

## Biowaste (Green)

1.1 This paper summarises the biowaste (green) opportunities in Hampshire required to meet the Vision of the MRS. The waste stream overlaps with waste streams covered by other papers on **paper and card** (facilitating composting of green waste, paper portal waste from mills), **wood** (oversized tree cuttings shredding at composting sites to produce wood chippings), **agricultural waste**, and the other **biowaste papers** (food waste and wastewater).

1.2 **The main opportunities to meet the MRS Vision**

1.3 **Locally:**

1.4 MRS partners and industry should help to actively support home composting (focused especially within rural areas) and community composting schemes (focused especially within urban areas) through Project Integra composting. MRS partners and the waste operators should promote green wastes, its potential uses and green credentials, the benefits to householders, allotment associations, farmers and other interested groups along with best practice guidance.

1.5 The MRS partners should support the implementation and development of infrastructure to encourage the recycling of trade green waste as required. New facilities will need to be provided, or existing facilities need to be developed to be able to take trade wastes.

1.6 The MRS partners should amend try to use the public procurement of composted material produced from green waste, to create stable markets for the product.

1.7 **Nationally:**

1.8 MRS partners should lobby the Government to introduce a tax incentive to make green waste composting more financially attractive. This could be achieved through tax breaks for composted products making it cheaper than non – recycled products. MRS partners should lobby the Government to introduce a peat levy within the aggregates tax

1.9 **European:**

1.10 The MRS partners and government should support the development of the European Union's quality requirements which would be an essential element to the establishment of a healthy market for compost.

## Current green waste resources situation in Hampshire

2.0 Green waste consists of horticultural waste such as garden waste collected directly or from Household Waste Recycling Centres (HWRCs), local authority leaf collections, and waste from landscaping companies. It also includes unprocessed food wastes such as watercress and salads, as well as cut flowers and similar.

2.1 Green waste is generated from household, commercial and agricultural sources. Currently around 60,000 tonnes per annum is collected at HWRCs or through kerbside green waste collection schemes. Although there are thought to be significant quantities of trade green waste which need to be considered, the available data is poor. Currently around 70,000 tonnes per annum are delivered to composting sites in Hampshire (Onyx,2004) The estimated quantities of green waste arisings in Hampshire are summarised in table 1. The first column shows potential arisings (for example unseparated green wastes that could potentially be separated), and the second column shows the actual arisings.

2.2 Accurate data on the potential green waste arisings is not available and has to be estimated from other data. The 1999 household waste compositional study (Hampshire County Council,1999) found the 14.39% of kerbside collected household waste was green garden waste. Total kerbside household waste arisings for the same year were 570,817 tonnes and so an estimated figure of around 82,000 tonnes can be calculated.

2.3 It is not possible to make an estimate of the likely potential green waste arising in the commercial waste stream, although the quantities are known to be significant (stakeholder workshop,2004).

**Table 1 Actual and potential separated green waste arisings suitable for windrow composting in Hampshire, Portsmouth and Southampton**

	<b>2002/03 potential (tonnes)</b>	<b>2002/03 actual (tonnes)</b>
Green waste arisings at HWRCs and bring sites	61 000	61 184
Potential green arisings from general household waste stream <sup>1</sup>	82 000 <sup>1</sup>	0
Green trade waste arisings (e.g. landscapers, Vitacress)	unknown	10 000*
Unseparated green (supermarket cut flowers etc) which could potentially be separated	unknown	0*
<b>TOTAL</b>	<b>&gt;143 000</b>	<b>71 184</b>

(Source: Entec,2004 (except as stated below))

<sup>1</sup> calculated from total household waste arisings on the basis that 14.39% of the kerbside collected household waste is green garden waste.  
(\*Source: Estimate, stakeholder working group,2004)

### **Current Legislation**

- EU Landfill Directive
- Animal By products Order
- Landfill (England & Wales) Regulations 2002
- Groundwater Regulations 1998
- Environmental Protection Act
- Nitrate Vulnerable Zones (England and Wales) Regulations
- Agricultural Waste Regulations
- Waste Management Licensing (Environment Agency)

## **Existing recovery routes and infrastructure in Hampshire**

### **3.0 Current Resource Management**

3.1 Composting is a biological process in which micro-organisms convert degradable organic matter into compost producing carbon dioxide and water vapour. In March 2004, all green waste in Hampshire is composted in the open air using windrow techniques or similar variants. Windrow composting involves piling the shredded green waste and then turning it on regular basis to ensure that the windrow remains aerobic, facilitating the composting process.



Composting at Herriard.

3.2 There are currently 11 windrow composting sites for green waste in Hampshire (Hampshire County Council,2003). These consist of medium and large scale facilities with throughput and operations regulated by a Waste Management Licence, and small “on-farm” composting sites which are exempt from Licensing. On-farm sites are currently allowed to store a maximum of 1000m<sup>3</sup> of green waste on the site at any one time. This equates to a maximum annual capacity of about 3500 tonnes. Table 2 shows the current annual throughputs and the potential green waste composting capacity for green waste in the County. The current throughputs of the on farm sites have been estimated. The estimates are based on knowledge of the throughputs for the three Hampshire Waste Services sites, and the total arisings of green household waste in the County. Volumes of trade waste have been assumed to be equal to volumes of household waste, and the total volume has been divided equally between all the on-farm sites.

**Table 2 – Green waste composing sites in Hampshire (2003)**

Site (District)	Operator	Waste Management Licence and waste sources	Annual throughput (tpa)	Max Capacity (tpa)
<b>Little Bushy Warren</b> , Herriard	Hampshire Waste Services	Licensed (household/trade)	18,000	75,000
<b>Chilbolton Down</b> , Leckford	Hampshire Waste Services	Licensed (household/trade)	25,000	25,000
<b>Down End Quarry</b> , Fareham	Hampshire Waste Services	Licensed (household/trade)	20,000	20,000
<b>Blackmoor Estate</b> , Blackmoor	Williams & Blackmoor Est'	Exempt (household/trade)	1 750x	3,500*
<b>Manor Farm</b> , Hayling Island	Fieldfare UK	Exempt (household/trade)	1 750x	3,500*
<b>+Thorns Farm</b> , Lymington	T J Composting	Exempt (household)	1 750x	3,500*
<b>Broughton Down Farm</b> , Broughton	A W Jepson Turner	Exempt (trade)	1 750x	3,500*
<b>The Pebbles</b> , Boarhunt	K Butler	Exempt (Trade)	1 750x	3,500*
<b>+Down Farm</b> , Odiham	G K Benford	Exempt (Trade)	1 750x	3,500*
<b>Frigo Farm</b> , Longparish	?	Exempt (household)	1 750x	3,500*
<b>Rockbourne</b> , Fordingbridge	?	Exempt (household/trade)	1750x	3,500*
<b>Totals</b>			<b>77 000</b>	<b>148 000</b>

(Source: Hampshire County Council,2003 )

(\* approximate figures)

(x estimated figures)

3.3 Current collection systems for green waste vary across the county according to district. Many rely on householders taking green waste to a HWRC, however, a number of districts have implemented or plan to implement kerbside collection schemes for green wastes (See Appendix 1). Significant quantities of green waste are also known to be disposed with general household refuse (Entec,2004).

3.4 Some sites in Hampshire can accept limited quantities of trade waste but the lack of data available on commercial and trade green wastes makes it difficult to assess disposal routes. However, it is likely that the majority of this is landfilled (either separated or mixed with other wastes), with much smaller quantities burnt or fly-tipped. Green wastes are thought to be landfilled due to the effort needed to keep green wastes separate from general waste, combined with a lack of awareness of possible cost saving from alternatives.

### 3.5 Social Issues

3.6 Project Integra ran a Home Composting Scheme in 2003 called 'Don't waste it, Compost it'. This campaign involved distribution and promotion of special offer Home Composting kits. Schemes and initiatives such as this should be actively monitored and should be promoted if viable in the future.



3.7 There are currently a few examples of community composting schemes in Hampshire. These include schemes run by Testway Housing, BTCV, the Countryside Education Trust, Show Trust Agriculture, Friends of the Earth and the Brook Meadow Conservation Group. The best practice on community composting schemes should be promoted to relevant groups. The future feasibility of introducing such schemes in certain areas should be assessed

3.8 The Composting Association runs annual UK wide campaign to encourage people to make and use soil enriching composts. It is currently in its 4<sup>th</sup> year and special events are set up to promote the benefits of making and using composts to their communities. Compost Awareness Week (UK) is part of an International initiative as a means to promote composting and compost use throughout the country. The Composting Association has also developed schemes involving celebrities such as Alan Titchmarsh to highlight the benefits of home composting through a Home Composting Guide.

3.9 Composting schemes suffer from negative public perceptions, which can cause problems and delays in obtaining planning permission for new composting facilities. More effort needs to be made to tackle these negative perceptions. Councillors and the public need more experience of the composting process and its impacts to counter the negative perceptions. This could be achieved through an "open-sites" policy that allows interested people to visit and experience the process first hand.

### 3.9 Environmental Issues

3.10 Compost produced from green waste provides an environmentally friendly alternative or substitute to peat based fertiliser. Peat is a limited resource with a very long production time. Peat bogs are important for rare and unique species and have a fundamental ecological role in the water cycle. They play an important role in storing carbon, which is released as carbon dioxide when a peat bog is damaged. Peat currently dominates the horticultural market because it is perceived as a fairly standardised product and therefore well-established and effective (EC,2003). However, the environmental impacts associated with its extraction are often overlooked. Wherever technically possible the use of compost should be encouraged, as it would help reducing the amount of peat that is extracted every year for gardening and also encourages moisture retention and soil absorption (Fitzpatrick, 2001).

3.11 Green wastes are biodegradable and release heat carbon, dioxide and organic residues when composting (SEERA, 2004). A recent study (Smith et al, 2001) has calculated that, over a 100-year period, the use of compost as a soil conditioner would store 54 kg CO<sub>2</sub>-equivalent per tonne of compost used, or some 22 kg CO<sub>2</sub>-equivalent per tonne of putrescible waste prior to composting. Although this figure is subject to a number of assumptions and considerations that suggest that it should be used with prudence, it can be said that the use of compost from the biodegradable fraction of municipal waste has the potential of storing up to 1.4·Mt CO<sub>2</sub>-equivalent per year in the Europe (EC,2003).



3.12 The environmental benefits of composting are likely to be greater than stated above given the qualitative benefits such as improved workability of soils, reduced erosion improved water retention and weed suppression. This mean more organic matter is kept in the topsoil, a reduced need for irrigation and lower application of pesticides (EC,2003). Composting of green wastes help to return organic matter to the soil and its use has been supported in Defra's Soil Strategy for the UK. The gases produced during composting make a far lower contribution to global warming than landfill, which releases methane.

3.13 Windrow composting usually releases fungal spores called bio-aerosols which can cause respiratory problems such as asthma if inhaled in sufficient quantities. The part of the composting process where the green waste is turned is the most significant in this respect. A site specific risk assessment is required for any green waste composting proposal that is within 250m of a sensitive receptor such as a house or workplace (Environment Agency, 2001). The risk assessment must propose site specific mitigation measures which eliminate any potential health risks from the operations. Beyond 250m the concentrations of bio-aerosols even from larger facilities are considered to have dispersed to background levels within the atmosphere (Environment Agency, 2001). Whilst composting can produce increased levels of bioaerosols, it is important to note that they are naturally occurring, and large quantities are released into the environment through activities such as harvesting of arable crops and mowing grass.

3.14 Odour problems can occasionally be associated with composting sites, if the composting process is not properly managed and anaerobic conditions occur. However, a number of measures can be introduced to eliminate the risk of odours. The most effective method is to ensure temperatures are regularly monitored and windrow are kept properly aerated through turning. However, other methods that can be used in addition include conducting the processing in a building with a bio-filter, in-vessel and forced aeration systems, as well as deodorant spray systems. Water pollution (including groundwater) can be a risk but can be effectively be controlled by good management. It is particularly important that the potential impacts of larger composting sites are taken into action in determining their location (stakeholder working group,2004).

3.15 A number of land use controls may have implications for the application of compost to land. These include groundwater protection zones and Nitrate Vulnerable Zones (NVZ), Sites of Special Scientific Interest (SSSIs), Special Areas of Conservation (SACs).

### 3.16 Economic Issues

3.17 Green waste composting sites, with the exception of small-scale “on-farm” schemes require significant investment in infrastructure in order to provide impermeable concrete pads, drainage systems and leachate lagoons. The construction costs will increase in proportion to the size of the area of concrete hardstanding required. The erection of buildings to house key parts of the process may be also be increasing required in the future if controls under the Waste Management Licensing system become stricter. Industry sources estimate that the smallest economically viable composting site which requires a Waste Management Licence is 20,000 tpa which would require a site area of about 2 hectares (Stakeholder Working Group, 2004). Secure markets for the recycled product and guaranteed supply are therefore essential in order to secure the necessary up-front investment. Unlicensed sites are viable at much smaller throughputs because the investment in infrastructure and staff is considerably lower, however the maximum annual throughput is about 3,500 tpa.

### 3.18 Codes of Practice:

Environment Agency technical guidance notes

Composting Association

- The Practical Guide to Compost Marketing and Sales
- The State of Composting in the UK 2001/2002
- Large-scale composting – A practical manual for the UK
- Wood Recycling: How to Process Materials for Profitable Markets
- The Composters’ Answers Book
- Composting Source Separated Organics
- Planning Officers Society Green Waste Composting Guidance Note

### 3.19 Current Key players

3.20 **Onyx Hampshire Limited** is the main waste management operator in Hampshire after winning the 25-year integrated waste management contract with Hampshire County Council in 1995. Today, this project, known as Project Integra has developed into a partnership between all the 11 Local Authorities in Hampshire and the private waste contractor Hampshire Waster Services.

3.21 **Project Integra** was set up in 1993, helping to introduce an integrated waste management strategy for Hampshire. The green waste recycling infrastructure in Hampshire has been set up through Project Integra and currently provides high recycling rates of household generated green waste.

3.22 **T J Composting** is one of the nominated sub contractors for Oynx for on farm composting in Hampshire.

### 3.23 **Supporting Organisations**

3.24 **Agricultural Waste Stakeholders Forum** involves Defra, the Environment Agency, the National Farmers Union and a range of other organisations with interests in agricultural waste.

3.25 The **Environment Agency** regulates waste management through a system of licences. The Agency registers and monitors the transportation of waste and advice on waste management methods.

3.26 The **Department for the Environment, Food and Rural Affairs (Defra)** is the Government department with prime responsibility for waste and resource management, as well as other forms of environmental protection and the promotion of Sustainable development.

3.27 The **Composting Association** is the United Kingdom's membership organisation promoting good practice in composting and the use of composted materials. The Association acts as a central resource for composting, researching, collecting and disseminating information and works to provide a united voice for composting in the UK, speaking to Central and Local Government about the benefits of composting and compost use.

3.28 The **Henry Doubleday Research Association (HDRA)** is Europe's largest organic membership organisation. It is dedicated to researching and promoting organic gardening, farming and food.

3.29 The **Community Composting Network** comprise over 125 members across the UK involved in community composting. Members include community composting projects, Local Authorities and other supporting organisations. The network provides advice and support to new and existing community composting projects as well as promoting community composting at a national level. It has helped to set up and support groups of people in a local community to pool organic materials to recycle larger amounts of waste and make larger amounts of compost than is possible at home.

3.30 **Commercial Composting UK** as an independent consultant in the compost field. It advises on all aspects of composting, from market analysis and development, to business planning, project management, specification, tendering, contract administration, construction supervision, commissioning and operation.

3.31 The **National Farmers Union (NFU)** is the organisation for farmers and growers in England and Wales, representing around three quarters of the full time commercial farmers of England and Wales. Its central objective is to promote successful and socially responsible agriculture and horticulture, while ensuring the long-term viability of rural communities.

3.32 The **Hampshire Farming Partnership** was set up in September 2002. The aim of the partnership is to maintain an overview of changes and trends in agriculture and related sectors in Hampshire, and to use informal influence to help shape future policies and programmes. The partnership also monitor changes and trends in farming and related sectors in Hampshire and the impact of policies and programmes, produces the Hampshire Farming Study, identifies gaps in implementing the recommendations and act on them where possible, disseminate information and feeds into related policies, strategies and plans at local, regional and national levels.

3.33 The **Waste and Resources Action Programme (WRAP)** is a not-for-profit company supported by Defra, the DTI, and the devolved administrations of Scotland, Wales and Northern Ireland. It is working to promote sustainable waste management by creating stable and efficient markets for recycled materials and products.

3.34 The **Soils Association** is the UK's leading campaigning and certification organisation for organic food and farming. It provides an organic accreditation of the composting standard.

### 3.36 **Examples of Current Best Practice**

3.37 **Pro-grow** compost is produced from material recycled collected through Hampshire's network of HWRCs and marketed through garden centres, HWRC's and major DIY chains. Pro-Grow is produced by Hampshire Waste Services as a Project Integra initiative and currently 30,000 to 40,000 tpa are sold (Oynx,2004). The product is currently being used by many local gardeners and growers including the Sir Harold Hillier Gardens and Arboretum, Vitacress, Organic Farmers, Southampton Football Club, Landscape gardeners and many parks and gardens throughout the county. It has also been used nationally at the Eden Project in Cornwall, the London Millennium Park, the roof garden at Harrods, the Princess of Wales memorial garden and the Canary Wharf Development.

3.38 In the London Borough of Southwark, a '**Community Composting on Estates**' scheme has been established to help communities to compost green waste using local green space. The project provides resident's groups across estates in the boroughs of Southwark and Lambeth with domestic waste collection bins and compost bins, and well as support and advice. The scheme was set up using funds from the DETR's Environmental Action Fund for staff and materials. The project involves raising the awareness of composting on housing estates and help set up and train small-scale locally-managed groups of residents who want to compost.

3.39 The **Test and Itchen Land Care Project** is a partnership organisation involving the Environment Agency, English Nature, Hampshire County Council, Defra, and the Hampshire and Isle of Wight Wildlife Trust. Its objective is to improve resource protection and management and help develop a viable rural economy throughout the Test and Itchen river catchments and considers the resources requiring improved protection and

management such as soils and landscapes. The Landcare approach includes best farming practices, risk analysis, farm planning and accreditation.

## Potential green waste issues up to 2020

### 4.0 Future Data Required

4.1 A database or information exchange is needed to provide information on sources of green waste, and composting sites. This could help link green waste producers with composters and facilitate the diversion of green waste from landfill.

4.2 The quantities of green waste arising from commercial sources needs to be investigated. A project to obtain this information is about to start, sponsored by Hampshire County Council Waste Management Section.

4.3 Data is required on the success rates of home and community composting schemes in order to determine the cost effectiveness of these schemes, and whether additional resources need to be allocated into promoting them.

### 4.4 Future legislation

4.5 Future legislation is expected to have an influence on green waste management which includes the Animal By-products Directive, the Directive on the Biological Treatment of Biological Waste, Review of Planning Policy Guidance 10 (PPG10): Planning and Waste Management, EU Thematic Strategy on Soil, Biowaste Directive, European Fertiliser Regulations. Until this legislation is introduced it is possible to determine its effect, however, it is not anticipated that new legislation will have a significant influence on the overall strategy for green waste (stakeholder working group, 2004)

### 4.6 Future green waste arisings

4.7 Home and community composting schemes can perform a role in reducing the quantities of green waste entering the general waste stream. Research has shown that the implementation of home composting schemes and their success depends on a number of different criteria including. These include the level of education and awareness building done by the local authority, and the social and economic characteristics such as the housing type and the age and culture of those involved in the schemes. The 2003 Composting Survey highlights for example that 57% of people said that they had been composting prior to the purchase of composting kits and the older they were the more likely they were to be established in their habit (Miller Associates, 2003). In addition, the survey also shows that property characteristics such as type of property and garden sizes has a bearing on the levels of composting undertaken. Whilst 58 % of semi detached households

in the survey composted, only 2% of flat dwellers did (Miller Associates, 2003).

4.8 Very small scale community composting schemes can also allow several household to join together and share a composting facility if there is an individual or organisation locally who is willing to manage the site. Community composting schemes can incorporate a social inclusion element, such as providing employment opportunities for people with disabilities that cannot access mainstream jobs market and have the same environmental benefits as home composting.

4.9 There is significant potential to divert household green waste that is currently disposed of in the mixed waste stream, into separated green waste. This most easily achieved through kerbside collection systems which are starting to be introduced in many Districts. About 20% of domestic bin waste is green waste suitable for windrow composting (Hampshire County Council, 1999). Free green waste collection schemes have around 90% take up of households in trials, but this drops to between 10 and 20% when a collection charge is introduced (stakeholder working group, 2004). For the purposes of determining likely future arisings of household green waste, a 90% take up has been assumed, although this will have implications for future collection costs.

4.10 Separated trade green waste arisings from the commercial sector vary in how easy they are to collect and compost. Landscapers and nurseries are the most obvious source of separated green waste, and with appropriate infrastructure it should be possible to capture the majority of this waste for composting. A figure of 80% recycling is thought to be realistic, however, data on the quantities arising is difficult to obtain, although the quantities are known to be "significant" (stakeholder working group, 2004). The remaining 20% is likely to be disposed of by other means.

4.11 Green wastes arising from the agricultural sector can be best managed on farms. This allows green waste to be composted for reuse as a soil conditioner, and removes any requirement for transportation or off-site processing. On-farm composting can be carried out without the need for planning permission, if it manages only green waste arisings produced on the same agricultural unit. This is covered in more detail in the agricultural waste paper, and is therefore not discussed further here.

4.12 There is also a significant potential source of green waste mixed in with general commercial waste which could be separated. The biggest producers are expected to be supermarkets who could potentially separate wastes such as cut flowers and unprocessed green food wastes, from cooked and mixed waste (stakeholder working group, 2004). A trial green waste collection scheme for a large Hampshire supermarket has already been attempted, and resulted in the recovery of 6-7 tonnes of green cut flowers and unprocessed green food waste per week (stakeholder working group, 2004). However, the scheme was discontinued once the trial was completed. It is unlikely that significant progress could be made with these types of producer unless landfill

becomes significantly more expensive. The separation of green waste results in a cost saving over landfill, and so this option is likely to become increasingly attractive (stakeholder working group,2004). Further research is required to determine the likely arisings of this type of waste and therefore a low figure of around 20% recovery has been assumed as the best currently achievable.

4.13 The levels of green waste arisings at bring sites and HWRCs in Hampshire are expected to increase fairly slowly. A projected figure of 65,500 tpa is given for 2009 (Hampshire County Council, 2003) and this figure projects to around 70,000 tpa by 2020 if the rate of growth remains the same. The amount of green waste in the general household waste stream has been projected to increase at around 1% per year in line with forecasts in the Regional Waste Management Strategy 2004. The projected figures are summarised in table 3. The figures for percentages of green waste recovered are those agreed with stakeholders are realistically achievable given adequate finance.

**Table 3 Green waste arisings in Hampshire, Portsmouth and Southampton**

Waste source	2003			2010			2020		
	Arisings (tpa)	% recovered	Volume recycled	Arisings (tpa)	% recovered	Volume to be recycled	Arisings (tpa)	% recovered	Volume to be recycled
HWRCs and bring sites	61 184*	100	61 184	65,500*	100	65 500	70 000+	100	70 000
Potential from general household	82 000	unknown	unknown	87 900	90+	79 110	97 100	90+	87 390
Separated green trade waste	50 399	20	10 000	54 035	80+	43 228	59 688	80+	47 750
Unseparated trade green (eg supermarket cut flowers)	50399	0	0	54 035	20+	10 807	59 688	40+	23 875
<b>TOTAL</b>	<b>243 982</b>	<b>-</b>	<b>&gt;71 184</b>	261 470	<b>76</b>	<b>198 255</b>	286 476	<b>80</b>	<b>229 015</b>

\*(Source: Hampshire County Council, 2003)

+(Source: Stakeholder working group estimate)

#### 4.14 Future Options for Resource Management

4.15 Green waste produced by households is currently well managed based on demand and infrastructure in the County however it is necessary to extend the current infrastructure to manage green waste arising from trade sources and divert additional quantities of green waste from household bins. The overall capacity figures also mask local infrastructure shortages, such as that in the south-east of the County where additional capacity is already required (stakeholder working group,2004). There is also further scope to increase the levels of home composting and community composting undertaken.

**Table 4 Composting capacity compared with future green waste arisings**

	Capacity	Arisings	Surplus/(Shortfall)
Year			
2003	148 000	77 000	78 000
2005	120 000	77 000	50 000
2010	120 000	>144 610	>(22 610)
2020	120 000	>157 390	>(37 390)

4.16 Home composting is the most environmentally friendly way of handling domestic biodegradable waste (EC,2003). The European Commission is likely to continue to actively support local authorities providing households with tools to compost in the backyard (EC,2003). The levels of success with home composting are partly dependant upon location. In rural areas, research shows that home composting is a good option because gardens are generally larger and space is available for composting. In urban areas housing is often higher density, and some gardens may be too small for home composting. In such cases, small scale community composting schemes are more appropriate, allowing several households to join together and share a composting facility.

4.17 It is considered that successful home and community composting schemes across the whole County could remove 3,000 tonnes of green waste from the waste stream each year. The provision of subsidised or free composting bins households, together with information on their use, combined with the introduction of communal composting bins for residences such as flats, and the active support of community composting schemes will make a small but worthwhile contribution to minimisation of green waste entering the waste stream. Research into the best ways to encourage composting within the home should be developed to ensure that the most efficient systems of home composting are put in place and they are targeted appropriately to each target community. The volumes of green waste anticipated to be home composting are not significant enough to have any effects on future waste forecasts, but will nevertheless represent a worthwhile saving in disposal costs.

4.18 Ideally, systems of green waste collection from the kerbside should be rolled over across the county and the systems should be come fairly uniform

county wide. Kerbside weekly collections through dedicated green waste vehicles have been shown to be most efficient and will help to feed the remaining capacity at the existing composting sites in the county. A system of targeted bin issuing for composting based on size of garden and housing density could be encouraged to implement more effective system of disposal. It is necessary to look in more detail at this issue and address whether the problem can be resolved through clever design or alternative composting methods. The success of current kerbside collections has not provoked a reduction in the amount of green wastes being deposited at HWRC'S and is seen instead to reduce the amount of green waste which are deposited in household bins (stakeholder working group,2004).

4.19 On farm composting sites will be subject to new exemption criteria which will impact the amount of waste which can be processed on such sites in the future and it is likely that from next year they will be only allowed to process up to about 400 tpa without obtaining a Waste Management Licence. This is likely to lead to the diversion of both household and trade waste away from "on-farm" composting sites towards the larger licensed sites. On-farm compost are therefore likely to become a small scale and very local facilities dealing in only very small quantities of trade waste (stakeholder workshop,2004).

4.20 New sites, or extensions to existing sites will be required to meet expected increases in the green waste collected, particularly from trade sources. Providing facilities of an appropriate size and in appropriate locations will be fundamental to future success, and the location should be carefully analysed with regards to traffic movements, demand and quantities which can be taken. Centralised urban schemes for areas with unsuitable gardens should also form a part of this infrastructure. Future developments of new composting sites will depend on demand.

4.21 The development of schemes such as forced aeration within the composting process could help to develop the market for composted products. Oynx predicts that forced aeration could increase throughputs at sites by 20%. Forced aeration requires less machinery and space than traditional forms of composting and is more environmentally friendly as the process is practiced under membranes which decreases the release of dust and bioaersols in the process. It also provides a better quality of product. Although the initial operational costs are high for such a treatment, the long term capital benefits are far greater than traditional windrow composting. Unfortunately forced aeration systems could not be economically fitted at existing sites but this is a potential option for the future (stakeholder working group,2004).

4.22 Due to the fact that sites under 20,000tpa are not currently commercially viable, in areas that do not produce sufficient green waste to support a site of this size, an alternative will need to be found. Small local capture sites in appropriate areas could be used to bulk material prior to onward transportation to the main green waste processing sites. These facilities could be as simple as standard waste containers stored in the open,

with supervision (stakeholder working group,2004). This would be particularly useful in the districts and wards without green waste processing sites such as the New Forest.

4.23 Worm farms are a potential method of green waste composting but are not widespread in Hampshire at the current time. Establishing a worm farm is fairly low in cost but takes a lot of land and regulation as the beds require regulated temperature and moisture levels. The process is also quite slow. However, a very high quality product is produced in the long term. Worm farms can also take partially finished forms of compost and which can be reprocessed to form a better quality product. There were plans for a wormery at Hurst Farm in Fishers Pond to serve waste from Marwell Zoo. However, plans have currently stalled on this project although planning permission was granted in 2003.

4.24 There are also opportunities to mix green wastes with other wastes to form new products which could be explored. This includes mixing green wastes with other wastes such as treated sewage sludge's or domestic biowastes. Separation of the woody residues can also increase the annual throughput by around 20% due to the additional space available for more easily composted material. The markets for this type of product are still being developed, but it has successfully been introduced by Oynx who market the product as Profuel.

#### 4.25 **Social Issues**

4.26 Promotion of composting in the future is very important to the future uptake of new schemes and initiatives. Education is required in order to change habits and increase the amount of biodegradable waste composted at home and in small scale community and allotment schemes. This could be done through initiatives in schools and other education facilities as well as encouraging allotment associations to appoint composting representatives to oversee. The County Council's Education Department could help through liaison with schools, and Hampshire Waste Services teaching aids should be actively promoted. Other initiatives could also be set up and schemes such as a Hampshire 'Composter of the Year' was suggested at the last workshop. This could be set up through Project Integra and be supported by the relevant composting organisations such as the Composting Association. The scheme would seek to encourage higher rates of composting of green wastes and should be targeted more towards the trade waste side of the sector. In addition, there is a need to develop awareness of the benefits of green waste composting and recycling to businesses throughout the county

4.27 Eastleigh, East Hampshire, Hart and Gosport have door step green waste collection systems in place and Fareham, New Forest, Portsmouth, Rushmoor, Southampton, Test Valley and Winchester are intending to have garden waste collections up and running by the end of this financial year (2004-2005). It is important to ensure that good and practical advice is provided on how to compost at home, both to increase the quality of the compost produced, and reduce any adverse effects (such as smells) from the

process. There is a need to analyse how effective green waste collection promotion has been to date in terms of end product, take up and success of the trials to ensure it is a viable option before the programme is extended further and to tackle any falls in participation rates which may be felt once a scheme is in place. What often takes place is that once the trials end, public participation decreases. This is usually associated with the costs associated with the systems which have often been introduced following the end of the trials.

4.28 The capability of green waste recycling on reducing the amount of green waste being disposed of at landfills also needs to be assessed, particularly in light of the recent districts and borough councils uptake on kerbside collections schemes for green waste.

4.29 Further research is required into other Local Authorities and what methods of green waste disposal are implemented to learn from any best practice examples. It is also important to assess the overall take up of the schemes, rather than for example, just focus on the number of compost bins provided. This is because in the past small compost bins have been used for storing children's toys for example.

4.30 The public perception of green waste issues including gardening practices is also an area identified for further investigation. Tackling the more sustainable use of green waste as well as practices such as grass cutting and trimming could save a significant amount of green wastes needing to be processed.

#### 4.31 **Environmental Issues**

4.32 The development of different methods of green waste processing could be a possibility for the future. The county council could use its own farmland to test such practices to see if they are viable for a county wide implementation.

4.33 The composting process produces heat and it may be possible to manage this to provide benefits. Where composting is carried out within buildings it is likely that the heat generated by the process would provide sufficient heat to reduce or eliminate energy bills for heating. Composted materials can be potentially used on brownfield sites in order to improve the quality of the land and bring it back into beneficial use, without redeveloping it. This has successfully been shown throughout the country on a number of sites including the Millennium Park at Greenwich where green waste was mixed with subsoils to redevelop heavily contaminated land and at Bluewater Park in Kent where green waste was used for soil blending by Oynx in partnership with a number of other companies.

4.34 In order to provide end users with a product of guaranteed quality composts should be classified according to the level of impurities and nutrients. Different types of quality could be envisaged, different types could allow a differentiation of uses, for instance use in pots for most mature

composts and agriculture/horticulture preferably for composts with a highest content of nutrients (EC,2003).

#### **4.35 Economic Issues**

4.36 Green waste composting has the capability of saving large amounts of capital for businesses who currently dispose of such wastes to landfill. However, the costs of landfill in relation to alternatives, are often not fully recognised. The MRS could take the lead in developing schemes to encourage joint working for green composting, publicising the costs to be saved and ownership and knowledge of businesses over where their green waste is disposed of. A first priority could be assessing the business directories to target the companies in which green waste disposal is key.

4.37 The markets for green waste are quite secure at presently and will continue to develop as the quantities collected and the demand for recycling and its products increase.

4.38 Economic subsidies are often put in place by local authorities to support green waste collection schemes. These can often be a significant investment and one which is likely to increase as collections are widened. The economic viability of such outlays must be assessed to ascertain whether it is sustainable to invest such money in systems which may not be profitable and in systems where participation rates are low.

4.39 Recycled compost can be marketed through retailers, allotment holders and at HWRCs. It is important to market the compost as a gardening product in its own right, rather than as a recycled waste product. In addition, more education of businesses about the money that could be saved through segregating their green waste for composting rather than relying on landfill. This would apply particularly to supermarkets, and vegetable and salad packers who may produce large quantities of high quality unprocessed green material that is suitable for composting.

4.40 Another way which could encourage the greater use of recycling and composting could be through the introduction of tax breaks to those households which reduce the amount of biodegradable waste to be collected through home composting. This would not only help in market development, but it would also enable a focus to be made on the quality and price of green waste products making it cheaper whilst the superior quality of the material will remain the same.

4.41 The County Council should demonstrate best practice by purchasing recycled green-waste compost for use on all of its land. Green procurement could be promoted by HCC using the products on its own lands on a large scale, to promote its use in particular to large landowners. Current use of the product on high profile sites such as at the Hillier Gardens should be promoted. Material such as Pro Grow could be specified for use on all developments, and this is a practice which has already practiced on some projects through the Landscape Architects group at the County Council.

Public sector organisations could encourage the use of compost as a substitute for peat and other raw materials extracted from the environment whenever possible, in particular as a component in soil improvers, growing media, mulches, potting soil and in soil dressing for landscaping purposes. Appropriate measures to encourage the use of compost in public procurement contracts could be established. The County Council could also help to facilitate business contacts to help in the development of markets and products for green waste. [ could we make it a requirement of planning permissions to encourage the use of composting in developments?]

4.42 The future of composting within the environment should be linked into the development of the Hampshire Soils Strategy and HCC should take a lead in this and ensuring that this happens. This will also give the opportunity to share resources, information and good practice.

4.43 It may be important to consider insurance liability for recycled products, schemes which require compost to meet certain minimum standards will help reduce potential risks to insurers and premiums.

4.44 Secure markets for the recycled product and guaranteed supply are therefore essential in order to secure the necessary up-front investment and should be observed for their benefits in the longer term rather than for their immediate benefits. There are unexploited agricultural outlets for compost in Hampshire which could be developed. This may be produced “on-farm” using agricultural biowaste only, or through imported household produced green waste. Accredited organic farms will find recycled compost of particular benefit because they are unable to use chemical fertilisers.

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*Hampshire Soil Strategy*

**Interviews**

Mary Messer – Composting Association (15 April 2004)  
 Peter Mills – Onyx (17 May 2004)  
 Stakeholder working group meeting (23 June 2004)

**Websites**

[www.urbanmines.org.uk/background.htm](http://www.urbanmines.org.uk/background.htm)  
[www.financewales.co.uk/eng/news.php/id=74](http://www.financewales.co.uk/eng/news.php/id=74)  
[www.wrap.org](http://www.wrap.org)

## Appendix 1

### Kerbside Collections of Green Waste 2003 – 2006 [need to finish updating]

District	Collection Scheme	Collection method	% of district covered by 2005/6	Expected tonnage		
				2003/4	2004/5	2005/6
<b>Basingstoke</b>	The possibility is being discussed	-	-	-	-	-
<b>East Hants</b>	Collection system in place	Polypropylene bag, (£12 per annum pro rata) fortnightly collection		950	978	1010
<b>Eastleigh</b>	Trial completed, roll out over borough planned	Polypropylene bag, (£12 per annum pro rata) weekly collection	100%	454	1524	2344
<b>Fareham</b>	Plans for trial before 2004	-	No data	No data	No data	No data
<b>Gosport</b>	Collection system in place	Green plastic sack, (£1 per bag) fortnightly collection	100%	245	253	261
<b>Hart</b>	System in place	Woven Polypropylene sack, (£20 annual fee) fortnightly collection	90%	25	925	1775
<b>Havant</b>	No plans	-	-	-	-	-
<b>New Forest</b>	Plans for one in 2004	Reusable sack, fortnightly collection	25%	0	500	1000
<b>Portsmouth</b>	Scheme expected 06/04	Collected from 1 metre cubic capacity grab bag (£20 per bag), fortnightly collection from Mar-Nov	60%	0	500	1000
<b>Rushmoor</b>	Plans for one in 2004		20%	0	0	850
<b>Southampton</b>	Plans for one in 2004	Reusable bags, (£15 per bag) weekly collection	63%	1000	2227	2931
<b>Test Valley</b>	Plans for one in 2004	Reusable sack, charged, fortnightly collection	96%	5070	5272	5431
<b>Winchester</b>	Trial planned for 2004/5	Reusable sack, Free collection, district wide	No data	No data	No data	No data

(Source: Based on report by Project Integra, 2003, Waste Volume Service Plan )

## **Appendix 2          Green Waste Recycling Options**

### **Issues/Opportunities (general)**

- The resource stream is well established as recyclable and does not require radical rethought.
- More opportunities need to be taken to capture green waste arising in the commercial sector.

### **Proposed Actions (for MRS partners)**

- Encourage waste reduction by increasing participation in home composting.
- Encourage proposals to capture of more separated green waste from the commercial sector
- Opportunities for the public procurement of compost produced from green waste, and the specification of this material in public sector tender documents where appropriate should be exploited. Public sector bodies such as parks, gardens and highways departments should be influenced to compost their green waste.
- Existing composting infrastructure should be used to process waste from the commercial sector, and this capacity should be marketed

### **Proposed Policies (wording is indicative)**

- The home composting of household green garden waste should be actively promoted as the best management option.
- The provision of small scale green waste transfer facilities should be encouraged in areas which do not generate sufficient quantities of green waste to support an economically viable composting facility
- Proposals for new facilities to process trade waste, and to process trade waste at existing sites processing household green waste should be supported.

### **Proposed Options**

#### **Option 1 (baseline)**

- The proposal would use the three existing open air windrow composting sites which would have a combined capacity of 120,000tpa, devoted mainly to household produced green waste.

- Piecemeal chargeable doorstep green waste collection schemes (expected take up of about 20% of households).
- Promotion of home composting through existing channels.
- Marketing of compost through existing channels.

Percentage recycled – 18%.

Infrastructure Required – None

Cost - This would be a low cost option for both households and business.

### Option 2

- The proposal would use the three existing open air windrow composting sites which would have a combined capacity of 120,000tpa, devoted mainly to household produced green waste, plus construction of a minimum of 20,000 tpa additional capacity with forced aeration systems and an increase in the capacity for acceptance of trade waste in line with demand. Permit trade green waste to be composted at existing sites. New green waste transfer stations in areas where a need can be identified.
- Chargeable green waste collections introduced in every district and the cities (estimated average charge £15 per year) and the two cities (expected take up of about 10-20% of households).
- Promotion of home composting through existing channels.
- Marketing of compost through existing channels, plus creation of additional market through the specification of compost produced from green waste in public sector contracts where possible

Percentage recycled – 65%.

Infrastructure required – minimum 20,000tpa additional capacity plus transfer stations.

Cost - This would be a low cost option for households and medium cost to business (due to the expense of construction of new composting infrastructure with forced aeration systems).

### Option 3 (stretching best practice)

- The proposal would use the three existing open air windrow composting sites which would have a combined capacity of 120,000tpa, devoted mainly to household produced green waste, plus construction of a minimum of 100,000 tpa additional capacity with

forced aeration systems and an increase in the capacity for acceptance of trade waste in line with demand.

- Free doorstep green waste collection introduced in every district and the cities (expected take up of about 90% of households).
- Additional public sector resources put into promotion of home composting, providing composting advice to householders.
- Additional public sector resources put into liaising with businesses and assisting them to segregate and compost more green waste.
- Additional public sector resources put into awareness raising marketing of composts produced from green waste.

Percentage recycled – 80%

Infrastructure required – minimum 100,000tpa additional capacity plus transfer stations

Cost - This would be a high cost option for households (due to subsidy required for green waste collection schemes and the additional resources required for promotion of composting) and medium cost to business (due to the expense of construction of new composting infrastructure with forced aeration systems).

Scenario	Recycling rate	Infrastructure
Option 1	18% recycling	No new infrastructure
Option 2	65% recycling	One facility of at least 20,000tpa capacity, which could accept waste from the Portsmouth area. New green waste transfer stations where demand is identified.
Option 3 (stretching best practice)	80% recycling	Fewer large scale facilities of 100,000tpa total capacity. New green waste transfer stations where demand is identified.
Option 3 (stretching best practice)	80% recycling	100,000tpa capacity of additional dispersed facilities of at least 20,000tpa capacity each. New green waste transfer stations where demand is identified.

### **Other options**

In-vessel composting, anaerobic digestion and MBT could potentially be used to manage green waste but are not considered realistic at the current time as viable management methods.

There are linkages between this resource stream and food/residuals and wastewater which may allow co-processing or anaerobic digestion when resource streams are aggregated.

In producing the recycling figures the following assumptions have been made:

Data on the levels of green waste produced in the commercial sector is not available. It has therefore been assumed that half of the total biodegradable commercial waste arisings are green, and half are other types of biodegradable waste, and that this will remain the case in 2020.

There is also no data regarding the total amount of commercial green waste which is separated, and the amount which is currently mixed but could potentially be separated. It has therefore been assumed that half of all commercially generated green waste is currently separated, and half is currently mixed with the potential for separation, and that this will remain the case in 2020.

## Appendix 3 MRS RESOURCE STREAM ANALYSIS

### RESOURCE STREAM APPRAISAL

#### KEY FEATURES OF PREFERRED OPTION FOR GREEN WASTE

Option selected – Stretching Best Practice (5 small composting facilities)

Arisings (tonnes per annum)

	2003		2010		2020	
	Household	C&I	Household	C&I	Household	C&I
Green Waste	143,309	100,797	153,540	108070	167,100	119,376
TOTAL	143,309	100,797	153,540	108070	167,100	119,376

Resource Recovery (tonnes per annum)

	2004		2010		2020	
	Household	C&I	Household	C&I	Household	C&I
Green Waste Reuse	0	0	0	0	0	0
Green Waste Recycling	61,000	16,000	144,610	54,035	167,100	71,625
Unavoidable Waste	82,309	84,797	8,930	54,035	9,710	47,751

#### Existing Infrastructure

Site (District)	Max Capacity (tpa)
Little Bushy Warren, Herriard	75,000
Chilbolton Down, Leckford	25,000
Down End Quarry, Fareham	20,000
Blackmoor Estate, Blackmoor	3,500*
Manor Farm, Hayling Island	3,500*
+Thorns Farm, Lymington	3,500*
Broughton Down Farm, Broughton	3,500*
The Pebbles, Boarhunt	3,500*
+Down Farm, Odiham	3,500*
Frigo Farm, Longparish	3,500*
Rockbourne, Fordingbridge	3,500*

#### Additional Infrastructure Requirements

The proposal would use the three existing open air windrow composting sites which would have a combined capacity of 120,000tpa, devoted mainly to household produced green waste, plus construction of a minimum of 100,000 tpa additional capacity with forced aeration systems and an increase in the capacity for acceptance of trade waste in line with demand.

### **Collection Infrastructure Requirements**

Free doorstep green waste collection introduced in every district and the cities (expected take up of about 90% of households).

### **Societal Change Requirements**

Additional public sector resources put into promotion of home composting, providing composting advice to householders.

Additional public sector resources put into liaising with businesses and assisting them to segregate and compost more green waste.

### **Market Development / Initiatives**

Additional public sector resources put into awareness raising marketing of composts produced from green waste.

### **Cost**

This would be a high cost option for households (due to subsidy required for green waste collection schemes and the additional resources required for promotion of composting) and medium cost to business (due to the expense of construction of new composting infrastructure with forced aeration systems).

### **Government Action Required**

None