DREHID MECHANCIAL BIOLOGICAL TREATMENT (MBT) FACILITY,

NEED ASSESSMENT REPORT

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TABLE OF CONTENTS

1 INTRODUCTION

This Report has been prepared as part of the assessment of the potential to develop the Drehid Mechanical Biological Treatment (MBT) Facility in the townlands of Coolcarrigan, Drummond and Kilkeaskin, Carbury, Co. Kildare.

The purpose of this Report is to provide a clear and concise scrutiny of available data and trends to assist in the forming of a definitive opinion of the potential to develop the Drehid MBT Facility. The Report has been compiled, having regard to:

a) Current Waste Policy and Legislative Drivers;
b) Current waste disposal and recovery facilities in the Kildare, Wicklow, Midlands[1] and South Eastern[2] Waste Management Regions; and,
c) Trends evident from recently published data on waste statistics.

The information sources used in the compilation of this Report include the following:

- Environmental Protection Agency (EPA) Waste Licences;
- EPA Annual Environmental Reports for licensed facilities;
- EPA National Waste Report 2010;
- An Bord Pleanála Planning Decisions;
- EPA Municipal Solid Waste – Pre-treatment & Residuals Management An EPA Technical Guidance Document;
- EU Landfill Directive (1999/31/EC), Article 5;
- DKM Economic Consultants – Report on the Potential Fines for Non-Compliance with the EU Landfill Directive (Dec 2009);
- DoEHLG -National Strategy on Biodegradable Waste (2006);
- Central Statistics Office; and,
- CRÉ –Composting Association of Ireland Teo.

Section 2 of this Report provides an assessment of the policy and legislative drivers currently in place and clearly demonstrates the need for the Drehid MBT Facility to provide for the diversion of waste from landfill.

Section 3 of the Report provides an overview of the existing waste disposal and recovery facilities in place in the Kildare, Wicklow, Midlands and South Eastern Waste Management Regions. This section shows that a significant tonnage of MSW is still being disposed to landfill within the regions and that there is an unambiguous need for the Drehid MBT Facility to provide for the diversion of waste from landfill.

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1 The Midlands Waste Management Region includes Offaly, Laois, Longford, Westmeath and North Tipperary.

2 The South Eastern Waste Management Region includes Kilkenny, Waterford (City and County), South Tipperary, Wexford and Carlow.

The purpose of Section 4 of this Report is to demonstrate that the scale of the Drehid MBT Facility at 250,000 tonnes per annum (TPA) is appropriate. As the movement of waste is quite fluid and, moreover it is difficult to quantify the actual quantity of municipal waste arising in each region, this assessment has been carried out on the basis of 3 separate scenarios, each of which take into account current pre-treatment capacity and rates of recycling:

- Scenario 1 – Waste projections based on the current volume of waste landfilled in the 4 No. regions;
- Scenario 2 - Waste projections based on the current volume of waste arisings in the 4 No. regions; and,
- Scenario 3 – Waste projections based on a pro-rata estimation of regional waste arisings based on overall national population and waste volumes and regional population statistics.

This approach provides for a more robust assessment of the need for the facility.

This Need Assessment Report has focussed on the Kildare, Wicklow, Midlands and South Eastern waste management regions as these regions are proximal to the proposed MBT Facility. These specific regions are chosen as they do not have the requisite large-scale recovery/pre-treatment infrastructure already in place and/or because the necessary regulatory permits are not in place for such facilities.

As a result, the additional and potentially significant waste volumes from the North Eastern Waste Management Region and, more particularly, the Dublin Waste Management Region have been omitted from this need assessment.

As such, a very conservative approach has been adopted and the basis of the need assessment presented herein will not be jeopardised if/when currently permitted facilities outside the four subject waste management regions are developed. For instance the development of the 600,000 tonnes/annum Poolbeg Energy from Waste (EfW) Facility proposed to serve the Dublin Waste Management Region will not negatively impact on the need for the Drehid MBT Facility. This is not to suggest that waste could not, or indeed will not, be accepted from outside the four subject waste management regions in the future. Specifically if the Poolbeg Energy from Waste (EfW) Facility does not proceed to construction, the need for the Drehid MBT facility will be even greater compared to the proven need demonstrated herein.

2 WASTE POLICY AND REGULATORY DRIVERS

The proposed MBT Facility will enhance recycling/recovery rates in the Kildare, Wicklow, Midlands and South Eastern waste management regions. The MBT Facility will also ensure that waste (that is not recycled or recovered by the MBT process) is adequately pre-treated prior to being disposed to landfill in compliance with prevailing waste licence conditions for landfills.

The facility also provides for compliance with the EPA guidance on Municipal Solid Waste Pre-treatment and Residuals Management and contributes to achieving the targets outlined in the 1999 Landfill Directive (1999/31/EC). Ultimately, this will allow for the more sustainable use of previously permitted and available disposal capacity by ensuring that all waste that is finally disposed of to landfill has been subject to pre-treatment and optimum rates of materials recycling and recovery are achieved, in accordance with the waste hierarchy.

2.1 EU Landfill Directive (1999/31/EC)

Article 5 of the EU Landfill Directive (1999/31/EC) sets out a requirement for Member States to establish a national strategy for the reduction of biodegradable waste going to landfills. In addition, Article 5 of the Landfill Directive sets out specific pre-treatment obligations for biodegradable municipal waste (BMW)[3]. These BMW diversion obligations are a sub-set of the waste treatment requirements, and have specific limitations in respect of the tonnage of BMW that can be accepted at landfills.

These limitations – which are tied to the 1995 statistical base year for waste production in Ireland – are phased, with each phase possessing a stricter obligation in relation to diversion. Ireland negotiated with the EU Commission for a four-year extension to the first two compliance dates specified in Article 5 (2006 to 2010, and 2009 to 2013 respectively).

These obligations can be summarised as follows:

- By 16th July 2010, Ireland can only landfill a maximum of 75% of the BMW generated in 1995 (i.e. 916,000 tonnes per annum (TPA))
- By 16th July 2013, Ireland can only landfill a maximum of 50% of the BMW generated in 1995 (i.e. 610,000 TPA)
- By 16th July 2016, Ireland can only landfill a maximum of 35% of the BMW generated in 1995 (i.e. 427,000 TPA).

[3] The EPA defines biodegradable municipal waste (BMW) as those elements of the household, commercial (including non-process industrial waste) and cleansing waste streams that will rot or degrade biologically. The main constituents of the biodegradable proportion of municipal waste are typically parks and garden waste, food waste, timber, paper, card and textiles.

The scale of the financial penalties which might apply were reported on by DKM economic consultants in 2009[4], and they estimated that *"the Daily Penalty that might be imposed in Ireland for non-compliance with an ECJ judgement would range from €1,884 for the least serious infringement that has been in place for a very short time to €113,040 for the most serious infringement that has been in place for 2½ years or more after the relevant judgement"*. It was also estimated that *"For an infringement that lasts one year, the lump sum fine for Ireland would range between €229,200 and €4,584,400"*.

Based on the above, there is a clear need for the development of facilities, such as the Drehid MBT Facility, which will provide for the diversion of BMW from landfill.

2.2 DoEHLG (2006) National Strategy on Biodegradable Waste

The *'National Strategy on Biodegradable Waste'* set out Government policy for the diversion of BMW from landfill, building upon the key objectives established in preceding DoEHLG policy documents. The primary focus of the policy was tackling the challenge of meeting the limits set for the quantity of biodegradable municipal waste which is permitted to be sent to landfill under the EU Landfill Directive (1999/31/EC).

In order to meet the targets set out in the various Waste Management Plans, the *'National Strategy on Biodegradable Waste'* highlighted that a *"several-fold increase in recycling capacity and biological treatment capacity is required"* and that *"there is therefore an urgent need to procure the necessary alternative waste treatment capacity which will facilitate diversion of biodegradable municipal waste away from landfill[5]"*.

One of the ways the *'National Strategy on Biodegradable Waste'* envisages this happening is through the increased use of Mechanical Biological Treatment (MBT):

> *"MBT can provide an outlet to limit the quantity of biodegradable municipal waste which ultimately needs to be sent to landfill[6]"*.

The *'National Strategy on Biodegradable Waste'* goes on to specifically refer to Mechanical Biological Treatment as part of an overall strategy to reduce the environmental impacts of landfilling and meet the targets set in the EU Landfill Directive. This approach is illustrated in Figure 2.1.

[4] Potential Fines for Non-Compliance with the EU Landfill Directive (Dec 2009), DKM Economic Consultants

[5] Section 2.2.7, Page 25, '*National Strategy on Biodegradable Waste*', DoEHLG, 2006

[6] Section 2.2.7, Page 25, '*National Strategy on Biodegradable Waste*', DoEHLG, 2006

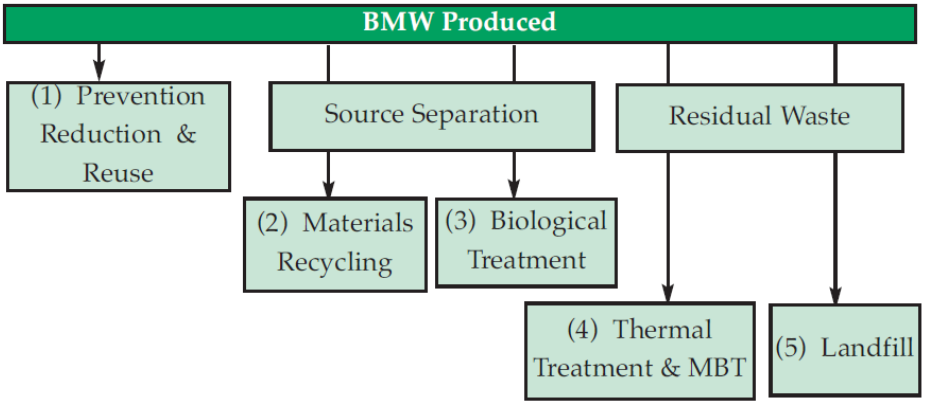

Figure 2.1: Summary of National Strategy on Biodegradable Waste Approach

Source: Section 5.1, Page 40, National Strategy on Biodegradable Waste', DoEHLG, 2006

2.3 EPA National Waste Report 2010 (published in March 2012)

The objective of the EPA's *National Waste Report* is to present the most up to date information available on waste generation and management in Ireland, as reported to the EPA. The EPA also provides commentary within this report on Ireland's current state of compliance with the EU Landfill Directive targets for biodegradable municipal waste diversion from landfill.

The most recent report is for the calendar year 2010 and deals with municipal solid wastes, waste streams subject to producer responsibility initiatives as well as construction & demolition and hazardous wastes.

According to the report, the economic downturn is having a marked influence on waste generation, which has decreased by 16% since it peaked in 2007. Household waste generation is decreasing in line with decreasing personal consumption, this despite a population increase.

The Report states that
"The economic downturn (and consequent reduction in waste generation) has resulted in Ireland moving towards achievement of the EU Landfill Directive targets for biodegradable waste diversion. There remains some risk that Ireland will fail to meet the July 2013 and 2016 Landfill Directive targets for diversion of biodegradable municipal waste from landfill (a further 250,000 t of biodegradable municipal waste will need to be diverted from landfill in order to meet the 2013 target and 433,000t diverted to meet the 2016 target)."

In relation to achievement of nationally expressed waste management targets Ireland has been less successful. Of note is the report's reference to Ireland remaining *"underdeveloped with respect to the sophistication of essential waste infrastructure for the pre-treatment of municipal waste prior to disposal (e.g. anaerobic digestion, waste to energy, mechanical*

biological treatment etc.)[7]".

The Report states that *"it will be a challenge to meet waste diversion and waste recovery targets if municipal waste generation increases with economic recovery and the necessary waste infrastructure is not in place".*

The Report notes that the EU Waste Framework Directive (2008/98/EC), transposed into Irish legislation by the European Communities (Waste Directive) Regulations 2011 (S.I. No. 126 of 2011) will be a significant influence and driver of change in waste management practices and governance in Ireland and elsewhere over the coming decade, particularly with the legal obligation to ensure that waste is managed in accordance with the waste hierarchy[8].

The profile of the activities proposed for this facility, including the optional Dry Anaerobic Digestion element, mean that the proposed development can be classified as a recycling and energy recovery facility as per the Waste Hierarchy (which is illustrated in Figure 2.2 below).

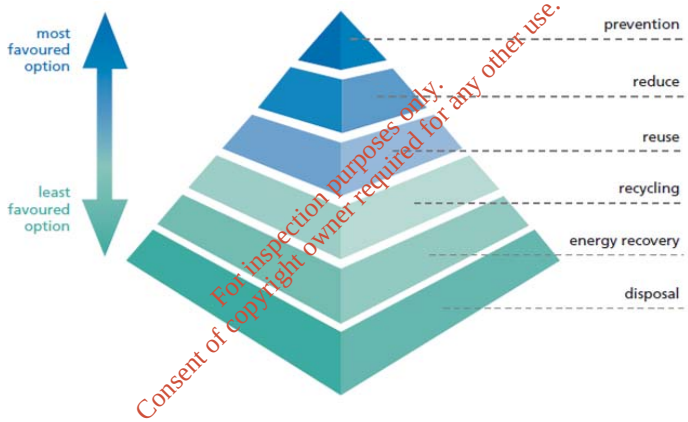

Figure 2,2 ***European Union Waste Hierarchy***

The Report concludes that the diversion of very large quantities of biodegradable waste from landfill remains a priority that must be addressed, as does the improvement in recycling rates for municipal wastes. In addition, the priority actions for biodegradable municipal waste management in Ireland for the foreseeable future are similar to those identified in previous National Waste Reports, and include the need to (amongst others):

> *"Ensure there is adequate infrastructure for the bio-stabilisation of waste treatment residuals destined for landfill. Whilst much of the effort to date in relation to biodegradable waste has been around the source separation and treatment of the collected fraction, the waste characterisation surveys undertaken for the EPA demonstrate that a residual bin from a 3-bin collection service will still contain a*

[7] Page xii, National Waste Report 2010, EPA, 2012

[8] Page xii, National Waste Report 2010, EPA, 2012

considerable fraction of biodegradable materials (up to 47% for household collections). If Ireland is to meet the 2013 and 2016 EU Landfill Directive diversion targets, then infrastructure will have to be developed that will treat this residual fraction;"

It is clear from the above that there remains an unambiguous need for the development of facilities, such as the Drehid MBT Facility, which will provide for the diversion of BMW from landfill.

2.4 Landfill Licence Conditions

The current EPA Waste Licences for landfills have a number of conditions relating to the acceptance of pre-treated municipal waste.

These conditions include a maximum percentage of biodegradable municipal waste that will be permitted for acceptance at landfills and also that the treatment of waste prior to disposal in the landfill must reflect pre-treatment technical guidelines published in 2009 by the Agency – *Municipal Solid Waste –Pre-treatment and Residuals Management: An EPA Technical Guidance Document*.

The following limits for the acceptance of biodegradable municipal waste therefore apply for operational landfills (including for and by way of example, the landfill at Drehid, Co. Kildare, Condition 8.1.2, EPA Waste Licence No. W201-03):

(i) *"From July 1st 2010 to June 30th 2013 inclusive, a maximum of 47% by weight of municipal solid waste (MSW) accepted for disposal to the body of the landfill shall comprise biodegradable municipal waste (BMW), measured on a calendar year basis or, in 2010 and 2013, part thereof.*

(ii) *From July 1st 2013 to June 30th 2016 inclusive, a maximum of 30% by weight of MSW accepted for disposal to the body of the landfill shall comprise BMW, measured on a calendar year basis or, in 2013 and 2016, part thereof, and*

(iii) *From July 1st 2016, a maximum of 15% by weight of MSW accepted for disposal to the body of the landfill shall comprise BMW, measured on a calendar year basis or, in 2016, part thereof. "*

Of course, these should be considered as limits, not targets, and over-achievement is desirable in order that as much BMW as possible is diverted from landfill.

It should also be noted that additional conditions (such as Condition 8.1.4 of the EPA Waste Licence for the existing Drehid Landfill, Co. Kildare) state that any waste accepted at the landfill that has been biostabilised through a process such as composting and/or anaerobic digestion will not be considered as biodegradable municipal waste. The requirements of this condition apply to all operational landfills.

"8.1.4 Determination of biodegradable municipal waste content of municipal waste

8.1.4.1 The licensee shall determine the biodegradable municipal waste content of MSW accepted for disposal to the body of the landfill. Waste that has been bio-stabilised in accordance with Condition 8.1.4.4[9] shall not be considered BMW.

8.1.4.2 Bio-stabilised residual wastes meeting the requirements of

-Condition 8.1.4.4 or

-an alternative protocol as may be agreed by the Agency based on biological treatment process parameters (e.g. validated residence time and temperature parameters at the treatment facility),

received at the landfill facility may be included in the determination of MSW quantities accepted at the facility for the purposes of Condition 8.1.2."

Again it is clear from the above that there is a need for the development of facilities, such as the Drehid MBT Facility, which will provide for the diversion of BMW from landfill and for the biostabilisation of the BMW fraction of MSW.

[9] Condition 8.1.4.4. of the EPA Waste Licence No. W201-03: "In the case of bio-stabilised residual wastes, stabilisation means the reduction of decomposition properties of the waste to such an extent that offensive odours are minimised and that the respiration activity after four days is <10mg O_2g/DM until 1 January 2016 and <7mg O_2/DM thereafter.

3 EXISTING LANDFILL / WASTE TREATMENT FACILITIES

3.1 Existing Landfill and Waste Treatment Facilities within the subject Waste Management Regions

According to the EPA National Waste Report 2010, the most recently available records, a total tonnage of 630,911 tonnes of municipal solid waste was accepted at landfills within the four subject waste management regions during 2010.

The table below, Table 3.1, includes details of the landfills within each region and the tonnage of waste that was accepted at each during 2010.

EPA Licence Reg. No	Landfill	Waste Management Planning Region	Household Waste Disposed (t)	Cleansing Waste Disposed (t)	Commercial Waste Disposed (t)	MSW Disposal to Landfill (t)	Municipal Organic Waste (stabilised waste and woodchip) recovered to landfill (t)
W0047-02	Kerdiffstown*	Kildare	768	0	2,893	3,661	0
W0081-03	KTK Landfill Ltd*	Kildare	1,720	0	0	1,720	996
W0201-03	Drehid Waste Management Facility	Kildare	177,960	207	140,928	319,096	0
W0026-03	Kyletalesha	Midlands	10,970	456	38,243	49,669	0
W0028-03	Ballydonagh*	Midlands	15,184	335	6,908	22,428	0
W0029-04	Derryclure*	Midlands	10,922	0	5,951	16,873	0
W0078-03	Ballaghveny*	Midlands	14,517	531	1,931	16,978	7
W0025-03	Powerstown	South East	4,776	2,401	338	7,515	0
W0030-02	Dunmore *	South East	543	173	285	1001	0
W0074-03	Donohill	South East	8,057	918	215	9,190	491
W0191-02	Holmestown	South East	29,993	794	1,815	32,602	1,180
W0066-03	Rampere	Wicklow	25,941	773	1,294	28,007	0
W0165-02	Ballynagran	Wicklow	25,726	17	96,428	122,171	8,263
Totals			**327,077**	**6,605**	**297,229**	**630,911**	**10,937**

Table 3.1. Waste Management Facilities and Waste Tonnage Deposited in 2010.

** These landfills are now closed or temporarily closed to the acceptance of waste direct to the landfill. Derryclure and Dunmore still accept waste from members of the public at the civic amenity site but not on a large scale from waste contractors.*

In addition to the landfills detailed in Table 3.1 above, there are a number of permitted and operational waste treatment facilities within the subject waste management regions as included in Appendix A. It should be noted that the facilities included in Appendix A are mainly Composting Facilities (Biological Treatment) primarily for source separated waste (green waste (organic), and brown bin waste) and not residual municipal solid waste (black bin waste).

Exceptions to those facilities are the mechanical treatment facility operated by Mulleady Waste Management, Longford which is a Materials Recovery Facility (MRF) for recyclable waste (green bin waste) and a materials recovery facility operated by Greenstar in Fassaroe, both of which have a licence limit of 10,000TPA composting. In addition, Waterford County Council has permission to compost 1,000TPA within its MRF.

The pre-treatment facilities listed in Appendix A were operational (unless otherwise stated) in 2010. Despite this, approximately 630,911 tonnes of MSW was deposited at landfills in 2010 within the subject waste management regions.

It is noted that Glanpower Limited was granted permission in 2011 for a 75,000 TPA Energy from Waste Facility in Tullamore, Co. Offaly but this facility is not constructed as yet. The facility will be designed to process a combination of municipal solid waste and biomass.

Therefore, there remains a clear requirement within the Kildare, Wicklow, Midlands and South East Waste Management Regions for a facility to treat the municipal solid waste which is currently being disposed of directly to landfill. This hypothesis is tested in the following section which includes a quantitative assessment of the need for the Drehid MBT Facility based on projected growth rates and capacity requirement.

4 CAPACITY NEED ASSESSMENT –WASTE LANDFILLED, WASTE ARISING AND POPULATION STATISTICS

This section (Section 4) forecasts the future waste pre-treatment capacity requirements for the regions based on a number of scenarios and specifically quantifies the need for the proposed Drehid MBT Facility.

As the movement of waste is quite fluid and moreover it is difficult to quantify the actual quantity of municipal solid waste arising in each waste management region, an assessment of the need for the MBT facility has been carried out on the basis of 3 separate scenarios, each of which take into account current pre-treatment capacity and rates of recycling:

- Scenario 1 – Waste projections based on the current volume of waste landfilled in the 4 No. regions;
- Scenario 2 - Waste projections based on the current volume of waste arisings in the 4 No. regions; and,
- Scenario 3 – Waste projections based on a pro-rata estimation of regional waste arisings based on overall national population and waste volumes and regional population statistics.

As a result, the need assessment is considered robust and is not reliant on any one dataset. A summary table of calculations and figures is also included for each scenario.

In order to quantify the future need for the proposed MBT Facility it is necessary in the first instance to estimate the projected quantity of waste which will require treatment in the future. As reported in the EPA National Waste Report 2010, the Economic and Social Research Institute (ESRI) was commissioned by the EPA STRIVE research programme to design and build a Sustainable Development Model for Ireland (ISus) that will forecast national environmental emissions and resource use up to 2025, having regard to economic and social developments. The ISus model is driven by the ESRI's HERMES model, which projects economic production and consumption per sector. The tonnage of future streams of municipal waste is intrinsically linked to the performance of the economy and its ability to move out of recession. Using the ISus model, it is possible to project future tonnages of municipal waste generation for the period up to 2025 depending on the economic recovery possibilities. The ISus model predicts –

"a reduction in the growth rate (-0.8%) in 2011, and a growth rate not exceeding 1% per annum until 2015 and beyond. Using this model, it is anticipated that the total tonnage of municipal waste generated will increase by approximately 825,000 t within the next 15 years.

Of note the ESRI report also includes the following statement:

"While there may be sufficient management capacity in the immediate future, the predicted growth of municipal waste within the coming decade will necessitate investment in waste

management infrastructure."

These growth rates are used to calculate the waste projections for the 3 No. Scenarios.

4.1 Scenario 1 – Waste projections based on the current volume of waste landfilled in the 4 No. regions

This scenario considers the need for facilities such as the proposed Drehid MBT facility based on the current volumes of waste landfilled in the 4 No. waste management regions. In other words, what is the scale of the waste pre-treatment facilities required in order to ensure that landfill diversion targets are met taking into consideration the volume of waste which is currently landfilled in the region.

As with all scenarios future waste projections are based on the ISus model growth rates. The following outlines how this scenario is constructed and should be read in conjunction with Table 4.1 and Figure 4.1.

Using the EPA data presented in Table 3.1 above, approximately 630,911 tonnes of MSW was landfilled in the 4 No. regions in 2010. Based on a 0.8% decrease on the 2010 MSW tonnages during 2011 and a maximum of 1% growth rate thereafter, it is estimated that the MSW tonnages landfilled in the region, in the absence of new treatment facilities, would increase by approximately 87,292 tonnes over the period 2012 to 2025. On this basis an overall total of 719,414 tonnes/annum of MSW would be disposed of directly to landfill within the subject waste management regions by 2025 (with 657,789 tonnes/annum in 2016).

These values are based on the assumption that the current municipal waste recycling rate will remain at 38% as reported in the EPA National Waste Report 2010 where it was stated that *"Ireland's municipal waste recycling rate (excluding energy recovery) is 38%, close to the EU27 norm of 40%"*.

However, the further roll-out of the brown bin to both residential and commercial premises across the country should be considered with respect to future recovery rates. Therefore, in order to provide a more conservative estimate of the volume of MSW that will require treatment in the future, a gradual increase from the current recycling rate of 38% to a rate of 50% by 2016 is used in the needs assessment. This increase is realistic as there are already a significant number of EU countries that have a municipal waste recycling rate of 50% and higher e.g. Belgium, Germany, Switzerland and the Netherlands. The estimated volume of residual MSW remaining, allowing for this gradual increase in the recycling rate to 50%, by 2016 is presented in Table 4.1.

Based on the 2010 EPA determination that 58% of all MSW landfilled comprises BMW (as reported by landfill operators in 2010), the overall BMW estimated in the residual MSW fraction in 2016 is 307,676 tonnes within the subject waste management regions, increasing to 336,500 tonnes/annum by 2025 and beyond.

The proposed Bord na Móna MBT Facility will have the capacity to treat up to 250,000 tonnes/annum of MSW, and assuming that approximately 58% of this incoming waste will be BMW, the Drehid MBT facility therefore has the capacity to divert 145,000 tonnes/annum of BMW from landfill (based on 100% efficiency of the mechanical and biological treatment processes).

Based on the above it is clear that there will be a more than adequate volume of residual MSW, and hence BMW, available for a facility of the scale of the proposed Drehid MBT Facility.

Even after the facility becomes operational, there will still remain a surplus of BMW available for diversion from landfill within the Kildare, Wicklow, Midlands and South Eastern Waste Management Regions. This surplus (following the diversion of the 145,000 tonnes/annum of BMW by the proposed MBT Facility) is estimated to be 162,676 tonnes in 2016, increasing to 191,500 tonnes by 2025, as shown on Table 4.1.

The need assessment can also be considered on the basis of the maximum amount of BMW which will be permitted for disposal to landfill in the future. As outlined in Section 2.4 herein, the EPA requires that a maximum of 47% by weight of MSW accepted for disposal to the landfill body shall comprise BMW from July 1st 2010 to June 30th 2013, 30% from July 1st 2013 to June 30th 2016 and 15% from July 1st 2016. However, these should be considered as maximum allowable limits rather than targets, and over-achievement is desirable in order that as much BMW as possible is diverted from landfill by developments such as the proposed Drehid MBT Facility, and that Ireland strives to:

- achieve the landfill directive targets by surpassing them in some regions in order to compensate for possible under-achievement in others, or (and preferably)
- surpass them state-wide

Nonetheless, using the revised MSW volumes (including for a 50% recycling rate from 2016) and the 2016 maximum limit (i.e. 15% BMW), only a maximum of approximately 87,026 tonnes of waste landfilled in 2025 can comprise BMW (with a BMW limit of 79,571 tonnes in 2016).

Given the above, it is clear that there is a need for the Drehid MBT Facility at the capacity proposed and that the Facility is required as an integral part of the infrastructure necessary to meet the EPA waste pre-treatment guideline limits.

A summary of the waste projections detailed in this section are included in Table 4.1 for the reference years of 2010, 2016 and 2025.

	2010 (t)	2016 (t)	2025 (t)
Estimated MSW landfilled or required to be to landfilled within the 4 Waste Management Regions (WMRs) based on 38% recycling	630,911	657,789	719,414
Original MSW volume (100%)	1,017,598	1,060,950	1,160,345
Revised residual MSW volumes based on current 38% recycling rate rising gradually to 50% in 2016	630,911	530,475	580,173
BMW Estimates (58% of MSW-EPA National Waste Report (2010))	365,928	307,676	336,500
Surplus BMW available for diversion from landfill with the Drehid MBT Facility operational in 2016		162,676	191,500
Estimated maximum tonnage of BMW permitted to landfill within the 4 WMRs. (47% by weight of MSW shall comprise BMW from July 1st 2010 and 15% by weight of MSW shall comprise BMW from July 1st 2016)	296,528	79,571	87,026

Table 4.1: Scenario 1 - Waste Projections based on the volume of waste currently landfilled in the 4 No. Regions

The waste volumes projected based on the estimated volume of MSW landfilled in 2010 in the 4 No. Regions, are also presented schematically in Figure 4.1.

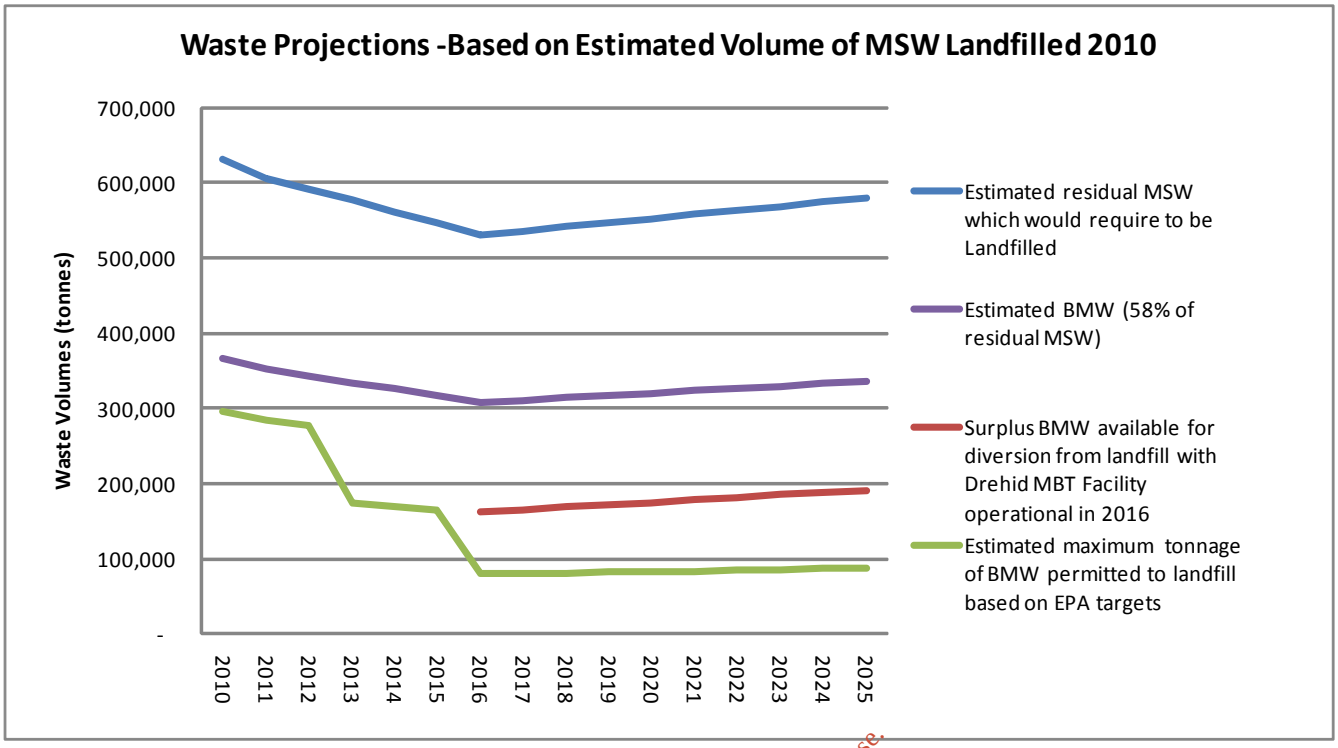

Figure 4.1: Scenario 1 - Waste Projections based on the volume of waste landfilled in the 4 No. Regions in 2010

4.2 Scenario 2 - Need Assessment based on Waste Arisings, Growth Rates and Waste Projections

The previous section assesses the need for the MBT facility on the basis of MSW landfilled in the subject 4 No. waste management regions. The purpose of this section is to assess the need for the Drehid MBT Facility on the basis of the volume of waste arising within each of the subject waste management regions. This assessment is based on the data available from the EPA National Waste Report 2010 (published in February 2012). This assessment is carried out so as to cater for the possibility that the volume of MSW landfilled in the 4 No. waste management regions may be excessive compared to the MSW arising and that in effect there is a migration of waste into landfills within the 4 No. regions.

It should be noted however that one of the difficulties in undertaking this assessment is that there are no waste volumes reported for commercial waste arisings in each of the counties or indeed within individual waste management regions. Data is reported for the household waste arisings in the individual counties in the form of *household waste collected and brought to landfill*. It is therefore necessary, in the first instance, to estimate the volume of commercial waste arising as a pro rata of the household arisings.

Table 4.2, following, details the household waste arisings in each of the counties in the 4 No. regions and the volume of household and commercial waste landfilled as reported in the EPA National Waste Report 2010. As shown, there is an excess of 104,519 tonnes of household

waste landfilled in the 4 subject regions compared to the estimated household waste arising (i.e. 327,077-222,558=104,519).

Therefore, if household waste arising is 32% less than the volume landfilled within the subject waste management regions, and assuming the same ratio applies to commercial waste then we estimate that the quantity of commercial waste arising within the regions is some 202,116 tonnes, based on 297,229 tonnes of commercial waste accepted at landfill.

HOUSEHOLD WASTE COLLECTED AND BROUGHT TO LANDFILL (ARISINGS) AS PER EPA NATIONAL WASTE REPORT 2010			HOUSEHOLD WASTE REPORTED AT LANDFILLS	COMMERCIAL WASTE REPORTED AT LANDFILLS
	Mixed/Residual Collection (Black bins) (t)	Household waste delivered directly to landfill face by householders (t)	Household waste reported at Landfills per Region (based on Table 37 EPA National Waste Report 2010)	Commercial waste reported at Landfills per Region (based on Table 37 EPA National Waste Report 2010)
South East Region				
Carlow	14,498	4,366		
Kilkenny	14,045	1,474		
South Tipperary	13,306	0		
Waterford County	11,278	0		
Waterford City	9,022	0		
Wexford County	25,005	0		
Sub-Total	87,154	5,840	43,369	2,653
Midlands Region				
Laois	12,395	0		
Offaly	10,545	2515		
Longford	6,487	0		
North Tipperary	16,197	1597		
Westmeath	18,004	1038		
Sub-Total	63,628	5150	51,593	53,033
Kildare (Region)	50,197	663	180,448	143,821
Wicklow * (Region)	9,926	0	51,667	97,722
Sub-Total	60,123	663	232,115	241,543
	210,905	**11,653**	**327,077**	**297,229**
Total Household Waste Arising	**222,558**			
Total Household & Commercial Waste Landfilled			**624,306**	

Table 4.2: Household and Commercial Waste Arisings Vs reported Landfilled Waste within the Study Area (2010)

* *Wicklow Result an underestimate as four operators collecting household kerbside waste in 2009 failed to report 2010 data. This value was 21,653 based on 2009 data, a difference of 11,727 - which if included in 2010 data would have added up to 234,285 in total. Therefore calculations of MSW arisings are conservative.*

In summary, based on the ratio used, the breakdown of waste arising within the 4 No. Waste Management Regions is as follows:

Waste Arisings within the 4 No. Waste Management Regions (2010)	Waste Quantities (tonnes)
Reported Household Waste Arising	222,558
Estimated Commercial Waste Arising	202,116
Estimated Total Municipal Solid Waste (MSW) Arising	424,674

Table 4.3: Estimated Municipal Solid Waste Arisings

A revision of Table 4.1 based on waste arising within the 4 No. Waste Management Regions results in the following estimates.

	2010 (t)	2016 (t)	2025 (t)
Estimated MSW arising within the 4 Waste Management Regions (WMRs) based on 38% recycling	424,674	442,766	484,247
Original MSW volume (100%)	684,958	714,139	781,043
Revised residual MSW volumes based on current 38% recycling rate rising gradually to 50% in 2016	424,674	357,069	390,521
BMW Estimates (58% of MSW-EPA National Waste Report (2010))	246,311	207,100	226,502
Surplus BMW available for diversion from landfill with the Drehid MBT Facility operational in 2016		62,100	81,502
Estimated maximum tonnage of BMW permitted to landfill within the 4 WMRs. (47% by weight of MSW shall comprise BMW from July 1st 2010 and 15% by weight of MSW shall comprise BMW from July 1st 2016)	199,597	53,560	58,578

Table 4.4 Scenario 2 -Waste Arisings, Growth Rates and Waste Projections

The waste volumes projected based on the waste arisings within 4 No. Regions, are also presented schematically in Figure 4.2 below.

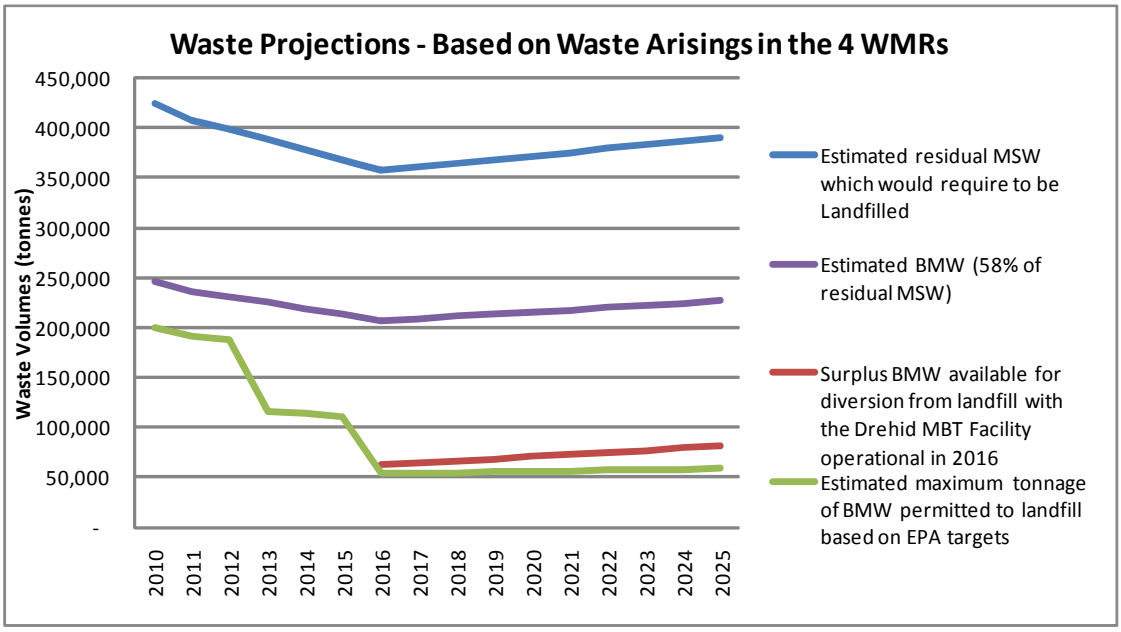

Figure 4.2. : Scenario 2 - Waste Projections based on the volume of waste arising in the 4 No. Regions

Similar to the results of the need assessment based on the MSW volumes accepted at landfill, the assessment on the basis of waste arising within the 4 No. waste management regions (Scenario 2), demonstrates that there is a need for the Drehid MBT Facility at the capacity proposed and that the Facility is required as an integral part of the waste management infrastructure necessary to meet the EPA waste pre-treatment guideline limits.

Furthermore it should be noted that even with the more conservative waste arising volumes, the increased waste recycling rate of 50% and the omission of the additional Wicklow waste volumes, there will still remain a surplus of BMW available for diversion from landfill within the Kildare, Wicklow, Midlands and South Eastern Waste Management Regions notwithstanding the development of the Drehid MBT Facility. This surplus (following the diversion of the 145,000 tonnes/annum of BMW by the proposed MBT Facility) is estimated to be 62,100 tonnes in 2016, increasing to 81,502 by 2025, as shown on Table 4.4.

4.3 Scenario 3 -Need Assessment based on National Waste Volumes, Population Statistics, Growth Rates and Waste Projections

In order to provide additional support for the estimated waste projections, a "sense-check" was carried out by estimating the MSW volume in the 4 No. regions on the basis of population. Specifically the waste volume was estimated on a pro-rata basis using the national annual waste quantities reported by the EPA in the National Waste Report 2010 and the population that contributed to these waste volumes (as reported by the Central Statistics Office based on the 2011 Census) in comparison to the population of the areas included in the 4 No. waste management regions under assessment.

	2010 – National Waste Volumes Reported	Total Population (Rep of Ireland)	Total Population (within the 4 Waste Management Regions)	Estimated Waste Arisings in the subject 4 No. WMRs using Population Ratio
Household	1,686,387	-		439,978
Commercial	1,141,015	-		297,690
Cleansing	18,713	-		4,882
Total Municipal Solid Waste	2,846,115	4,588,252	1,197,262	742,551

Table 4.5: Municipal Waste Generation 2010 (as per EPA National Waste Report 2010)

Using the data above for the national MSW waste estimates for 2010 and the population of the Republic of Ireland and also the population for the four waste management regions as reported in the 2011 Census, the household, commercial and cleansing waste arisings for the 4 No. regions are estimated as presented in Table 4.5 above. As shown, the total municipal waste arising in the 4 No. subject waste management regions, extrapolating from the national figures is estimated to be some 742,551 tonnes.

Assuming a recycling rate of 38% this equates to a residual waste quantity of approximately 460,381 tonnes of MSW arising in the 4 No. waste management regions which requires treatment prior to landfill. Again in order to adopt a conservative approach the rate of recycling is assumed to rise gradually from the current rate of 38% to a potential future waste recycling rate of 50% by 2016. Additionally the waste volumes for 2010 omit approximately 12,000 tonnes of waste from the Wicklow Waste Management Region as they were not reported to the EPA for 2010 – refer to footnote to Table 4.2.

Using the value of 460,381 as the estimated MSW arising within the 4 No. waste management regions (including for 38% recycling) and the growth projections and BMW estimates are as shown in Table 4.6 below.

	2010 (t)	2016 (t)	2025 (t)
Estimated MSW arising within the 4 Waste Management Regions (WMRs) using Population Ratios and National Waste Volumes with 38% Recycling	460,381	479,994	524,963
Original MSW volume (100%)	742,550	774,184	846,714
Revised residual MSW volumes based on current 38% recycling rate rising gradually to 50% in 2016	460,381	387,092	423,357
BMW Estimates (58% of MSW-EPA National Waste Report (2010))	267,021	224,513	245,547
Surplus BMW available for diversion from landfill with the Drehid MBT Facility operational in 2016		79,513	100,547
Estimated maximum tonnage of BMW permitted to landfill within the 4 WMRs. (47% by weight of MSW shall comprise BMW from July 1st 2010 and 15% by weight of MSW shall comprise BMW from July 1st 2016)	216,379	58,064	63,504

Table 4.6: Scenario 3 - Waste projections based population data and national waste arisings.

The waste volumes projected based on the waste arisings and population data within the study area, as detailed in Table 4.6 above, are summarised in Figure 4.3 below.

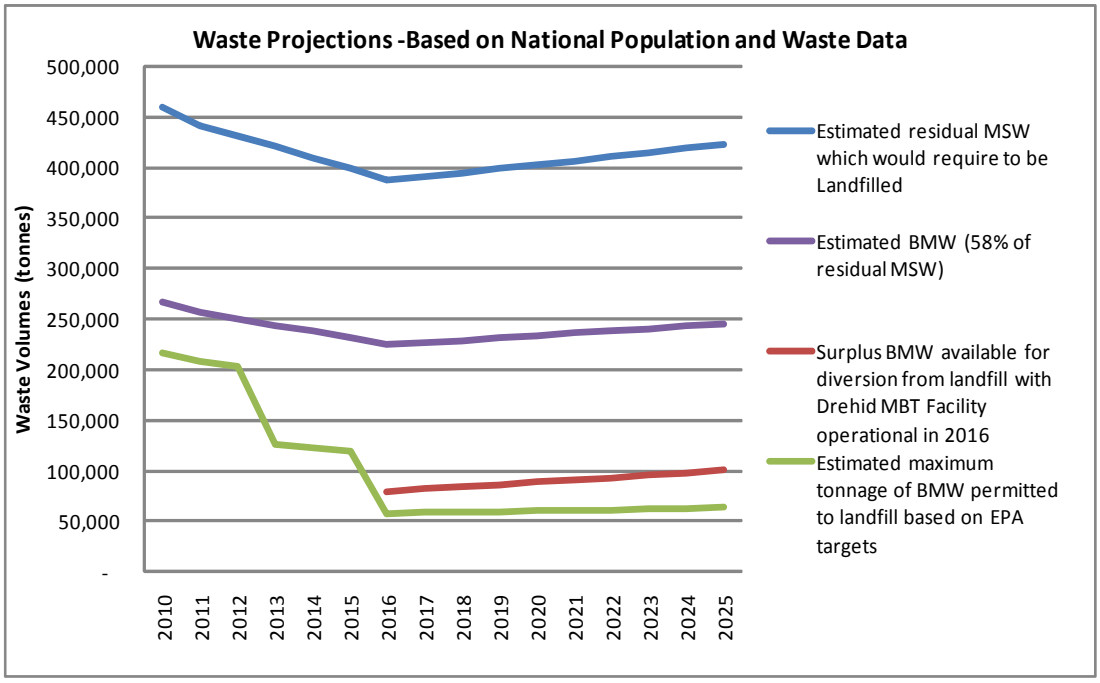

Figure 4.3. : Scenario 3 - Waste projections based on population data and national waste arisings.

Similar to the results of the need assessment based on the MSW volumes accepted at landfill, and waste arising within the 4 No. waste management regions, projected waste volumes based on national waste and population data demonstrates that there is a need for the Drehid MBT Facility at the capacity proposed and that the Facility is required as an integral part of the waste management infrastructure necessary to meet the EPA waste pre-treatment guideline limits.

Again it should be noted that even with the increased waste recycling rate of 50% and the omission of the additional Wicklow waste volumes, there will still remain a surplus of BMW that will require diversion from landfill within the Kildare, Wicklow, Midlands and South Eastern Waste Management Regions notwithstanding the development of the Drehid MBT Facility. This surplus (following the diversion of the 145,000 tonnes/annum of BMW by the proposed MBT Facility) is estimated to be 79,513 tonnes in 2016, increasing to 100,547 tonnes by 2025, as shown on Table 4.6.

5 RENEWABLE ENERGY AND REDUCED ODOUROUS BIOGAS

As detailed in Section 2.3 above, the Waste Hierarchy, as classified within the EU Waste Framework Directive (2008/98/EC), includes recycle and energy recovery which are both proposed as part of the Bord na Móna MBT Facility development.

Dry anaerobic digestion generates biogas from biodegradable waste. The biogas produced is used to produce renewable electricity and heat. The generation of renewable electricity from biogas results in no net increase in greenhouse gas emissions. Given that the production of renewable electricity displaces the production of electricity from fossil fuels, the dry anaerobic digestion step in Configuration B (MBT with Dry Anaerobic Digestion and Composting) will reduce overall carbon dioxide emissions to the atmosphere and the potential impacts of climate change.

Methane is a harmful greenhouse gas if it escapes to atmosphere. The Dry Anaerobic Digestion process will utilise this gas as a fuel, hence eliminating its emission to the atmosphere. The proposed development will therefore assist Ireland in meeting its commitments under the Kyoto protocol and EU Directive 2001/77/EC on electricity from renewable sources.

The biogas from BMW may also cause potential odour problems at landfill and Composting and Dry Anaerobic Digestion processes, producing a biostabilised output which will result in a reduction in the generation of odourous biogas, therefore have a positive social and environmental impact.

6 CONCLUSION

The proposed development of the Bord na Móna MBT Facility is wholly necessary to ensure that the future waste management pre-treatment capacity requirements of the Kildare Waste Management Region, the Wicklow Waste Management Region, the Midlands Waste Management Region and the South East Waste Management Region are provided for.

This finding is supported by the latest EPA National Waste Report (2010) which reported a significant volume of untreated municipal waste disposed of to landfill in 2010. This waste will require pre-treatment in order to meet the EU Landfill Directive Targets by 2016 and specifically to provide for the diversion of BMW from landfill.

This Report examined a number of scenarios to demonstrate the need for the development of an MBT Facility to service the four subject waste management regions with the needs assessment carried out on the basis of 3 separate scenarios, each of which take into account current pre-treatment capacity and rates of recycling:

- Scenario 1 – Waste projections based on the current volume of waste landfilled in the 4 No. regions;
- Scenario 2 - Waste projections based on the current volume of waste arisings in the 4 No. regions; and,
- Scenario 3 – Waste projections based on a pro-rata estimation of regional waste arisings based on overall national population and waste volumes and regional population statistics.

All of the need assessments carried out for the 3 No. scenarios, summarised above, have clearly demonstrated that surplus biodegradable municipal waste (BMW) will exist as a percentage of the overall municipal solid waste within the subject waste management regions by 2016 and beyond and that there is a clear need for waste treatment infrastructure to deal with this waste. The Drehid MBT at 250,000 TPA is also shown to be a conservative capacity to serve the regions.

The need assessment presented herein should also be considered in light of the fact that it is desirable that as much BMW as possible is diverted from landfill and that Ireland strives to:

- achieve the landfill directive targets by surpassing them in some regions in order to compensate for under-achievement in others, or (and preferably)
- surpass them state-wide

Clearly the Drehid MBT Facility will provide a valuable contribution to the achievement of the above objectives.

In addition, a significant volume of waste is also available outside of the boundaries of the four waste management regions and this waste will also need to be diverted from landfill. The waste arising outside of the subject regions may be diverted to other facilities in the future,

such as the Poolbeg Energy from Waste (EfW) Facility, but the proposed Drehid MBT Facility will be well positioned to accept this municipal waste for pre-treatment, if required.

In summary, there is a proven need for the proposed Bord na Móna Drehid MBT Facility in order to contribute to the achievement of Ireland's BMW diversion targets as set by the EU Landfill Directive and to provide a more sustainable solution to the management of increasing volumes of municipal waste within the Kildare Waste Management Region, the Wicklow Waste Management Region, the Midlands Waste Management Region and the South East Waste Management Region.

APPENDIX A:

LIST OF TREATMENT FACILITIES IN THE 4 NO. WASTE MANAGEMENT REGIONS

Facility Type/Name	Waste Management Planning Region	MRF Capacity (TPA)	Permitted Biological Treatment Capacity (TPA)	Comments
Miltown Composting Systems	South East (Fethard, Tipperary)		24,500	W. Licence No. 0270-01
Molaisin Compost Limited	South East (Cappoquin, Waterford)		20,000	W. Licence No. 0245-01 (capacity extension required in 08/10 to allow permitted capacity increase from 12,000 to 20,000t/a.)
Acorn Recycling Limited (Composting)	Midlands (Littleton, Tipperary)		45,000	W. Licence No. 0249-01 (35,000t/a reported in latest Cré report, 2011)
Mulleady Waste Management (Materials Recovery Facility)	Midlands (Drumlish, Longford)	85,000	10,000	W. Licence No. 169-01 95,000 t/a limit for all MRF waste acceptance 10,000 t/a biological treatment approved but not commenced as of May 2012
Bord na Móna Drehid Waste Management Facility (Composting)	Kildare		25,000	W. Licence No. 0201-03 (commenced waste acceptance in 2012)
Bord na Móna Composting (Green Waste) (Kilberry)	Kildare		96,000	W. Licence No. 0198-01
P. Mooney, Maynooth (Composting)	Kildare		2,000	LA Permit
Pat Cleary, Monasterevin (Composting)	Kildare		1,000	LA Permit
Kildangan Stud, Kildare (Composting)	Kildare		n/a	-
Johnstown Recycling, Mullingar (Composting)	Midlands (Westmeath)		2,000	LA Permit
Coolmore Stud, Fethard (Composting)	South East (South Tipp)		10,000	-
CTO Greenclean, Milltown, Cashel (Composting)	South East (South Tipp)		10,000	LA Permit (Applied for Licence to increase to 24,500 –due online in 2014)

Facility Type/Name	Waste Management Planning Region	MRF Capacity (TPA)	Permitted Biological Treatment Capacity (TPA)	Comments
Land Organics (Ormonde Organics Group), Thurles (Land Spreading /no domestic waste)	South East (South Tipp)		-	WP 046/02
O'Toole Composting, Carlow	South East (Carlow)		15,000	LA Permit WP 01/07
Waddock Composting, Carlow	South East (Carlow)		20,000	LA Permit
Waterford County Council, Dungarvan (Materials Recovery Facility and Composting)	South East (Waterford)	23,000	1,000	W. Licence No. 189-01 24,000 maximum annual tonnage to MRF
Mc Gill, Cappoquin (Composting)	South East (Waterford)		12,000	LA Permit
Waterford City Council, Waterford City (Composting)	South East (Waterford)		10,000	EPA Licence Not currently operational due to upgrade but available. W. Licence No. 234-01
Greenstar, Fassaroe (Materials Recovery Facility)	Wicklow	190,000	10,000	W. Licence No. 0053-0, for overall MRF of 200,000 TPA. 10,000 TPA composting approved but not commenced as of May 2012
Glanpower Limited, Energy from Waste Facility (pyrolysis), Biomass and Mixed Municipal Waste	Offaly	75,000		Planning Granted by An Bord Pleanála in July 2011. Facilty not contructed as of May 2012. Combination of Biomass and MSW.
East Coast Recycling	Wicklow		20,000	-
GreenKing Composting (Green Waste)	Wicklow		40,000	W. Licence No. 0218-01
Total		**373,000**	**373,500**	