can be considered to be sufficient. The proposed provision of capacity which exceeds this upper threshold is likely to be unnecessary in the context of the overall aims of the CIM Sector Plan but the variables involved require careful consideration. The annual monitoring reports prepared by each lead authority should provide up to date information and should be taken into account in determining the level of need for recovery treatment capacity.

4.13 To determine whether there is sufficient capacity for recovery treatment to serve an area will depend on a variety of factors. The CIM Sector Plan represents the starting point for the determination of need for future capacity. It should be noted that the capacity ranges in the CIM Sector Plan do not take into account any double handling of waste as a result of intermediary treatment options, nor do they account for the movement of waste between Wales and England. There may be particular spatial factors which have a bearing on whether facilities are needed and these may be subject to change, for example, over time some facilities may cease to operate, or the type of facility being proposed may require taking into account the availability of, or need for, final treatment capacity to deal with the output from any intermediary treatment technologies.

4.14 Where planning permissions already exist in an area (region) they should be taken into account in determining the level of need. However, the significance which can be attached to such permissions in determining the level of need will vary depending on the likelihood of facilities being built. Evidence of pre-commencement conditions having been discharged and of an environmental permit being in place are indicators that facilities are more likely to be built. In the interests of increasing certainty planning authorities should encourage and engage with applicants on the submission of any information needed to approve pre-commencement conditions.

4.15 The prospects of existing planning permissions being implemented and facilities being built will also be influenced by relevant economic and financial factors, and there may be valid reasons for operators to be unwilling to declare their intentions. However in the interests of avoiding over provision of recovery facilities which could undermine *TZW* and the CIM Sector Plan, planning authorities should try to ascertain as far as possible the up to date position with regard to the prospects of existing planning permissions becoming operational facilities, and waste operators are encouraged to cooperate as far as possible. The annual monitoring reports should assist in this process.

4.16 The capacity ranges for residual waste treatment in the CIM Sector Plan excludes permitted Refuse Derived Fuel (RDF) capacity in cement kilns in Wales. This is because the current operational use is negligible and this is considered unlikely to change. This situation will be kept under review and should this capacity increase in significance and become available then the Welsh Government will publish revised figures accordingly. The use of cement kilns for residual waste treatment should not be precluded. Any such use is largely a matter for the permitting authority and caution is needed prior to changes in the operating conditions of these facilities.

4.17 It may be appropriate to consider refusing planning permission should the level of provision exceed the upper range identified in the CIMS Plan for any given region. Where such circumstances exist proposals may be refused unless there is clear justification for supporting them. Whilst circumstances will vary, overprovision will only be justified on the basis that the proposal represents a sustainably located facility. In coming to such a judgement planning authorities will wish to see the demonstration of social, economic and environmental benefits.

4.18 Applicants will have to clearly justify why a proposal is necessary and where it cannot be clearly demonstrated that the need for the proposal outweighs the position in this TAN on overprovision, planning permission should be refused. Evidence to support proposals should be incorporated in the Waste Planning Assessment and include, as far as possible, the source the waste will be obtained from. In coming to a decision a number of related factors will be relevant, including:

- whether there has been an unexplained and unjustified deviation from the waste hierarchy;
- whether the use of sustainable transport methods appropriately mitigates against an otherwise poorly located proposal;
- whether the proposal is to deal with waste arisings entirely, or predominantly within Wales or a particular region;
- whether a facility is well placed to take waste from outside of Wales and economic, social and environmental benefits can be demonstrated;
- whether co-location of several facilities may justify the importation of waste over a wide catchment;
- whether overall waste arisings are so small as to justify a wide catchment over which waste can be imported.

4.19 Arisings of hazardous waste are low and as a result an unnecessarily restrictive approach should not be taken to the location of such facilities. Some facilities will be able to take alternative feedstocks and as a result the need argument is not clear cut and careful consideration will be necessary.

Waste disposal installations

4.20 The Welsh Government has a long term aim of eliminating landfilling as far as possible¹⁹. *TZW* sets limits on the total amount of residual municipal waste and industrial and commercial waste sent to landfill. The maximum level of landfill of municipal waste and of industrial and commercial waste collected by local authorities is 10% by 2019/20 and 5% by 2024/25. Planning authorities should support proposals for waste treatment, recycling, preparation for re-use and reuse facilities which aim to divert waste from landfill to more sustainable waste management options taking into account the waste hierarchy as a priority order and the objective of delivering a high level of protection for human health and the environment.

4.21 Modelling undertaken for the CIM Sector Plan demonstrates that, depending on waste arising and recycling scenario modelled, Wales may need to develop additional Non-Hazardous Landfill capacity prior to 2025. Adequate landfill capacity is required for the landfill of residual waste until the new recovery facilities are in place and the goal of zero landfill is attained²⁰. The monitoring of landfill capacity requirements will be undertaken at a regional level and the annual monitoring reports prepared by each lead authority should be taken into account in determining the level of need for landfill in any locality.

4.22 The level at which the void in each region is considered sufficient and should be maintained is **[8 years]**²¹. New proposals for landfill will require exceptional justification with reference to the waste hierarchy and the proximity and self sufficiency principles, the updated position contained in the annual monitoring reports (and supplements) and on the grounds of sustainability.

4.23 It is expected that adequate landfill capacity will be required in the longer term for legacy wastes such as asbestos and other such wastes where landfilling remains the best overall environmental outcome. It is also expected that as waste prevention and recycling targets are met, restrictions on certain wastes to landfill are introduced and recovery facilities for residual mixed waste are developed, the amount of waste going to landfill will reduce significantly. This will extend the lifetime of existing landfills. Indeed, the application of the waste hierarchy suggests that landfilling inert waste is not acceptable in most circumstances and without exceptional justification planning applications for inert landfill should be refused. The restoration of quarries using inert waste may prove to be an exception and in such

¹⁹ The Welsh Government (June 2010) Towards Zero Waste: One Wales One Planet at p.47. Available online at: http://wales.gov.uk/topics/environmentcountryside/epq/waste_recycling/publication/towardszero/?lang=en

²⁰ The Welsh Government (July 2012) The Collections, Infrastructure and Markets Sector Plan at p.225.

²¹ Options are being consulted upon in regard to the landfill void trigger (6, 8 or 10 years) and the method by which the void should be calculated.

circumstances close working between planning authorities and NRW will be necessary to achieve a satisfactory outcome.

Consultation

4.24 Planning legislation requires local planning authorities to publicise applications and to consult NRW and other public bodies with relevant environmental responsibilities. The general public must also be given an opportunity to express their views about the proposals, before a decision is made.

4.25 Developers preparing applications for waste management developments should undertake consultation with the planning authority and with local communities at an early stage, preferably well before an application is submitted to ensure comprehensive and meaningful public consultation. It is likely that pre-application discussion will be necessary to determine what information should be included as part of the WPA. Consultation should be undertaken, where known, with local community groups.

4.26 As part of the decision making process, planning authorities should satisfy themselves that the level of consultation undertaken is commensurate with the nature and scale of the proposal under consideration. Public 'ownership' and openness are important as a significant change of attitudes toward waste resources is needed to achieve the changes required. In this spirit of co-operation it is important to establish or develop further, partnerships between local authorities, the waste management industry, NRW, and other interested or advisory groups and organisations. Planning applications for waste management facilities should, where appropriate, be the subject of consultation with the department dealing with waste management or with the waste management authority (in the case of National Park Authorities) and NRW.

Environmental Impact Assessment

4.27 All projects that fall within Schedule 1 to the Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999²² must be subject to Environmental Impact Assessment (EIA), before development consent can be granted. These include waste disposal installations for the incineration and chemical treatment of all hazardous waste and of other waste where the capacity of the installation exceeds 100 tonnes per day and landfill.

4.28 For all Schedule 2 development, including that which would otherwise benefit from permitted development rights (see paragraph 6.12), the local planning authority must make its own formal determination as to whether EIA is required (referred to in the Regulations as a "screening opinion"). Waste

²² Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999, SI 1999 No.293.

proposals comprise Schedule 2 development if any of the following apply (Column 2 of the table in Schedule 2):

- disposal is by incineration; or
- the area of the development exceeds 0.5 hectare; or
- the installation is sited within 100 metres of any controlled waters; or
- if any part is within a “sensitive area” as defined in Regulation 2(1) of the 1999 EIA Regulations.

4.29 As part of undertaking an Environmental Impact Assessment the actual and/or potential impacts on human health and wellbeing arising from the proposal should be identified.

Habitats Regulations

4.30 European sites are critically important biodiversity assets in Wales, and as such, their protection is a key component of sustainable development. TAN 5 Nature Conservation provides policy and procedural advice in this regard and should be referred to in all instances where there is potential to affect a European Protected Site (or any other nature conservation interest) as part of proposals for waste management.

Town and Country Planning (General Permitted Development) Order (GPDO) 1995 (As amended)

4.31 Certain operations involving the deposit of waste may fall within one of the classes of permitted development under the Order:

- Waste material can be deposited on agricultural land, subject to certain conditions, where the operation is reasonably necessary for the purposes of agriculture within that agricultural unit. If the total area used for waste deposit exceeds 0.5 hectares, prior approval is required from the Local Planning Authority (Part 6).
- Waste material can be deposited for the formation or maintenance of private ways on forestry land provided it is reasonably necessary for that purpose (Part 7).
- Waste material (not including mineral waste) resulting from an industrial process can be deposited on industrial land provided it was being used for that purpose on 1 July 1948 (Part 8).
- Waste material (not including mineral waste) can be deposited by a local authority on any land that was in use for that purpose on 1 July 1948 (Part 12).
- Waste tipping at mineral workings is set out in Part 21, and removal of material from mineral-working deposits in Part 23.

4.32 It should be noted that the operations listed above are likely to require an environmental permit or to be registered as an exemption and liaison with NRW is advised.

CHAPTER 5: TYPES OF WASTE MANAGEMENT FACILITY

5.1 This section provides guidance on the types of planning issues raised by mainstream waste management facilities. Further detailed planning considerations are provided in Annex C. Where a proposal is environmentally unacceptable or would cause impacts on amenity and where these problems cannot be mitigated to an acceptable standard by conditions, planning permission should be refused.

5.2 Waste management facilities will vary greatly in size, type of waste treated and operational characteristics and so too will their potential impact on the environment, amenity, society and the economy. New innovative technologies may emerge over time that will establish themselves as deliverable, reliable and proven methods for treating mixed municipal and residual waste. Local planning authorities should be mindful of the pace of technological and technical change in the waste management sector. Technologies not addressed in TAN 21 and the freestanding practice document, “Waste Planning: Practice Guidance”²³ should be considered with reference to the waste hierarchy and lifecycle assessment. [See Chapter 2]

5.3 The guidance in this section on the types of planning issues posed by the main types of waste management infrastructure is not intended to be exhaustive. Each proposal should be considered on a case by case basis, taking account of factors including the nature, type, size, need and location of the development. Site specific issues will vary depending on the scale, waste treated and the nature of the proposal and its proposed location. Further information on detailed planning considerations can be found in Annex C. More detail on technology types, including case studies, will be made available in the Waste Planning: Practice Guidance.

Disposal Facilities

5.4 Whilst the ultimate goal of the Welsh Government is zero waste to landfill, it is recognised that disposal to landfill or disposal through incineration without heat recovery, or with inefficient heat recovery, will continue in the short to medium term (to 2024/25)²⁴. This is partly, due to the way in which waste is collected, partly due to the infrastructure capacities we have to deal differently with our waste, and partly as a result of legacy wastes and incineration residues (where no safe alternative to ultimate landfill disposal and the development of alternative markets for use of these materials as products currently exists).

²³ This will be a Companion Guide with case studies of various technologies. It is not a policy document and it will be updated to reflect new case studies. It will be available prior to the adoption of TAN21.

²⁴ ‘Disposal’ means any operation which is not recovery even where the operation has as a secondary consequence the reclamation of substances or energy. Article 3(19), Directive 2008/98/EC on waste and repealing certain Directives.

5.5 Public concern often centres around landfills, predominantly due to the perceived health and environmental hazards posed by this form of waste management. At present, there is no identifiable need for further landfill capacity and the likelihood of such a need arising should reduce over time as the new waste prevention, recycling and other recovery activities develop in accordance with waste policy targets and actions. However, should a need for further landfill capacity arise in the future, concern can be dispelled through transparency of the planning process and a clear consideration given to mitigating any potential negative impacts such as those set out in Annex C to this document.

5.6 Municipal waste incinerators and energy from waste facilities which fall below the R1 energy efficiency threshold are considered to be disposal facilities for the purpose of the waste hierarchy. [See Chapter 2 and Chapter 5 below].

5.7 Low energy efficiency Energy from Waste (EfW) facilities may be considered to offer a waste management solution for arisings of mixed household, industrial and commercial waste in Wales. Whilst use of these types of facilities may be preferable to landfill disposal (depending on the results of any individual life cycle assessment), they are not the Welsh Government's preferred option. Local Planning Authorities should encourage development of high energy efficiency facilities wherever possible²⁵. Proposals for developments falling under disposal and recovery operations should explain in the Waste Planning Assessment, set out in Annex B, where the proposal fits within the waste hierarchy and why it represents the best overall environmental outcome where alternative technologies or increased energy efficiency is possible.

Disposal of Niche Wastes

5.8 Most low energy efficiency EfW incinerators used for disposal purposes deal with niche wastes, such as animal carcasses or clinical wastes. These incinerators tend to be less capable of recovering energy efficiently due to the composition and nature of their wastes. Whilst low efficiency EfW facilities offer a solution for some wastes, they do not necessarily provide the best overall environmental option. Proposals operating low-efficiency outputs should demonstrate through the Waste Planning Assessment where and how the proposal fits with the waste hierarchy and why it represents the best overall environmental outcome where alternative technologies or increased energy efficiency is possible.

5.9 Waste incinerators can pose planning issues relating to air emissions, odour, vermin, ground water, transport and access. These can be dealt with at the planning stage and by the Environmental Permitting regime through conditions set out in relation to the housekeeping and operation of the facility.

²⁵ Treatment of residual waste in high efficiency energy from waste facilities yield significant reductions in greenhouse gas emissions as compared to other treatment options that include an element of landfilling, as verified by life cycle assessment studies. Welsh Government (July 2012) *Collections, Infrastructure and Markets Sector Plan* at p.218, para 3.6.2.2.

Recovery Facilities

5.10 Recovery is defined as any operation the principal result of which is waste serving a useful purpose by replacing other materials which would otherwise have been used to fulfil a particular function, or waste being prepared to fulfil that function, in the plant or in the wider economy²⁶.

5.11 Recovery operations can be broken down into other recovery and energy recovery. The main techniques under other recovery for mixed municipal waste (or fractions derived from it following intermediary treatment²⁷) include:

- Energy recovery, including: incineration, co-incineration (e.g. in a cement kiln), anaerobic digestion, pyrolysis and gasification (including plasma gasification) with energy recovery with residues (incinerator bottom ash and air pollution control residues) being recycled or landfilled;
- Landspreading of compost like output (CLO)²⁸ on non-agricultural land (CLO) as a waste under an environmental permit.
- Landspreading of segregated biowaste for agricultural or ecological benefit²⁹;
- Use of waste glass, separated through intermediary treatment processes, as a secondary aggregate³⁰.

Energy from Waste (EfW)

5.12 Technologies such as energy recovering waste incinerators can offer a suitable technique for maximising the social, environmental and economic benefits from the management of residual wastes (that waste remaining after reuse, preparation for reuse and recycling actions has been undertaken). Local Planning Authorities should be mindful of the need to divert waste away from landfill and the opportunities offered by energy from waste facilities to harness resources in the form of energy for heat and/or power from residual waste.

²⁶ Article 3(15) Directive 2008/98/EC on waste and repealing certain Directives OJ 2008 L312/3. See also, Welsh Government (July 2012) *Collections, Infrastructure and Markets Sector Plan* at p.217.

²⁷ Intermediary treatments are considered below and detail is provided in the Waste Planning: Practice Guide.

²⁸ The Compost like output (CLO) will be produced as a result of an intermediary treated process such as Mechanical Biological Treatment (MBT) or Mechanical Heat Treatment (MHT). CLO from biological treatment facilities (as discussed below) can be spread on agricultural land and other land but remain waste and may require an environmental permit unless spread on agricultural land. See, Environment Agency (April 2012) U10: Spreading Waste on Agricultural Land to Confer Benefit.

²⁹ Where the waste has been through a treatment process to produce a product in accordance with the relevant quality protocol, for example PAS 100 or PAS 110, the material will be considered to have reached a certain quality standard to meet the level of environmental protection offered by recycling.

³⁰ As above in footnote 6.

5.13 Proposals that incorporate combined heat and power (CHP) could contribute toward district heating schemes for industry, for commercial developments or for large public sector developments such as schools or hospitals, providing these are environmentally acceptable. This makes the recovery of energy more efficient and it would potentially reduce the impact of using primary fuels.

5.14 The recovery of Energy from Waste (EfW) should be carried out at a high level of energy efficiency. In the case of EfW facilities using mixed municipal wastes and residual waste as a feedstock, in order to be classed as a 'recovery operation' these need to meet (as a minimum) the energy recovery efficiencies as defined under the 'R1 formula' (detailed in Annex 1 to the Waste Framework Directive). The CIM Sector Plan provides details on the way in which the efficiency of EfW facilities is calculated using the R1 formula (see CIM Sector Plan at p.217). EfW facilities are categorised as recovery installations when their efficiency, as expressed using the R1 formula, is equal to or greater than:

- 0.60 for installations in operation and permitted in accordance with applicable Community legislation before 1 January 2009 or
- 0.65 for installations permitted after 31 December 2008.

Where facilities using municipal waste, or mixed municipal and industrial wastes as a feedstock operate at an R1 efficiency level of <0.6, the operation is classed as a disposal operation for the purpose of the waste hierarchy.

5.15 Local Planning Authorities should take account of the energy efficiency of any EfW proposal, ensuring that any such facility operates or is capable of operating, at high efficiencies that minimise the environmental impacts and maximise the benefits of recovering energy from waste. This will involve consideration being given to the way in which heat is recovered from the installation. Local Planning authorities should support the development of appropriate energy recovery options for the optimal recovery of energy from residual waste in Wales, including the development of markets for heat output and processed combustion residues, as well as electricity. Combined heat and power, and heat only options, should be considered favourably where they meet high energy efficiencies.

5.16 The spatial relationship between EfW facilities and heat users should be considered by Local Planning Authorities in identifying sites in the local development plan and decision-making. Local Planning Authorities should encourage the siting of EfW installations in proximity to energy users. Likewise, Local Planning Authorities should endeavour to site energy users in proximity to existing operational EfW facilities.

Landspreading

5.17 A wide range of wastes and by-products of industrial processes are being spread on the land in agriculture, forestry and land reclamation

operations. Some materials generated from industrial processes are considered to be by-products rather than wastes so that they can be recycled to land as soil improvers and fertilisers with minimum restriction.

5.18 Biowaste and digestate can be considered as a virgin material rather than waste and can be spread on land without a permit if it conforms to certain standards³¹. However, should they not meet the quality standards set out in the relevant quality protocols and Publically Available Specification (PAS), they will require management under environmental permitting.

5.19 In making a decision, Local Planning Authorities should be satisfied that residual wastes which are not suitable for preparation for reuse, recycling or other recovery are used for the optimised recovery of energy in local applications, and to ensure that the retention of economic value in Wales from such recovery operations is maximised.

5.20 Wider community health risks should be managed at the project level through appropriate design and siting. These issues and suitable alternatives should be considered as part of EIA, where appropriate, and should be considered and controlled through conditions attached to any environmental permit provided by the regulator.

Intermediary Treatment Facilities

5.21 There are a number of technologies which provide a level of treatment of residual waste. They are regarded as intermediary treatment processes as they produce a residue that requires further management and treatment through either recovery or disposal operations.

The two main processes in use are:

- Mechanical Biological Treatment (MBT) – with the non-recyclable residues going to either energy from waste, landfill and/or landspreading;
- Mechanical Heat Treatment (MHT) and Autoclave - with the non-recyclable residues going to either energy from waste, landfill and/or landspreading;
- Chemical, Clinical or Electrical Treatment Plants

5.22 MBT combines biological and physical processes in the management and treatment of mixed household and residual waste. Waste undergoes a mechanical sorting process to separate out recyclables. The remaining waste following this first phase processing is the organic rich fraction or biodegradable fraction for biological treatment. The second phase is a

³¹ British Standards Institution (January 2011) PAS 100: 2011 Specification for Composted Materials. (BSI: London). Available to download free of charge from the WRAP website: <http://www.wrap.org.uk/> Correct February 12, 2013. Waste and Resources Action Plan and Environment Agency (September 2008) Quality Protocol Compost – The Quality Protocol for the production and use of Quality Compost of Source-Segregated Biodegradable Waste. (WRAP: Banbury). Available online at: <http://www.wrap.org.uk/content/quality-protocols> Correct February 12, 2013.

biological digestion process (aerobic decomposition and/or anaerobic digestion). Where AD is used to digest organic rich waste fraction, biogas is produced which can then be used as a source of energy.

5.23 In order to control potential odour issues there may be a need to incorporate negative pressure ventilation with air extraction within the waste reception and treatment plant areas and the use of biofilters to control odour. The location of MBT and MHT facilities in particular adjacent to sensitive receptors needs to be carefully considered. Where combined heat and power is generated by the facility consideration should be given to the location and suitability of proximate heat and/or power users.

5.24 Emissions to the atmosphere may need careful consideration where negative pressure ventilation with air extraction, or flues/stacks from associated combustion activities are proposed in relation to MBT or MHT facilities. These can be dealt with both at the planning stage and through the housekeeping and operation of the facility itself under the conditions set down in the Environmental Permit issued by the Regulator.

5.25 Transport and access should be considered in terms of the overall site, its design and location, to ensure that disruption and pollution caused by vehicles entering and egressing the site are minimised and that there is sufficient space on site for manoeuvring. Noise is not generally considered to be an issue where operations are taking place within a building, however noise from loading and unloading, and vehicles manoeuvring around the site may be an issue if it is proposed to locate such facilities in a noise sensitive area.

Physical Treatment Facilities

5.26 These types of facilities change the physical characteristics and composition of the waste. Physical treatment aims to reduce the volume of waste disposed of to landfill through the separation of waste fractions and different waste materials for onward processing, recycling and recovery operations. Many types of physical treatment facilities are intermediary infrastructure since they act as a precursor to recycling, other recovery or disposal.

5.27 Materials Recovery Facilities (MRFs) process mixed waste or co-mingled (mixed) recyclable materials for example paper, card, metal and plastics by Waste Collection Authorities (WCAs) and other third party and private waste contractors. Through various manual and automated techniques these waste materials are sorted and separated into those materials to be prepared for reuse, recycled or otherwise recovered. These facilities and other physical treatment facilities

5.28 Proposals for MRFs should be carefully considered by planners. MRFs can create significant public interest. Due to the unsorted nature of the recyclables, the potential for noise and dust emanating from the site as a

result of the transportation, transfer, handling and segregation processes should be carefully considered, along with the hours of operation of the site. Odour is rarely an issue with these types of facilities because of their composition and source, however odour may be a consideration where there is a high volume of contamination in wheeled bin comingled collections. So-called “dirty MRFs” handle a mixture of recyclable and residual municipal solid waste and sort it as one stream for onward processing. In this instance, the sorted materials are often destined for other recovery or landfill. Dirty MRFs are not a preferred waste management option due to the quality of the material output from the process. In addition, the future source segregation of collections envisaged in TZW and the CIMSP should discourage future dirty MRF proposals coming forward. Proposals for dirty MRFs would need to demonstrate using the Waste Planning Assessment, not only the need for such a facility, but that it offers a sustainable waste management option, taking into account the waste hierarchy and lifecycle assessment.

5.29 Transport and access should be considered in terms of the overall site, its design and location, to ensure that disruption and pollution caused by vehicles entering and egressing the site are minimised and that there is sufficient space on site for manoeuvring.

5.30 Other types of physical treatment facilities can be waste specific, for example facilities managing the depollution and dismantling of end-of-life vehicles or facilities dismantling waste electrical and electronic equipment (WEEE). The ultimate objective of physical treatment facilities is the same, whatever the waste input - the separation and sorting of separable waste material streams for onward processing and future use. [See the Waste Planning: Practice Guidance for more detail and case studies].

5.31 In general, physical facilities tend to treat inert materials which do not change their chemical or biological composition. This means that whilst noise is likely to require careful planning consideration, odour, dust and litter are less likely to raise substantial planning issues, although the significance of odour, dust and litter as a consideration will depend upon the waste being handled at the facility.

5.32 Facilities dealing with physical treatment, particularly those capturing metals and dismantling ELVs and WEEE, may pose a risk to groundwater due to the nature of components found in these types of wastes. The risk posed to groundwater from these activities should be considered by planners as part of their decision-making. NRW should manage more specifically the actual operations of the facility on the site in relation to the prevention and mitigation of non-natural substances entering ground waters through the Environmental Permitting Regulations.

Biological Treatment Facilities

5.33 Biological Treatment Facilities control and enhance natural biological processes to treat biodegradable organic waste materials including food

waste, green wastes and, to a lesser extent, card, paper and wood³². All biological treatment facilities involve the decomposition of biodegradable waste by living microbes (fungi and bacteria) which use biodegradable waste materials as a food source for growth and proliferation. There are two main types of biological treatment: anaerobic (in the absence of oxygen) and aerobic (in the presence of oxygen). These processes can be considered as recycling or recovery processes depending upon the quality of the output compost or digestate.

5.34 Anaerobic Digestion is a natural process where microorganisms break down organic matter (such as food waste, manures and slurries, sewerage sludge and purpose grown crops for energy) in the absence of oxygen. The process can produce both biogas and digestate. Biogas can be used in combined heat and power by burning to produce heat or cleaned and used in the same way as a natural gas or vehicle fuel. Digestate is used as a renewable fertiliser or soil conditioner. Where the AD facility satisfies BSI PAS 110 and the Quality Protocols for use as a soil conditioner or fertiliser, it will be considered as a recycling facility, where the digestate does not meet those quality standards the operations will be other recovery³³.

5.35 Due to the production of biogas and digestate in the AD process, AD is considered to have a greater potential to reduce greenhouse gas emissions than other composting treatments such as In-Vessel Composting or Open-Windrow Composting³⁴. The Welsh Government is promoting AD as the recycling route for food wastes in preference to land spreading³⁵. Local Planning Authorities should consider the preference towards and suitability of waste to AD treatment for biodegradable waste when determining a proposal for biological treatment.

5.36 In-Vessel Composting (IVC) uses a mix of food and garden waste. The treatment takes place in an enclosed environment in which the temperature is accurately controlled and monitored. The resultant compost can be used in local horticulture, amenity and agricultural markets. The facility will not be considered by the Regulator as a waste recovery operation where the facility processing the waste satisfies BSI PAS 100 for compost materials (January 2011)³⁶ and the Quality Protocol for compost³⁷. Where the relevant Quality

³² Card, paper and wood can be treated by means of biological treatment but their degradation is significantly slower. For this reason it is better to recycle or recover energy from wood and paper than it is to compost it.

³³ WRAP and Environment Agency (November 2008) Quality Protocol: Anaerobic Digestate – The quality protocol for the production and use of quality outputs from aerobic digestion of source-segregated biodegradable waste. (WRAP: Banbury). BSI PAS 110 – Producing Quality Anaerobic Digestate Available online at: <http://www.wrap.org.uk/content/bsi-pas-110-producing-quality-anaerobic-digestate> Correct February 13, 2013.

³⁴ Welsh Government (2010) Towards Zero Waste: One Wales - One Planet. (Welsh Government: Cardiff) at 58.

³⁵ Welsh Government (July 2012) *Collections, Infrastructure and Markets Sector Plan* at p.211, para 3.5.4.2.

³⁶ British Standards Institution (January 2011) PAS 100: 2011 Specification for Composted Materials. (BSI: London). Available to download free of charge from the WRAP website: <http://www.wrap.org.uk/> Correct February 12, 2013.

Protocols cannot be complied with, the application to land of the resulting compost or digestate will be classified an “other recovery” process rather than a recycling process.

5.37 Open-Windrow Composting processes only garden wastes in an open air environment or within large covered areas where the green waste can break down in the presence of oxygen. In order to be considered a recycling process, the BSI PAS 100 and the Quality Protocols will apply (however, the Animal By Products Regulations³⁸ do not apply to Open-Windrow Composting due to the feedstock consisting of only ‘green waste’). The resultant compost can be applied to a range of end uses including for gardens, brownfield sites, landscaping and full-scale agriculture.

5.38 Issues which may be relevant for planning consideration depend upon the type of biological treatment facility proposed. Odour, noise and dust will be more significant where the treatment operates outside/in the open air. The potential release of pathogens during decomposition is a consideration for all biological treatment plants, although this is something which may be controlled through conditions within the environmental permit. Site access and vehicular movements, from both HGVs and farm vehicles, requires consideration. Visual amenity is likely to be an issue particularly with proposals coming forward for Open-Windrow Composting. Consideration should also be given to locating AD facilities in proximity to users of heat and also in the broader planning context, to encourage new heat users to locate close to AD facilities which produce biogas for CHP.

Collection Facilities

5.39 The term collection facilities covers waste infrastructure used to collect, sort and transfer various waste streams. It includes bring banks, civic amenity sites/household waste recycling centres, and transfer stations.

5.40 Bring Banks can supplement kerbside collection services, and enhance capture of targeted recyclates at a low additional cost of collection. They can increase a local authorities recycling rate by improving the access to the recycling service by the householder. Sited sympathetically, they can enhance the area in which they are sited and provide alternatives for targeted materials. However if they are not emptied regularly there may be problems of odour.

5.41 Civic Amenity Sites (CAS), if sympathetically located, can reduce the frequency of fly tipping by providing alternatives for targeted materials. However, consideration should be given to noise from vehicles unloading, and the removal of materials from the site once containers are full.

³⁷ Waste and Resources Action Plan and Environment Agency (September 2008) Quality Protocol Compost – The Quality Protocol for the production and use of Quality Compost of Source-Segregated Biodegradable Waste. (WRAP: Banbury). Available online at: <http://www.wrap.org.uk/content/quality-protocols> Correct February 12, 2013.

³⁸ European Union Regulation 1069/2009 laying down health rules as regards animal by-products and derived products not intended for human consumption, OJ L 300 1.

5.42 Transfer Stations are of significant importance to all sectors. They serve to manage the flow of waste more effectively, and reduce overall reliance upon landfill; as increasingly the capture of recyclable materials takes place at these facilities. Sited sympathetically, they can enhance the area in which they are sited and reduce costs to waste carriers by providing alternative markets for targeted bulk materials rather than to deposit small volumes continuously to landfill. Some Transfer Stations may include physical treatment options to optimise their recycling, recovery and the efficiency of onward transport (e.g. sorting of wastes, compaction of mixed loads, shredding of wood wastes etc).

5.43 Transfer stations can create issues with odour, noise, dust, vermin and visual amenity where storage of waste occurs in the open as well as high traffic movements associated with delivering and collecting.

5.44 The required design measures will depend on the type of Transfer Station proposed (i.e. inert, hazardous, or clinical waste). However it will be necessary to ensure these installations are located in suitable areas taking into account the planning considerations set out under Annex C of this document. Planning issues to consider in relation to these types of development include, but are not limited to: suitable highway access for the type and volume of vehicle movements, mitigation of noise and odour and that suitable bunds and impermeable surfacing is provided to ensure that there is no pathway to sensitive receptors such as ground water. The impact on sensitive receptors from potential noise, dust, odour and litter should be considered in siting these facilities.

Specialist Facilities

- Preparation for reuse activities
- Clinical Waste Treatments
- Hazardous Waste Treatments

5.45 Where items are repaired, refurbished and cleaned prior to being used again for their original purpose, these activities fall within the preparing for reuse waste management option of the waste hierarchy.

5.46 Preparation for reuse has many benefits including reducing the ecological and carbon footprints of waste, retaining valuable natural resources within the economy, diverting materials from landfill and may reduce costs to businesses and local authorities. It also affords opportunities for job creation and training. Where practicable, Local Planning Authorities should consider favourably proposals for preparation for reuse and repair infrastructure.

5.47 Issues including odour, litter, vermin and visual amenity are unlikely to be significant for planning consideration due to the types of waste usually undergoing preparation for use and the indoor nature of these activities. Noise may be an issue in relation to the unloading and loading of items which may

TAN 21: WASTE (DRAFT)

be heavy and bulky. Access and space on site should be considered for the purpose of vehicle movements and on-site manoeuvring. Groundwater may be a consideration depending upon the type of waste being repaired and refurbished, for example refurbishment of waste electrical and electronic equipment may pose a risk of harm to controlled waters due to the harmful substances contained in the items.

ANNEX A: rWFD Compliance Matrix

Article	Requirement	TAN 21 Transposition	Reference
1	Requires Member States to introduce measures to protect 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.	Introduces spatial planning policy that reflects the priority order of the waste hierarchy. The Waste Planning Assessment required to be completed by developers of waste installations seeks to ensure that alternative locations and technologies for the management of any wastes are conducted in a way that achieve best overall environmental option.	1.11., 1.16., 1.18., 2.8.5., 2.11., 2.13., 2.14., 4.20., 4.29., Annex B.
4	Establishes a revised hierarchy of waste management options, known as the waste hierarchy.	Planning for waste should be guided first by the waste hierarchy and by the principles of proximity and self-sufficiency.	1.10., 1.11., 1.18., 1.21., 2.7., 2.8., 2.8.1., 2.9., Diagram 2.1., 3.6., 3.7., 4.4-4.6., 4.9., 4.12., 4.18., 4.20., 4.22., 4.23., 5.5., 5.20., Annex B.
11	Requires member states to take reasonable measures to promote the reuse of products and preparation for reuse activities.	TAN21 promotes the prevention of waste through reuse and the extension to lifespan of products. Planning plays a role in waste prevention, reuse and the preparation of reuse activities by supporting proposals for waste treatment, preparation and reuse facilities which aim to divert waste from landfill.	1.13., 1.24., 2.8.1., 2.8.2., 3.7., 3.30., 4.20.
13	Measures should be established to ensure that waste management is carried out without endangering human health, without harming the environment and, in particular: (a) without risk to water, air, soil, plants or animals; (b) without causing a nuisance through noise or odours; (c) without adversely	Annex C – Detailed Planning Considerations. This Annex provides detail on the planning issues which may be relevant to consider in the determination of any planning application for a waste facility. This includes, amongst other things: atmospheric emissions, nature and archaeological conservation, odours and protection of surface and ground water.	1.11., 1.16., 1.18., 2.8.5., 2.11., 2.13., 2.14., 4.20., 4.29., Annex C.

TAN 21: WASTE (DRAFT)

	affecting the countryside or places of special interest.		
16	<p>Member states must establish an integrated and adequate network of waste disposal installations and of installations for the recovery of mixed municipal waste collected from private households, including where such collection also covers such waste from other producers.</p> <p>The network should take into account the principles of self-sufficiency and proximity.</p>	<p>TAN 21 implements Article 16 through its land use planning policies. TAN 21 is one of the documents comprising the waste management plan.</p> <p>TAN 21 sets out the land use policies in relation to the management of all waste and all waste management requirements for Wales. In particular, it provides advice on the siting and need for infrastructure for the management of mixed municipal and residual waste in a period of changing waste composition.</p>	<p>1.11., 1.14., 1.15., 2.9., 2.10-12., 3.3., 3.5-3.8., 3.20., 3.23., 3.24., 4.7., 4.9., 5.16., 5.38.</p>
28	<p>Competent authorities in each member state must establish one or more waste management plans in accordance with articles 1,4,13 and 16.</p>	<p>TAN 21 enables the provision of the sustainable management waste infrastructure network for Wales in line with the rWFD and waste strategy documents.</p>	<p>1.4., 1.14., 2.5., Chapter 3.</p>

ANNEX B: Waste Planning Assessment

Pre-application consultation is essential in terms of establishing the extent of supporting information that is likely to be required (including individual site specific issues) to support a planning application for new waste infrastructure. Undertaking tripartite liaison between applicant, local planning authority, and National Resources Wales to clarify any overlap between Environmental Permitting and material planning considerations will also help to ensure that planning applications are processed efficiently and effectively.

In order to promote pre-application discussion, and ensure sufficient and consistent information is submitted to demonstrate how the proposed waste development will contribute towards meeting Wales' overriding objectives (*TZW, CIM Sector Plan*) for dealing with waste, it will be necessary for applicants to provide a Waste Planning Assessment.

The failure to provide a Waste Planning Assessment may delay the determination of the planning application, and may result in permission being refused on the grounds of a lack of information.

The detail and technical complexity of the Waste Planning Assessment will reflect the scale and potential significance of the proposed development. The Waste Planning Statement could comprise the following information.

Waste Policy Statement

- A description of how the proposals will contribute to the relevant provisions of '*Towards Zero Waste*' and the CIM Sector Plan.
- A statement of compliance with policy related to need & location requirements.
- A calculation of existing and projected future demand.
- Identify the markets that will be served by the proposed development.
- A calculation to identify the current shortfall in treatment capacity.
- A signed declaration that in making the application the applicant has paid due regard to the waste hierarchy (see Box below)

Development

Time-scale

- Lifespan of the operation, including any proposed measures for future proofing
- Days and hours of operation.

Types and quantities of waste to be managed

- The daily capacity for which planning permission is being sought,

- Estimated annual quantity of each waste type to be received, and estimated total capacity where relevant.
- The destination of any end product (residues and any hazardous materials) from the site, should be submitted.
- The minimum and maximum quantities that the facility could process and remain operational.

Design, layout, buildings and plant – a full description of the proposed development including:

- the processes involved
- layout and design of buildings, plant, operational areas, haul roads and external lighting.
- **If relevant - Details on landfill gas and leachate control infrastructure should also be identified.**
- Proposed restoration and aftercare

Amenity and Nuisance

- The compatibility of the proposed development with existing or neighbouring land uses.
- Measures to prevent and control land contamination, light pollution, noise, smell, dust, birds and vermin, litter,
- Any emissions associated with the proposed operations.

Air pollution

- The impact of emissions to atmosphere of any product gasses resulting from specialist treatment/recovery processes.

Energy Efficiency (if relevant)

- Explanation of how energy recovered from the incineration process will be maximised (e.g. through combined heat and power, district heating or the supply of steam / hot water to neighbouring industrial users).
- Evidence that the proposal would or would not meet the R1 energy efficiency calculation.

<p>Declaration</p> <p><i>This statement sets out how the waste hierarchy has been considered in developing the proposals currently forming this planning application.</i></p> <p>Signed.....</p> <p>Date</p>
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ANNEX C: Planning Considerations

There are a number of planning considerations which are relevant to all proposals for waste management facilities. This annex sets out the planning issues which are necessary for applicants and planning authorities to have regard to whilst preparing and determining applications for waste management proposals³⁹.

In accordance with Chapter 3, this annex sets out in more detail the material planning considerations relating to the overarching objectives of:

1. Ensuring prudent use of land and resources.
2. Minimising greenhouse gas emissions.
3. Minimising adverse effects on air quality.
4. To protect & enhance the landscape, townscape & cultural heritage of Wales.
5. Minimising adverse effects on water quality.
6. Avoid increasing the risk of flooding.
7. Protecting biodiversity.
8. Providing employment opportunities & support long-term jobs & skills.
9. Minimising adverse effects on residential property.
10. Minimising the increased cost of waste management.
11. Protecting local amenity.
12. Minimising adverse effects on public health and to avoid increasing health inequalities.
13. Minimising local transport impacts.

1. Atmospheric Emissions

1.1. Air emissions and the potential emission of pathogens and/ or toxins are a material planning consideration and may represent a significant public concern. Such matters are controlled through environmental permitting conditions for facilities permitted under the Environmental Permitting (England and Wales) Regulations 2010, or through other relevant pollution control legislation for facilities exempt from permitting (ie. the 'Statutory Nuisance Provisions' of the Environmental Protection Act 1990). For permitted facilities, the regulator is NRW, with local authorities having responsibility in respect of statutory nuisance issues where these apply. However, air quality issues can be a material planning consideration as well as a pollution control issue.

1.2. Air emissions from waste management facilities will vary according to the operations undertaken at the facility, as an example they can include:

- Particulates – (Thermal Treatments, Gasification, Landfill Gas Plants)
- Bioaerosols – (Composting, Anaerobic Digestion, MBT)
- Acid Gases – (Thermal Treatments, Pyrolysis and Gasification)

³⁹ These planning considerations have been set out in alphabetical order and as such, the order in which they are set out has no relevance to the importance of the considerations.

- Carbon Dioxide – (Thermal Treatments, Gasification, Landfill Gas Plants)
 - Dioxins and furans – (Thermal Treatments, Pyrolysis and Gasification)
 - Heavy metals – (Thermal Treatments, Pyrolysis and Gasification)
- 1.3. Atmospheric emissions relative to all waste management facilities are associated with emissions of combustion products (CO_x, SO_x, NO_x, VOCs and PM₁₀) from Heavy Goods Vehicles (HGVs). These emissions should be considered not only within a close proximity of the site but also along the immediate route of the vehicles involved. However, on a regional basis transfer stations, if correctly located, can reduce the total volume of pollutants produced by reducing the number and mileages of waste vehicles.
- 1.4. Waste management facilities associated with the production of bioaerosols may need careful consideration. (These facilities include In-Vessel and Windrow composting, Mechanical Biological Treatment facilities and certain Landfill operations). Bioaerosols have the potential to travel large distances as they may be carried in the air as spores or microbes, on fine dust particles or entrained on tiny water droplets. However, the weight of the particles and the wind speed and direction dictate the distance to which these may be carried. Environment Agency research suggests that bioaerosols are likely to be at more harmful or equal to natural levels within 250m of waste composting operations. Therefore modelling of bioaerosols and an appropriate separation distance from sensitive receptors may be required. Mitigation measures such as biofilters may reduce these levels.
- 1.5. Landfill gas is comprised of around 40-60% methane, with the remainder comprised of carbon dioxide and trace gases. Landfills which produce landfill gas ('Non-Hazardous Reactive Waste' sites) can be potentially significant contributors to climate change, as landfill gas has a contributory factor around 25 times that of carbon dioxide. Consideration should be given to suitable mitigation methods, such as the combustion of landfill gas during the production of energy outputs. Although these are reliant on the efficiency of landfill gas extraction.
- 1.6. The overall emissions of waste management facilities can be reduced by the co-location of facilities at nodal points, increasing efficiency and maximising Combined Heat and Power opportunities.

2. Birds and Vermin

- 2.1 Waste management sites have the potential to attract birds and vermin, which could constitute as a statutory nuisance. Where waste management operations tend to take place within buildings and/ or waste materials are only present for short periods, processing operations will not normally experience problems associated with rodents or birds.

- 2.2 Waste management sites accepting putrescible wastes have the potential to attract birds and vermin.
- 2.3 Landfill sites can represent sources of flies, vermin and birds which may scavenge food wastes. Fly infestations may occur in hot summer weather conditions when their breeding cycle speeds up. Fly infestations usually derive from sources further up the waste streams such as long bin storage.
- 2.4 Control is provided through permit conditions requiring the control of pests through the application of daily cover (landfills), spraying of waste deposits to eradicate insect pests (landfills), the use of bird-scarers and birds of prey (landfills) and the use of baits and traps (all facilities accepting putrescible wastes). Some landfills are attractive to protected or rare species and require particular care in management.
- 2.5 The numbers and movements of some species of birds may be influenced by the distribution of landfill sites. Congregating birds can become a major nuisance to people living near facilities. They can also become a substantial hazard to aircraft at sites close to aerodromes. As part of the aerodrome safeguarding procedure, local planning authorities are required to consult the Civil Aviation Authority (CAA) on all applications for landfill development that fall within eight miles of major civil aerodromes, and the Ministry of Defence for similar development within 10 miles of military aerodromes. Local planning authorities within such areas should also consult the CAA and Ministry of Defence when preparing their unitary development plans.
- 2.6 When new landfill sites or extensions to existing sites are proposed, then consideration should be given to the potential presence of protected or rare species. However there is the possibility for protected species to be present on other waste management sites and appropriate consideration will need to be given.

3. Dust

- 3.1 Dust from any waste facility has the potential to represent a nuisance issue with potential adverse impacts on residential and/ or local amenity. Dust and particulates can continue to give rise to these issues even out side of operating hours.
- 3.2 Particulate emissions from waste management facilities will depend on the type of facility. Dust production can be minimised through careful design of a facility, use of appropriate and well-maintained abatement equipment, and good industrial housekeeping. Air quality issues will normally be raised at the planning stage and can be a material planning consideration as well as a pollution control issue.
- 3.2 Dust is sometimes generated by vehicles travelling over unsurfaced haul roads and on the public highway leading to and from a site. Vehicle movements on site may also give rise to dust. The loading and

unloading of feedstock from vehicles also has the potential to produce dust, and so suitable mitigation measures may be required.

- 3.3 Dust emissions should be controlled, for instance by dust suppression techniques such as water spraying, by adequate covering of waste storage areas or deposited wastes in landfill sites, by the sheeting of vehicles carrying wastes and by air abatement plant to capture particulates from local exhaust ventilation from in-building facilities, and from combustion activities. It may be appropriate to impose a planning condition that requires waste operators to prepare a scheme, or to indicate what measures will be undertaken, to suppress dust on site. Care should be taken, however, that any planning condition does not duplicate a condition imposed through a waste management licence or Pollution Prevention and Control Permit (PPC).
- 3.4 Locations would need to take into account the potential of local particulate emissions, in order to reduce the impacts on local amenity.

4. Hours of Operation

- 4.1 Local planning authorities will need to consider carefully the proposed operating hours of facilities in order to mitigate impacts of noise, lighting and traffic movements. A condition setting out the hours of working (different hours may be necessary for certain activities) and hours of traffic movement may need to be applied to each waste management facility. If a site is located close to residential or other sensitive land-uses, it would normally be inappropriate to allow operations, deliveries, or other traffic movements to take place at night, during Sundays or on Bank Holidays. However, it should be recognised that certain activities may need to operate at other times. Maintenance of plant, facilities to control or collect gas emissions at landfill sites, or land surface water pumping may require 24-hour operation. At particularly sensitive sites there may need to be more stringent restrictions on hours of operation. Planning and permitting relating to hours of work should be complementary.
- 4.2 A planning condition⁴⁰ limiting overall hours of working may require a shorter operational day for waste disposal to make sure that all operations are completed by the end of the working day. With the depositing of waste in a landfill site, for instance, sufficient time is required for the newly deposited wastes to be covered before operations end for the day.

5. Land Instability

- 5.1 Waste management and disposal sites should not be located where they could be affected by land instability. This might, for instance, damage containment precautions of landfill and landraising sites, or

⁴⁰ GOOD PRACTISE GUIDE FOR WASTE PLANNING CONDITIONS – Planning Officers Society for Wales Minerals & Waste Topic Group - November 2011.

affect buildings at other types of facility. Local planning authorities should satisfy themselves that the stability of proposed sites has been properly investigated and where necessary, an engineering assessment may be required to design appropriate precautionary or remedial measures.

- 5.2 Any new landform, resulting from landfill or landraising operations, should be designed both to be inherently stable and to fit with the nature and scale of existing features in the vicinity. The intended final landform, including gradients and drainage of a site should be designed at the outset, taking account of existing ground conditions, landscaping and pollution control requirements, and options for reclamation and after-use.

6. Lifetime of Waste Management Sites

- 6.1 A planning permission for a waste management facility must in most cases be implemented within 5 years. Longer periods may be appropriate in exceptional circumstances. The impacts of new developments both during and after construction need to be monitored carefully. The local planning authority should be notified when development is to begin.
- 6.2 The duration of a planning permission will relate to the particular waste management proposal. For landfill, all operations, including the final landscaping, should be completed by the end date of the planning permission. It is necessary, therefore, for the waste deposit phase to cease an appropriate period before the permission end date in order to allow the required restoration and aftercare to be completed on time. Predicted end dates may vary, and LPAs may have to exercise flexibility, although public concern about final restoration should be considered carefully.
- 6.3 Landfill operations should be undertaken in accordance with an approved programme of phased operations, in order to minimise environmental disturbance. There are advantages in using planning conditions that give the operator the opportunity to apply to the local planning authority to vary the working programme and other details at a later date if changed site conditions or other new circumstances require. In considering such variations the local planning authority should give prime importance to minimising the overall environmental impacts of the remaining stages of the permitted development, and the consequences for other local land users.
- 6.4 Landfill or land raising operations are essentially transitory although some last for fairly long periods. If other waste management facilities, not necessarily tied to the life of the landfill, are also proposed at such sites the longer-term environmental benefits and disbenefits of the whole or co-development should be considered. It will be necessary in some instances to consider the intended closure of the parent

operation, and judge whether it is appropriate to limit the period of operation of the ancillary development. This decision should be taken in the context of the updated annual monitoring report on landfill need and TZW which seeks to limit reliance on landfill.

- 6.5 Local planning authorities and operators should discuss the need for amendments to existing planning permissions to anticipate and make provision for changes in landfill categorisation and changes in the volume and nature of the waste streams available to landfill that could affect site restoration. For sites with a long remaining life, in excess of 5 years, it may be necessary to assess the viability of the operations continuing and consider alternative means of restoration, in consultation with NRW.

7. Litter

- 7.1 Litter can be a serious problem on waste management sites, especially landfills, transfer stations and civic amenity sites. Operators should ensure that their site operating procedures tackle this problem in a reliable and consistent way, by ensuring, for example, that working areas are covered and that litter screens are erected and maintained. Even small-scale facilities such as container banks can give rise to litter through overflowing if not emptied frequently enough. Vehicles bringing material to sites and waiting to discharge should be appropriately netted or sheeted.

8. Nature and Archaeological Conservation

- 8.1 Landfilling may be proposed in former mineral workings that have been abandoned for some time, and where natural regeneration of habitats has been taking place. It is for local planning authorities (in consultation with the NRW) to consider whether landfilling would be appropriate in these circumstances, having regard to the nature conservation value of the site. This recommends that all areas of damaged land, including former mineral workings, should be assessed for their nature conservation interest. Where any ecological interest is known or is suspected to be significant on or adjacent to proposed development sites, an ecological / geological / soil survey should be undertaken before any decision is taken on the future use of the site.
- 8.2 Facilities should not be located in, or sufficiently near that they would have an adverse impact on areas or sites designated for local, national or international protection, such as:
- World Heritage sites;
 - AONB;
 - National Parks;
 - National Nature Reserves;
 - SINC;
 - SSSIs;

- SACs;
- SPAs; or
- RAMSAR; sites

8.3 Account should also be taken of the potential effect on sites of archaeological importance.

9. Noise

9.1 As part of the planning process, consideration of the impact of proposed waste facilities on residential development and other noise sensitive receptors will need to be considered.

9.2 The level of detail supplied in the application should be commensurate with the level of risk. In other words, the higher the risk of causing annoyance or other environmental impact, the more detail is required and the higher the expectation of a proactive approach to noise control.

9.4 Noise assessments should be undertaken in accordance with BS4142:1997 (*Method for rating industrial noise affecting mixed residential and industrial areas*) and BS5228-2:2009 (*Code of practice for noise and vibration control on construction and open sites*) as appropriate, or any future replacement guidance.

9.5 Where required, noise control measures should form a scheme developed by the site operator in conjunction with the Planning Authority and the appropriate regulator (NRW in respect of permitted facilities, and the local authority for other waste management operations). The aim should be to control noise impact by setting noise limits at sensitive receptors. This is more appropriate than setting noise limits at site boundaries or prescribing minimum distances between sites and noise sensitive properties. In order to achieve these noise limits, consideration should be given to mitigation measures such as noise bunds and fences to contain noise disturbances.

10. Odours

10.1 Waste management facilities can produce odours that can be a cause of concern to sensitive receptors, and this should be given full weight in the consideration of planning applications. Odours may be controlled both by planning and site permitting conditions under the Environmental Permitting (England and Wales) Regulations 2010 administered by NRW. Local Authority Environmental Health Departments may also become involved in enforcement if a statutory nuisance arises in respect of facilities which are exempt from permitting.

- 10.2 Among the facilities presenting the greatest potential for odour production are those which compost food and green wastes, sites which transfer or treat mixed wastes (such as Mechanical Biological Treatment facilities) and Non-Hazardous Reactive Waste landfill sites. These types of facility have historically led to the most public complaints. Odour issues have been a cause for site closures. In particular, landfill sites can give rise to public concern as their odours can be detectable from over 1km away from a site. Over half of all landfill complaints relate to odour. However, most odour problems may be overcome with good site and landfill gas management procedures.
- 10.3 The majority of small facilities such as container banks should not generally present a problem although they should be emptied and cleaned frequently.
- 10.4 Odour can be minimised by using techniques such as negative pressure in facility housings, and good site practices, such as the daily covering of waste at landfill sites. Odour mitigation measures could have potential visual impacts and so should be considered as part of planning processes, and where possible, as part of the original proposal.
- 10.5 Where a proposed development is considered “EIA development under the Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999 (as amended) the impact of odours may be carried out as part of the formal Environmental Statement (ES) required to identify, assess and mitigate against potential significant environmental effects.
- 10.6 For major infrastructure consented under the Planning Act 2008, the impact of odours again may form a key part of an assessment required under the Infrastructure Planning (Environmental Impact Assessment) Regulations 2009. The Local Planning Authority will play a key role during the consultation process and through the requirement under section 60 of the Act to produce a Local Impact Report.
- 10.7 Careful consideration needs to be given when locating new developments, such as residential developments, schools and hospitals, which may be sensitive to the activities of neighbouring waste management facilities (i.e. odour and noise). If inappropriately located, the development may lead to the waste management site becoming the subject of complaint from the new occupiers.
- 10.8 NRW should advise the local planning authority on the pollution control provisions and specify those issues that the licence or permit will deal with to avoid duplication of controls.

11. Protection of Surface and Groundwater

- 11.1 Potential effects on water resources are a material planning consideration. There should be no possibility of run-off, spillage or leachate pollution of surface or groundwaters.
- 11.2 For landfill and landraising applications, planning conditions² will be required to control drainage and disposal of surface water and to prevent pollution of groundwater by leachate. Proposed sites for landfill or landraising should be investigated carefully by developers (in consultation with NRW) to determine the geological and ground conditions as well as the behaviour of surface and groundwaters.
- 11.3 Other forms of waste management facility may also have the potential to affect groundwater through the seepage of pollutants. However, as most facilities are undercover and on concrete hard standing with separate foul water drainage, rainfall is unlikely to come into contact with the waste materials, and as such, water pollution is unlikely. However, any wash-down waters and any liquid within the waste does need to be managed appropriately.
- 11.4 Waste management facilities with any potential to contaminate soils or groundwater should be located on preferred sites with natural geological advantages, such as clay deposits and sites which are inherently seismological and geologically stable.
- 11.5 Permit controls may require the use of bunding or closed drainage systems to prevent contaminants entering normal surface water drainage. Most facilities will require drainage systems to ensure that dirty waters are dealt with appropriately and separately from surface water drainage.

12. Flood Risk

- 12.1 Waste management facilities proposed in areas without existing flood defence infrastructure that are regularly or potentially subject to flooding are unlikely to be acceptable. In areas that may be subject to flooding, the potential effects on floodwater should be taken into account. NRW and Technical Advice Note (TAN) 15 provide further advice on this and the potential generation of additional surface water run-off.
- 12.2 Proposed sites for landfill or landraising should be investigated carefully by developers (in consultation with NRW) to determine the geological and ground conditions as well as the behaviour of surface and groundwaters. Landfill activities may disrupt surface and groundwater flows by altering local topography, excavating below groundwater levels and via dewatering operations.

13. Reinstatement of the site

- 13.1 When the operation of a waste management site comes to an end there needs to be an obligation for it to be left in a fit state for beneficial subsequent use. The restoration of the site should have clear regard to the end use. If the proposed after-use constitutes a material change in land use, planning permission will be required. Permit conditions and sound management should ensure that there is no possibility of future harm or pollution.
- 13.2 In the case of landfill and landraising operations, appropriate and careful restoration and aftercare is required to prepare the site for a use which is compatible with the surrounding area and the provisions of the local development plan (LDP).

14. Transport and Access

- 14.1 Waste management facilities have the potential to generate a large increase of vehicle movements within the locality. Vehicular movements, transport and access are material planning considerations. The traffic generated may include a mixture of private vehicles, waste collection vehicles, bulk haulage vehicles and skip transporters.
- 14.2 The principal material planning considerations relating to transport and access are:
- Congestion;
 - Severance;
 - Safety and traffic related loss of amenity;
 - Mud on roads; and
 - Traffic associated air pollution; if development affects trunk routes, then it may also become a concern of the Highways Authority.
- 14.3 The economic viability of certain facilities will rely on volume and throughput. This will inevitably impact upon the nature and volume of vehicle movements and the nature and source of the waste. Vehicle movements in and out of such facilities should be considered carefully by local planning authorities, as any major waste facility will be served by a significant number of HGVs.
- 14.4 Small scale facilities are unlikely to have a significant effect on local traffic flows. However, these facilities may form additional processing operations to avoid the disposal of waste, increasing the number of movements in the locality compared with direct transport to incineration or landfill.
- 14.5 Local planning authorities should consider routes and volume of traffic associated with increased activities at existing facilities, as well as the traffic implications at proposed facilities. The ideal scenario, where other planning considerations allow, would be the location of facilities at nodal points that are easily accessible from major transport routes,

(potentially reducing the need for transfers between sites) reducing the impact of traffic on the road and rail networks.

- 14.6 Co-location of these types of activity with other waste management practices would be advantageous, minimising the overall distance travelled by vehicles. However, centralised facilities would generate significant levels of HGV movements. Therefore it may be necessary to place restrictions on deliveries to centralised facilities.
- 14.7 Planning preference should be given to sites within close proximity to alternative modes of transport. Planning permission should be refused if the existing road network is unsuitable, or the impact of traffic on local communities is unacceptable, and cannot be improved sufficiently as part of the proposed development. Improvements may be achieved through a highway agreement, by means of a planning obligation via a unilateral undertaking, Community Infrastructure Levy (CIL) Regulations or by an agreement under Section 106 of the Town and Country Planning Act 1990.
- 14.8 As with all waste management facilities, bring banks and civic amenity sites will be accessed by a significant level of traffic, potentially causing an impact on roads close by and the amenity of local residents. The majority of this traffic will consist of private vehicles, although waste collection vehicles such as HGVs and skip transporters will also need to visit the site on a regular basis. Potential for traffic queuing at peak times is a major issue, and so proposals for facilities should have good highway and pedestrian access to minimise congestion and reduce the risk of accidents.
- 14.9 Most waste facilities have specific spatial requirements, for example an appropriate size, layout, and level service area for parking, unloading and turning of large vehicles with minimal reversing and a parking area for staff and visitors. Sites should be of a sufficient size for the circulation and manoeuvring of traffic within the site.
- 14.10 The traffic noise generated in association with waste management facilities is a material planning consideration. Noise issues may arise due to general traffic noise onsite or on the local road network, waste collection vehicle manoeuvring (particularly in relation to reversing alarms) loading and unloading operations associated with HGV movements and/ or train noise.
- 14.11 Vehicle movements on un-surfaced haul roads and on the public highway leading to and from a site may give rise to dust, creating a nuisance issue with adverse impacts on residential amenity. Planning

authorities should take this into consideration when determining an application.

- 14.12 A planning condition requiring that adequate cleansing facilities are provided, so that vehicles moving off sites will be clean, should normally be sufficient to ensure that mud and waste materials are not deposited on the highway.
- 14.13 Vehicle movements may also result in a negative visual impact. The significance of any such impact is dependent on the number of vehicles/ trains/ barges accessing and exiting the site.
- 14.14 HGV movements in relation to waste management facilities can contribute towards atmospheric emissions, and are primarily associated with emissions of combustion products (CO_x, SO_x, NO_x, VOCs and PM₁₀). These emissions may be important within close proximity to sites as well as along the immediate route of the vehicles involved.
- 14.15 Where there is reason to believe that the numbers of vehicle movements to and from a site will have significant adverse effects on residential property along access routes, it may be appropriate to set a limit on the quantity of material that may be transported, or the number of movements to be permitted over specified periods. Ideally, such a condition will be self-policed by the operator, for example through keeping suitable weigh-bridge records, but planning conditions may be imposed to require summaries of vehicle movements to be submitted periodically to the local planning authority for monitoring purposes. There may also be a requirement for open-topped vehicles to be sheeted, amongst other restrictions common to most waste transport.

15. Visual impact

- 15.1 The development of any new building may lead to impacts on landscape character and visual amenity. Landscape and visual impacts are material planning considerations. A significant amount of public concern and anxiety can be generated by the proposed visual appearance of such waste management facilities⁴¹. The site should take advantage of existing topography so as to reduce the visual impact and the facilities should not be located where they will have an adverse impact upon statutorily protected landscapes.

Waste management facilities, their operations and the traffic associated with them vary greatly in size and degree of their visual

⁴¹ See the case studies in Waste Planning: Practice Guidance.

intrusion. Consideration should be given to the potential effects on the landscape.

- 15.2 Larger scale plants have the potential to create greater visual intrusion. Enclosed facilities will also require buildings and/ or containers for the waste reception processing areas. Smaller, less conspicuous installations may be more appropriate in some circumstances, subject to the economic viability of the operation. Sites may be screened by landscaping works and amenity bunds as well as advance planting of trees, shrubs or hedges around the periphery of a site.
- 15.3 The significance of any landscape and visual impact is dependent upon a number of site specific issues such as:
- Compound footprint;
 - Direct effects on landscape fabric, including Greenfield vs. Brownfield, removal of hedgerows, trees etc;
 - Proximity of landscape designation;
 - Site setting, for e.g. the proximity of list buildings and/ or conservation areas;
 - Proximity of sensitive viewpoints;
 - Stack height/ number of stacks;
 - Presence of existing large built structures;
 - Existing landform and nature of existing landscape;
 - Presence/ absence of screening features (trees, hedges etc.)

Traffic movements may also result in a visual impact and should also be taken into consideration.

- 15.4 The site planning for a large waste management facility should include details of landscape proposals and planting where this is required to reduce visual impact. A landscaping scheme will usually be required as part of a planning application.
- 15.5 The height of the stack used for release of gaseous emissions can be a critical concern to local residents and represent a major visual impact. The frequency of a visible plume from the stack also needs to be considered. The presence of flares/ engines and their associated stacks can add a new 'industrial' feature into a generally open context of a restored landfill. Stack height will determine the degree of visibility of the compound to a significant extent, and in the future, as emission criteria become more stringent, taller stacks are likely to be required. However, landfilling activities are often utilised to reprofile and landscape derelict land or mineral voids leading to landscape improvement in the long term.
- 15.6 New lines or cables used to connect energy producing facilities to the National Grid for electricity transfer will also have an impact on visual amenity both on and off the site.

- 15.7 Careful site selection and appropriate orientation of the appearance of the building footprint together with appropriate screening measures can help to minimise any potential adverse impacts, and consideration should also be given to the opportunity for site profiling and engineering to minimise the visual appearance of building. In some instances partial burial of certain elements of the plant may be possible.
- 15.8 A degree of design modification should be possible to ensure the building provides a good fit with the local architectural vernacular, and has colour treatment and design details that are consistent with local industrial design guides. Various site engineering and screening techniques can be used to minimise visual impacts if located in a particularly sensitive setting.

16. Planning conditions

- 16.1 Where planning permission is given for waste management, local planning authorities should consider imposing conditions or negotiating obligations, where relevant appropriate, in respect of matters such as:
- Transport modes, mode transfer facilities, access arrangements, and the volume of traffic generated;
 - The physical nature of wastes acceptable or excluded, insofar as this might affect local amenity or neighbouring land-use (but not to the level of detail relevant to a waste management licence or PPC permit);
 - The hours of operation where these may have an impact on neighbouring land-use;
 - Noise limits;
 - The timescale of operations and any phasing of uses on a site;
 - The protection of surface and underground water;
 - Plant and buildings;
 - Ancillary development;
 - Visual impact – screening and lighting proposals;
 - Landscaping;
 - Minimising nuisance from dust, birds, vermin or litter;
 - The historic environment, industrial heritage and archaeological remains;
 - Precautionary measures against the risks of sites suffering from or causing land instability;
 - Removal, handling and preservation of topsoil and subsoil, and their replacement at the restoration stage;
 - The area to be filled and site layout; and,
 - Restoration and aftercare - including pre/post settlement contours at landfill or landraising sites. (Details may need to be reserved until a site is close to its completion, or amended to reflect changing needs for mitigating the impacts on the environment and local communities).

- 16.2 Applications for incinerators that would generate more than 50MW output of electricity would require authorisation from the National Infrastructure Planning Unit of the Planning Inspectorate.

ANNEX D: Glossary of Terms

Term	Definition
Agricultural Waste	<p>Waste from premises used for agriculture or horticulture within the meaning of the Agriculture Act 1947 that the holder discards, intends to discard or is required to discard. Examples include: used tyres, surplus milk, used pesticide containers and old silage wrap.</p> <p>Agricultural waste is controlled in the same way as industrial waste, although it is important to note that</p>

TAN 21: WASTE (DRAFT)

	<p>manure is not classified as waste if it is being used as fertiliser on the farm on which it arises. The Waste Management (England and Wales) Regulations 2006, SI 2006 No.937 amended s.75(7)(c) of the Environmental Protection Act 1990 to bring agricultural and mining/quarry waste within the scope of "controlled waste". This has had the effect of bringing agricultural waste within the same national management controls already in place to comply with the rWFD. Agricultural operations fall under the Environmental Permitting (England and Wales) Regulations 2010.</p>
Anaerobic Digestion (AD)	<p>A biological process where biodegradable wastes, such as kitchen or food waste, are encouraged to break down in the absence of oxygen in an enclosed vessel. It produces carbon dioxide, methane (which can be used as a fuel to generate renewable energy) and solids/liquors known as digestate which can be used as fertiliser.</p> <p>This form of waste treatment has an advantage over composting, since it generates energy, which reduces emissions of climate change gases by offsetting emissions from fossil fuelled power stations. It gives higher net carbon savings than composting.</p>
Bioaerosols	<p>These are naturally occurring bacteria and chemicals found in the air and produced when organic matter, particularly compost decomposes.</p> <p>Bioaerosols are material considerations in locations where sites treating or disposing of organic wastes must be sited at least 250 metres from dwellings and/or businesses.</p>
Biodegradable / Putrescible Wastes	<p>Biodegradable / Putrescible waste includes paper and card, food and garden waste, and a proportion of other wastes such as textiles.</p>
Bring Sites / Collection Banks	<p>A recycling point where the public can bring material for recycling, for example bottle and can banks. They are generally located at supermarket car parks, council car parks and similar locations.</p>
Civic Amenity Site	<p>Site provided by the Local authority for the disposal and recycling of household waste including bulky items free of charge.</p>

TAN 21: WASTE (DRAFT)

Closed Loop Recycling	Recycling where recycled materials are being used for the same or similar purpose, e.g, a glass bottle recycled into new glass product rather than downgraded, for example being used as an aggregate.
Combined Heat and Power (CHP)	A highly fuel efficient technology which produces electricity and heat from a single facility.
Composting	An aerobic, biological process in which biowastes, such as garden and kitchen waste, are converted into a stable granular material which can be applied to land to improve soil structure and enrich the nutrient content of the soil.
Controlled waste	Defined in s.75(4) Environment Protection Act 1990 as household, industrial and commercial waste (this includes agricultural and mining wastes) or any such waste
Cool User	<p>Is a user of cool energy produced as part of a trigeneration or quadgeneration recovery activity. Operations using the cool energy from such activities may include those requiring air conditioning or refrigeration. As with efficient combined heat and power users, cool users should be sited in proximity to the source to maximise efficiency.</p> <p>See for example, the Olympic Park Energy Centre in London which is a trigeneration plant. The biomass fired boilers generate heat and cold, reducing the park's carbon emissions by 20-25% (Department of Energy and Climate Change, 2012).</p>
Courtauld Commitment 1 & 2	Voluntary agreement aimed at improving resource efficiency and reducing carbon and wider environmental impacts of the grocery retail sector. Now in Phase 2, it aims to achieve more sustainable use of resources over the entire lifecycle of products and throughout the whole supply chain.
Digestate	The fraction remaining after the treatment of segregated organic wastes through anaerobic digestion. It is a mainly liquid material, with an average solid content of between 5-20%. Digestate produced in accordance with the standard BSI PAS110 and the developing Environment Agency Quality Protocol for Anaerobic Digestate can be used for appropriate agricultural and horticultural applications as a product, and is no longer considered to be a waste material.

TAN 21: WASTE (DRAFT)

Feedstock	Raw material required for a process.
Gasification	Gasification is the process whereby carbon based wastes are heated in the presence of air or steam to produce fuel-rich gases.
Household waste	Includes waste from household collection rounds (waste within Schedule 1 of the Controlled Waste Regulations 1992), waste from services such as street sweeping, bulky waste collection, hazardous household waste collection, litter collections, household clinical waste collection and separate garden waste collection (waste within Schedule 2 of the Controlled Waste Regulations 1992), waste from civic amenity sites and wastes separately collected for recycling or composting through bring/drop off schemes, kerbside schemes and at civic amenity sites.
Household Waste Recycling Centre (HWRC)	Site provided by the Local authority for the disposal and recycling of household waste including bulky items free of charge.
In Vessel Composting (IVC)	This is a process where biowaste is placed in sealed containers and aerobically treated (usually with the forced addition of air) to ensure the breakdown of organic wastes over a set time and at a set temperature to a given standard (PAS110).
Landfill / Landraising Sites	Any areas of land in which waste is deposited. Landfill sites are often located in disused mines or quarries. In areas where they are limited or no ready-made voids exist, the practice of land raising is sometimes carried out, where waste is deposited above ground and the landscape is contoured.
Landfill Gas Utilisation Plant	A facility which converts landfill gas to energy. Comprised of one or more landfill gas engines with supplementary landfill gas flare, usually in an enclosed compound.
Leachate	Leachate is the generic term given to water which has come into contact with waste materials and which has drawn pollutants out of those materials into solution, thereby contaminating the water.
Leachate Treatment	Leachate treatment is a process to reduce the polluting potential of leachate.
Legacy Waste	Legacy wastes are often hazardous, for example asbestos, are materials that it is not currently feasible to recover or recycle and therefore cannot be returned into the chain of utility. The only option is disposal, and this is likely to continue to be the case in the future if that material continues to be used in the present way. In order for waste not to become legacy waste the original product needs to

TAN 21: WASTE (DRAFT)

	<p>be redesigned so that it can be recovered and reused. In the meantime, new treatment methodologies need to be developed wherever possible to avoid these materials being sent for disposal.</p>
Local Authority Collected Municipal Waste	<p>Local Authority Collected Municipal Waste is municipal waste as collected by local authorities. It includes household waste and any other wastes collected by a Waste Collection Authority (WCA), or its agents, such as municipal parks and gardens waste, beach cleansing waste, commercial or industrial waste and waste resulting from the clearance of fly-tipped materials. WCA - A Local authority charged with the collection of waste from each household in its area on a regular basis. They can also collect, if requested, commercial and industrial wastes from the private sector.</p>
Materials Recovery Facility (MRF)	<p>A specialized plant that receives, separates and prepares waste materials into different component streams prior to onward transfer to a reprocessing plant, disposal or treatment facility (end-user manufacturers).</p> <p><i>Dirty MRF</i> where some recyclable components are separated from mixed, unsorted waste</p> <p><i>Clean MRF</i> Clean, dry, pre-sorted or partially sorted materials are bulked up prior to onward transfer to a reprocessing plant.</p>
Mechanical Biological Treatment (MBT)	<p>combines biological and physical processes in the management and treatment of residual waste. Waste undergoes a mechanical sorting process to separate out recyclables. The remaining waste following this first phase processing is the organic rich fraction or biodegradable fraction for biological treatment. The second phase is a biological digestion process (aerobic decomposition and/or anaerobic digestion). Where AD is used to digest organic rich waste fraction, biogas is produced which can then be used as a source of energy.</p>
Mixed Waste Processing	<p>Mixed waste processing is designated to recover valuable components from unsorted municipal solid waste for recycling and deliver a stabilised residue for final landfilling. Otherwise processing involves a</p>

TAN 21: WASTE (DRAFT)

	number of standard waste separation techniques to remove recyclable materials such as glass, metals and plastics, followed by the composting or anaerobic digestion of the remaining organic materials.
Municipal Waste	Municipal waste means 'municipal waste as collected by local authorities'. It includes household waste and any other wastes collected by a Waste Collection Authority (WCA), or its agents, such as municipal parks and gardens waste, beach cleansing waste, commercial or industrial waste and waste resulting from the clearance of flytipped materials. WCA - A Local authority charged with the collection of waste from each household in its area on a regular basis. They can also collect, if requested, commercial and industrial wastes from the private sector.
Open Loop Recycling	Where the end product of recycling is used to replace something else, e.g. glass is recycled into aggregate which replaces virgin aggregate.
Plastics Recovery Facility (PRF)	Sorts plastics into different fractions for recycling
Processor	An operator who accepts the waste, processes it in some way e.g, segregation, baling shredding, bulking etc before sending the material onto a reprocessor. Processors often form the first destination of a waste material from a local authority, particularly with respect to metals, mixed paper and card and plastic wastes. There can be several intermediaries (i.e. processors, brokers etc) between collections and the final reprocessing of the material.
Pyrolysis	During pyrolysis, organic waste is heated in the absence or air to produce a mixture of gaseous and liquid fuels and a solid inert residue (mainly carbon).
Recyclate	This is material separated (either at source or following interim treatment) for the purpose of recycling.
Recycling	This means any recovery operation by which waste materials are reprocessed into products, materials or substances whether for the original or other purposes. It includes the reprocessing of organic material but does not include energy recovery and the reprocessing into materials that are to be used as fuels or for backfilling operations
Reprocessor	An operator undertaking one or more activities of recovery or recycling.

TAN 21: WASTE (DRAFT)

Residual Waste	The term used for waste that remains after recycling or composting material has been removed from the waste stream.
Special Waste	This term has been replaced with “Hazardous Wastes” under the Hazardous Waste (England and Wales) Regulations 2005 (as amended).
Thermoplastics	Polymer resins. This type of plastic is liquid when heated and hard when cooled. It can be reheated, reshaped and is easy to recycle.
Thermoset	These are rigid plastics which are resistant to high temperatures than thermoplastics. Thermoset plastics cannot be remolded once set.
Transfer Station	Facilities which receive waste for bulking into larger containers prior to onward transport to a point of treatment, disposal or reprocessing
Treatment	Physical, thermal, chemical or biological processes, including sorting, that change the characteristics of the waste in order to reduce its volume or hazardous nature, facilitate its handling or enhance recovery.
Upcycling	Where high energy raw materials are substituted by lower energy secondary raw materials and these are retained in the materials economy. It often refers to the reconfiguration of waste materials and items into desirable new items.
Waste Management Network	<p>Wales has a duty to take measures to establish an integrated and adequate network of waste disposal installations and installations for the recovery of mixed municipal waste collected from private households and similar wastes from other sources.</p> <p>The waste management network is wider than just disposal and recovery infrastructure. To manage waste efficiently a joined up network of collection, transport, transfer, storage, interim and final processing infrastructure is needed. This infrastructure should be sufficient for the volume of waste arising taking into account spatial and demographic factors and therefore, the wider waste management network may take into account infrastructure not only available in Wales but cross border and even within the European Union.</p>
Windrow Composting	Where waste is heaped up, either in the open air or in buildings and periodically turned to help the

composting process. This is not suitable for kitchen waste which requires a treatment to kill harmful organisms in animal by-products and food.