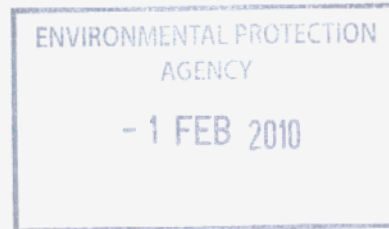


Comhairle Contae Chorcaí Cork County Council

County Hall,
Cork, Ireland.
Tel: (021) 4276891 • Fax: (021) 4276321
Web: www.corkcoco.ie
Halla an Chontae,
Corcaigh, Éire.
Fón: (021) 4276891 • Faics: (021) 4276321
Suíomh Gréasáin: www.corkcoco.ie



Mr. Brian Meaney,
Senior Inspector,
Office of Climate Change, Licensing and Resource Use,
Environmental Protection Agency,
PO Box 3000,
Johnstown Castle Estate,
Co. Wexford.



29th January 2010.

**Re: Waste Licence W0161-01 Bottlehill Landfill:
Submission Regarding Current Review of Waste Licence**

Dear Mr. Meaney,

I refer to your correspondence dated 23/12/2009, regarding notice under section 42(1)(b) of the Waste Management Acts 1996 to 2008 and article 10 of the Waste Management (Licensing) Regulations 2004, initiating a review of Cork County Council Waste Licence register number W0161-01 for a facility at Bottlehill, Tureen South, Coom (Hudson), Coom (Fitzgerald), Glashaboy North, Bottlehill, County Cork. Consequent on receipt of this notification, Cork County Council wishes to make the following submission.

Biodegradable Waste Diversion Targets

I note that reference is made in the correspondence to the newly elaborated limits on the acceptance of biodegradable municipal waste at landfill as published in *Municipal Solid Waste – Pre-treatment and Residuals Management: An EPA Technical Guidance Document* (19 June 2009).

The *Waste Management Plan for Cork County (2004)* is predicated on Scenario 2 of the *Waste Management Strategy for Cork Region (1995)* which presented the methodology for reducing the quantity of waste arising in the Cork Region, and more specifically the quantity of biodegradable waste arising, which is disposed of to landfill. *The Waste Management Plan for Cork County (1999)* implemented the Council's decision to proceed with the waste management strategy formulated in 1995 and this was confirmed by the *Waste Management Plan for Cork County (2004)* and subsequent review (2009). The review also concluded that this strategy would see the Region fulfil its obligations with respect to the 2010 landfill diversion target.

Cork County Council is of the opinion that the allocation of landfill diversion targets as proposed by the Environmental Protection Agency is inequitable and does not take account of both the core principles underlying EU Waste Management Strategy and measures taken within the Cork Region to reduce municipal waste, including the biodegradable fraction,



being disposed of to landfill. Cork County Council's submission in relation to this matter is outlined in **Annex A** to this letter.

Licence Conditions

I also note that the EPA will amend, replace or delete a number of other conditions where this is appropriate and proposes new conditions where these are deemed necessary.

At the time of the Licence application for Bottlehill Landfill in July 2001, baling of waste prior to landfill, a process pioneered in Arthurstown Landfill in Kill, Co. Kildare, was proposed as a method of gaining higher levels of compaction of waste, reducing the risk of fires, windblown litter and scavenging birds on landfills. Accordingly, baling was included in the licence application for Bottlehill Landfill.

The system of Integrated Pollution Prevention and Control (IPPC) licensing came into effect in Ireland in July 2004. The primary aims of IPPC licensing are to prevent or reduce emissions to air, water and land, to reduce waste, and to use energy efficiently. The IPPC system replaced the Integrated Pollution Control (IPC) as the licensing system and most notably among the key technical changes was the switch from Best Available Technology Not Entailing Excessive Costs (BATNEEC) to Best Available Techniques (BAT).

However, since this application, no other landfill operator in Ireland has proposed the use of baling nor has the Agency imposed this condition on any other landfill in Ireland.

It is now apparent that the baling of waste is not best practice in terms of landfill operation and Cork County Council is of the opinion that the option to accept baled or unbaled waste should be at the discretion of the facility operator.

To support the case for the removal of the conditions requiring waste disposed at the Bottlehill landfill to be primarily baled, the Council undertook the following:-

1. Review of Documentation Previously Submitted

The documents reviewed are:

- Waste Licence Application; Residual Landfill at Bottlehill, July 2001.
- Bottlehill Landfill Environmental Impact Statement, submitted with: Application for Waste Licence for Landfill at Bottlehill, July 2001.
- Report to the EPA on the Oral Hearing for the Objections to the Proposed Decision in respect of the Waste Licence Application for a Residual Landfill at Bottlehill, Paul Johnston - November 2003.
- Inspectors Report on: Bottlehill Landfill Licence Application, EPA, 18/11/2004.

In all cases where the baling of waste is addressed in these documents, the relevant extract is quoted. This is followed by an assessment of how the removal of the requirement to bale waste will affect the relevant procedures, equipment, infrastructure or measures proposed. This documentation is **Annex B.1** of the submission.

2. Environment and Engineering Comparison

Cork County Council engaged the services of Fehily Timoney & Co. to examine and compare the acceptance of baled waste and unbaled waste at the facility, and also to clarify the basis for the design of Bottlehill Landfill with regard to the receipt of unbaled waste. This report is attached in **Annex B.2** and the report concludes:

“..The analysis has shown that whilst management practices may need to be altered to accommodate the differing operational requirements, there will be no detrimental environmental impacts as a consequence of introducing transfer and placement of unbaled vs. baled residual waste in Bottlehill as long as best available technology and practices are employed.

The ‘change’ from primarily baled waste would not require any further engineering or infrastructure changes...”

3. Assessment of the existing Licence conditions and proposed amendments to same

Following from the analysis undertaken under items 1 and 2 above, Cork County Council recommends the following amendments be made to Waste Licence W0161-01 for Bottlehill Landfill.

The licence states in the introduction that:

“Waste will be delivered to the site, primarily in baled form,”

It is recommended that the introduction be changed to:

“WASTE WILL BE DELIVERED TO THE SITE, IN BALED OR LOOSE FORM,”

Class 13

Class 13 states:

“Storage prior to submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where the waste concerned is produced.”

“This activity is limited to the temporary storage of baled waste at the baled waste marshalling yard in sealed containers prior to haulage to the working face of the landfill.”

It is recommended that the Class 13 be changed to:

“STORAGE PRIOR TO SUBMISSION TO ANY ACTIVITY REFERRED TO IN A PRECEDING PARAGRAPH OF THIS SCHEDULE, OTHER THAN TEMPORARY STORAGE, PENDING COLLECTION, ON THE PREMISES WHERE THE WASTE CONCERNED IS PRODUCED.”

“THIS ACTIVITY IS LIMITED TO THE TEMPORARY STORAGE OF BALED OR LOOSE WASTE AT THE WASTE MARSHALLING YARD PRIOR TO HAULAGE TO THE WORKING FACE OF THE LANDFILL.”

Condition 1.5.3

Condition 1.5.3 states:

“Only baled residual waste shall be accepted for disposal at the facility. Notwithstanding, in exceptional circumstances, particular wastes, where baling is not technically feasible, may also be accepted for disposal at the facility, subject to agreement by the Agency.”

It is recommended that the Condition 1.5.3 be changed to:

“ONLY RESIDUAL WASTE SHALL BE ACCEPTED FOR DISPOSAL AT THE FACILITY.”

Condition 5.5.1

Condition 5.5.1 states:

“Unless the prior agreement of the Agency is given, the following shall apply at the landfill:

- a) Only one working face shall exist at the landfill at any one time for the deposit of baled waste other than the deposit of cover or restoration materials;**
- b) Prior to the commencement of waste activities the licensee shall submit a report to the Agency for its agreement as to the size of the working face for the deposit of baled waste;.....”**

It is recommended that the Condition 5.5.1 be changed to:

“UNLESS THE PRIOR AGREEMENT OF THE AGENCY IS GIVEN, THE FOLLOWING SHALL APPLY AT THE LANDFILL:

- A) ONLY ONE WORKING FACE SHALL EXIST AT THE LANDFILL AT ANY ONE TIME FOR THE DEPOSIT OF WASTE OTHER THAN THE DEPOSIT OF COVER OR RESTORATION MATERIALS UNLESS OTHERWISE AGREED WITH THE AGENCY;**
- B) PRIOR TO THE COMMENCEMENT OF WASTE ACTIVITIES THE LICENSEE SHALL SUBMIT A REPORT TO THE AGENCY FOR ITS AGREEMENT AS TO THE SIZE OF THE WORKING FACE FOR THE DEPOSIT OF WASTE;.....”**

SCHEDULE G: Content of the Annual Environmental Report

Schedule G states:

“.....Waste activities carried out at the facility. Quantity and composition of waste received, disposed of and recovered during the reporting period and each previous year including the quantity of waste accepted in baled form.....”

It is recommended that the Schedule G be changed to:

“.....WASTE ACTIVITIES CARRIED OUT AT THE FACILITY. QUANTITY AND COMPOSITION OF WASTE RECEIVED, DISPOSED OF AND RECOVERED DURING THE REPORTING PERIOD AND EACH PREVIOUS YEAR INCLUDING THE QUANTITY OF WASTE ACCEPTED”

Cork County Council requests that this submission be considered as part of the review process.

Should you have any queries regarding this submission, please do not hesitate to contact Liam Singleton, Senior Engineer at 021-4285286.

Yours sincerely,



Louis Duffy,
Director of Services,
Environment & Emergency Services,
Cork County Council.

For inspection purposes only.
Consent of copyright owner required for any other use.



Comhairle Contae Chorcaí

submission in relation to

**Bottlehill Landfill
Waste Licence Review**

Annex A

Waste Licence
Register Number: W0161-01
Licensee: Cork County Council
Location of Facility: Bottlehill Landfill, Treen South, Coom (Hudson),
Coom (Fitzgerald), Glashboy North, Bottlehill, Co.
Cork.

Table of Contents

1.0	Introduction.....	2
2.0	Meeting the Landfill Diversion Targets.....	2
2.1	Calculating Landfill Diversion Targets for the Cork Region	2
2.2	Waste Diversion Initiatives	4
3.0	Obligations on Landfill Operator relating to Monitoring of Waste	8
4.0	Conclusions.....	9
	Appendix A.....	10
	Appendix B.....	13

1.0 Introduction

The *Waste Management Plan for Cork County (2004)* is predicated on Scenario 2 of the *Waste Management Strategy for Cork Region (1995)* which presented the methodology for reducing the quantity of waste arising in the Cork Region, and more specifically the quantity of biodegradable waste arising, which is disposed of to landfill. *The Waste Management Plan for Cork County (1999)* implemented the council's decision to proceed with the waste management strategy formulated in 1995 and this was confirmed by the *Waste Management Plan for Cork County (2004)* and subsequent review (2009). The review also concluded that this strategy would see the Region fulfil its obligations with respect to the 2010 landfill diversion target.

Cork County Council is of the opinion that the allocation of landfill diversion targets as proposed by the Environmental Protection Agency is inequitable and fails to take account of both the core principles underlying EU Waste Management Strategy and measures taken within the Cork Region to reduce municipal waste, including the biodegradable fraction, being disposed of to landfill. These contentions are discussed in detail in Section 2.0 below.

In addition the council submit in Section 3.0 that the inclusion of a protocol for the evaluation of stabilised biodegradable municipal waste sent to the facility similar to that included in the Proposed Decision for Youghal Landfill (W0068-03) would place an excessive and unnecessary burden on the landfill operator in terms of compliance testing.

2.0 Meeting the Landfill Diversion Targets

The EPA technical guidance document *Municipal Solid Waste – Pre-treatment & Residuals Management* and more specifically the maximum allowable biodegradable content of municipal solid waste (MSW) disposed of to landfill stipulated therein is not only a blunt instrument, as acknowledged by a Senior Scientific Officer (EPA) at the EPA Waste Workshop 2009 Athlone, but is also a wholly inequitable proposition. In addition it disregards two of the core principles of European Waste Strategy, namely the **Polluter Pays Principle** and the **Producer Responsibility Principle**, which seek to ensure that the responsibility and costs of waste generation and consumption are assigned to those who generate the waste. In doing so the targets **fail** to take account of:

- Each Region's contribution to the total BMW landfilled nationally on an annual basis (Section 2.1).
- Measures implemented by Regions to reduce MSW arisings (Section 2.2).

2.1 Calculating Landfill Diversion Targets for the Cork Region

The methodology used in *Municipal Solid Waste – Pre-treatment & Residuals Management* for both the calculation of landfill diversion targets and their allocation to landfills licensed by the authority does not encompass any weighting element to take cognisance of the polluter pays and producer responsibility principles thus placing an iniquitous burden on the Cork Region among others.

In July 2008 RPS Consulting Engineers were appointed by Cork County Council to procure an Interim Waste Processing Service Contract to enable Cork County and City Councils to meet their respective obligations regarding pre-treatment. As an integral part of it's brief RPS were tasked with calculating the Cork Region's obligations under the Landfill Directive (1999/31/EC) based on the Region's contribution to the total biodegradable municipal waste (BMW) landfilled¹ nationally in 1995 (Appendix A) - an approach consistent with the **Principle of Subsidiarity** as advocated by the EU.

The methodology applied by RPS follows that adopted by DEFRA (<http://www.defra.gov.uk/Environment/waste/localauth/lats/intro.htm>) to calculate the landfill allowance trading scheme (LATS) established to enable the UK to comply with its diversion targets (Appendix A) and apportions landfill allowances to each waste disposal authority using their relative share for disposal in 1995 as the base years (1 allowance = 1 tonne BMW).

Table 1.0 and 2.0 below present the landfill diversion requirements for the Cork Region for 2010 as calculated using both the RPS methodology and EPA methodology, respectively, and serve to emphasise the inequity of the targets being imposed on the Cork Region by the Agency through the landfill licensing process.

Table 1.0 2010 Diversion requirement for Cork Region based on RPS Method.

Description	Ireland (t)	Cork Region (t)
Total Waste Arising in 1995	1,848,232	267,371
Baseline BMW generation	1,289,911	186,603
BMW permitted to landfill in 2010²	967,433	139,952
BMW originating in Cork Region and destined for landfill in 2008 ³		145,218
Projected BMW originating in Cork Region and destined for landfill in 2010 ⁴		153,812
Projected BMW diversion requirement for 2010		13,860

¹ It should be noted that Article 5 (2) of the Landfill Directive (1999/31/EC) states that "biodegradable waste going to landfill must be reduced toof the total amount (by weight)....**produced** in 1995". Therefore as the analysis undertaken by RPS Consulting Engineers for Cork County Council related to municipal solid waste (MSW) landfilled rather than produced in 1995 the target outlined in Figure 1 above is regarded as conservative.

² Appendix A.

³ From ARs received and collated by Cork County Council in 2009. Not all of this BMW was landfilled in Cork Region but it was generated within the Region.

⁴ Projected from ARs received and collated by Cork County Council in 2009. This does not take into account the affect of the introduction of the brown bin and the implementation of the Waste Management (Food Waste) Regulations on the BMW content of MRW arisings.

Table 2.0 2010 Diversion requirement for Cork Region based on EPA Pre-treatment Document.

Description	Quantity (t)
Projected MSW destined for landfill originating in Cork Region in 2010 ⁴	212,441
Projected BMW destined for landfill ⁴	153,812
Projected non-BMW destined for landfill ⁴	58,629
Projected BMW removed through mechanical treatment ⁵	56,085
Projected stabilised BMW destined for landfill following mechanical treatment ^{6,7}	28,043
BMW permitted to landfill⁸	57,781
Projected BMW diversion requirement for 2010	96,031

It should also be considered that the Cork Region contains 11.4% of the national population. By applying this weightings to the 57,781t of BMW permitted to landfill in 2010 (as stipulated under the pre-treatment document – Table 2.0) it follows that the national target should be of the order of 506,8501t as opposed to 967,433t (Figure 1.0). In other words the BMW diversion target being imposed on the Cork Region is not in proportion to the Region’s share of the national population, and by extrapolation the Region’s contribution to BMW being landfilled nationally.

The National Waste Report 2008 (EPA, 2009) presents “the most up to date information available on waste generation and management in Ireland”. Table 3.0 below compares waste statistics compiled by Cork County Council from Annual Returns (ARs) received in 2009 (which were audited by the EPA) with data obtained from this report and highlights that the Cork Region was responsible for only 11% of the MSW landfilled nationally and 12% of the BMW landfilled nationally – a fact ignored by the EPA in the apportioning of BMW thresholds to landfills.

Table 3.0 MSW and BMW arising nationally and in the Cork Region which was destined to landfill in 2008 (Cork County Council and EPA, 2009)

Description	Ireland	Cork Region	
	Quantity (t)	Quantity (t)	% of National Total
MSW landfilled in 2008	938,712	205,581	11%
BMW landfilled in 2008	1,196,044	145,218	12%

2.2 Waste Diversion Initiatives

The *Review of Waste Management Plan for Cork County (2004)* found that while the total domestic municipal solid waste (MSW) collected increased from 99,318t in 2002 to 110,409t in 2007 the waste arising per household decreased from 0.94t to 0.88t. Of the domestic MSW arising in 2007, 56,799t was disposed of to landfill. In addition, the *Review of Waste Management Plan for Cork County (2004)* reported that there was a reduction in the commercial municipal waste arisings from 267,366t in 2006 to 252,659t in 2007, 112,235t of

⁵ Includes both commercial and domestic and assumes 40% separation 66% of which is diverted.

⁶ Assume 50% moisture.

⁷ Must consider the implications of a levy on the gate fee for stabilised material.

⁸ Assume that all non-BMW and stabilised BMW (i.e. 86,672t in total) goes to landfill in Cork Region for the purpose of this exercise (Condition 5.2.11 of licence). This equates to 60% of MSW going to landfill (the other 40% being the permitted BMW).

which was landfilled⁹. These reductions were achieved as a result of a number of regulatory and awareness initiatives implemented by Cork County Council including:

Separate Kerbside Collection of Household Waste

The separate kerbside collection of domestic mixed residual waste (MRW) and mixed dry recyclables (MDR) has been in operation across the entire functional area of Cork County Council since the end of 2007. This measure alone has resulted in an estimated 19,346t of MRW being diverted from landfill in 2008, the latest year for which statistics are available.

Pay by Use

The government policy document *Preventing and Recycling Waste: Delivering Change (2002)* recognised that waste charges should be based on usage i.e. *polluter-pays principle*. This was further emphasised in the subsequent policy document *Waste Management: Taking Stock and Moving Forward (April 2004)*. All domestic waste collectors in the Cork Region operate one of two charging systems, namely pay-by weight or pay-by-volume. The former incorporates a flat annual charge supplemented by a set charge per kilogram of MRW collected and has been introduced by the council and two of nine private operators - the other private operators charge a set rate dependent on the volume of wheelie bin supplied.

Detailed analysis of the ARs for 2008 showed that on average 1.01t of MSW was collected per household annually under the pay-by-volume regime while on average 0.80t was collected under the pay-by-weight regime. This equates to a 21% reduction in domestic waste collected under the pay-by-weight regime compared with the pay-by-volume regime. It was also noted that the quantity of MDR collected annually under both charging regimes was similar with 0.25t/household on average collected under the pay-by-weight regime and 0.26t/household on average under the pay-by-volume regime. It appears, therefore, that the pay-by-weight regime is a more complete interpretation of the polluter-pays-principle and provides the greater incentive for reducing domestic waste arisings and more importantly diverting waste being disposed of to landfill. In addition research undertaken by the Southern Division of Cork County Council found that a lower level of contamination of MDR is experienced under the pay-by-weight regime.

Civic Amenity Sites and Bring Banks

Cork County Council currently operate a network of nine Civic Amenity Sites (CAS). A further two sites have just been completed and it is envisaged that they will be operational in 2010. The CAS accept the following waste types: paper and cardboard, glass, aluminium cans, textiles, timber, plastic packaging, batteries, cooking oil, motoring oil, waste electrical and electronic equipment (WEEE), green waste and scrap metal while some facilities are also licensed to accept domestic MRW. In addition the council operate an open windrow composting system at the CAS in Bandon.

The council also provides 157 bring banks (BBs) – the largest number provided by any local authority – and these are located throughout the county. In 2008, the latest year for which

⁹ Due to the nature of commercial waste collection and the method by which it is reported in the Annual Returns (ARs) it was not possible to distinguish between waste arisings in Cork County Councils functional area and that arising in Cork City Council's functional area so figures quoted are for the Cork Region as a whole.

statistics are available, CAS and BBs were jointly responsible for the diversion of 25,987t of waste from landfill, 9,070t of which was classified as BMW.

Home Composting

Cork County Council initiated a scheme in 2004 aimed at promoting the diversion of organic waste from landfill. Under this scheme 6,652 compost bins were sold to members of the greater public at a subsidised rate. When it is considered that the average household composts 200kg of green waste per annum (*Mr. Olivier Gaillot, RPS Consulting Engineers*) this suggests that in the region of 1,330t of BMW waste is diverted from landfill annually as a result of this scheme. This is a very conservative estimate of organic waste being diverted in the Cork Region as it does not take account of the numerous compost bins sold through the network of hardware shops, DIY shops and garden centres located throughout Cork County.

Environmental Awareness and Research Unit

Waste prevention activities fall under the remit of the *Environmental Awareness and Research Unit* of Cork County Council which was established in 2005. This unit is charged with developing an environmental awareness plan for Cork County and to this end it has developed a strategic policy based on the council's *Strategic and Corporate Plan, Waste Management Plan and Litter Plan* and the *Environment and Emergency Directorate's Operational Plan*. Central to this policy are preventative initiatives and associated public awareness programmes, both underpinned by environmental research. Among the more successful programmes implemented by the unit are:

Green Flag Scheme

Currently 197 schools are registered with the Green Flag programme, 71 of which have been awarded Green Flags. The aim of the scheme is to raise environmental awareness among school children through various workshops and recycling and on-site composting initiatives. Pilot summer programmes on environmental education have also been established for teachers & youth/community leaders while environmental education programmes have also been developed with other agencies e.g. the Education Unit at Fota Wildlife Park. In addition, the council supplied free compost bins to all schools participating in the Green Flag scheme.

Green Fáilte Award for Hotels

The Green Fáilte Award Scheme is aimed at promoting sustainability across the hotel sector by assisting in the reduction waste production in addition to energy and water usage. It was run as a 3 year pilot programme which has now come to a successful conclusion and is about to be rolled out on a national basis. The programme is now called the Green Hospitality Award and the EPA is the primary sponsor. Cork County Council continue to promote and support this programme and there are currently 38 participants of this scheme in Cork, 19 of which have received award recognition.

Waste Prevention Officer

In 2009 Cork County Council received partial funding from the EPA under the Local Authority Prevention Network (LAPN) to support the creation of the post of Waste Prevention Officer (WPO) with responsibility for raising awareness on waste prevention among small and medium enterprises (SMEs) in the East and South Cork Area (SECAD). The WPO is also charged with ensuring that SMEs are familiar with their

statutory obligations under the Waste Management Acts, 1996-2008 and assisting them with any related queries. One of the main objectives of the WPO is thus to roll out an education and awareness programme relating to the implementation of the proposed Waste Management (Food Waste) Regulations which aim to reduce the BMW being disposed of to landfill from 9 classes of activity. This is on-going and is being addressed through the:-

- ✓ Distribution of information leaflets;
- ✓ Provision of workshops for food waste producers and collectors (Appendix B);
- ✓ Provision of support to potential operators of treatment facilities for food waste.

Waste Enforcement Team

A multi-disciplinary waste enforcement team consisting of engineers, scientists, and administration staff was established by Cork County Council in 2006. In summary the waste enforcement team is charged with policing waste activities, both legal and illegal, throughout Cork County Councils functional area and prosecuting breaches in legislation where they occur. Listed among the teams responsibilities which are of relevance to this submission are:

Promoting producer responsibility initiatives through the implementation of the Packaging Regulations

The Waste Enforcement Team is charged with enforcing the *Waste Management (Packaging) Regulations, 2007 (S.I. No. 798 of 2007)*. Under these regulations there is a prohibition on packaging waste producers to dispose of specified packaging waste and an onus on producers to achieve specified recycling targets or register with an approved body i.e. Repak. In 2008 an estimated 88,825t of commercial BMW was diverted from landfill in the Cork Region the majority of which consisted of paper and cardboard.

Ensuring timely submission of annual returns (ARs) from permit holders

On a more strategic level the Waste Enforcement Team are responsible for ensuring the timely submission of Annual Returns (ARs) by permitted waste collectors. ARs contain, *inter alia*, data describing the type and quantity of waste collected throughout the Cork Region for the preceding year. These data are essential to strategic waste management decision making. The Waste Enforcement Team assumed responsibility for this task in 2007 and in that year achieved an 86% return rate for ARs. This was exceeded in 2008 when a 96% return rate was recorded. The collated data is available to senior management to inform decisions on waste infrastructural investment for the Region. It also allows the council to determine, on an annual basis, the Region's status with respect to the landfill diversion targets (Section 2.1) using best available data and to implement any corrective measures that may be necessary to keep the Region on course to meet its obligations.

In summary, initiatives successfully implemented by both Cork County Council and Cork City Council under the Waste Management Strategy for Cork Region (1995) and their respective Waste Management Plans of 1999 and 2004 have, by 2009, facilitated the diversion of at least 118,571t of BMW from landfill annually in the Cork Region.

3.0 Obligations on Landfill Operator relating to Monitoring of Waste

This section reviews the implications of the *Draft Protocol for the Evaluation of Biodegradable Municipal Waste Sent to Landfill by Pre-treatment Facilities* for Bottlehill Landfill in the context of the recent Proposed Decision (PD) issued for Youghal Landfill (W0068-03).

Condition 5.2.14 of the PD for Youghal states the "Bio-stabilised residual wastes shall be monitored in accordance with Schedule D.8: Waste Monitoring, of this licence". [Schedule D.8 specifies the frequency of testing as every 200 tonnes from each source and the relevant parameter as respiration activity after 4 days, i.e. AT4]. The definition of "monitored" holds huge significance in terms of the obligations that will be placed on the council as a landfill operator.

Annex II of the Landfill Directive (1999/31/EC) specifies the general testing of waste must be based on the following three-level hierarchy:

- Level 1: Basic Characterisation. This constitutes a thorough determination, according to standardised analysis and behaviour-testing methods, of the short and long-term leaching behaviour and/or characteristic properties of the waste.
- Level 2: Compliance Testing. This constitutes periodical testing by simpler standardised analysis and behaviour-testing methods to determine whether a waste complies with permit conditions and/or specific reference criteria. The tests focus on key variables and behaviour identified by basic characterisation.
- Level 3: On-site Verification. This constitutes rapid check methods to confirm that a waste is the same as that which has been subjected to compliance testing and that which is described in the accompanying documents. It may merely consist of a visual inspection of a load of waste before and after unloading at the landfill site.

Council Decision of 19th December 2002 establishes criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 of and Annex II to Directive 1999/31/EC and in doing so lays down the uniform waste classification and acceptance procedure according to Annex II to Directive 1999/31/EC. When the *Draft Protocol for the Evaluation of Biodegradable Municipal Waste Sent to Landfill by Pre-treatment Facilities* is reviewed in this context it suggests that the tests specified there-in for waste pre-treatment facilities would be described as either Level 1 or Level 2 tests. It follows, therefore, that only Level 3 tests are necessary at the landfill gate. However, while the draft protocol specifies that waste surveys be carried out at the treatment facility at a minimum every quarter or 5,000 tonnes of residual waste sent to landfill (for stabilised residual waste unlikely to meet EPA standard) and every 200 tonnes (for stabilised residual waste likely to meet EPA standard) the PD for Youghal Landfill also specifies testing every 200 tonnes of bio-stabilised residual waste received at the landfill¹⁰. Thus the testing obligations being

¹⁰ It should be noted that the draft protocol does refer to this fleetingly in the introduction by stating that "landfill operators may designate the responsibility for testing to demonstrate compliance with licence requirements to the pre-treatment facilities". However this point is not developed further within the document.

placed on Cork County Council appear closer to compliance testing than on-site verification. When it is considered that, at full capacity, Bottlehill is licensed to accept 183,500t of MSW per annum this condition would necessitate 367 tests annually for the 2010 to 2013 window based on the EPA limit of 40%.

4.0 Conclusions

The Landfill Directive has been in existence since 1999 and the Cork Region took initial measures to address its obligation under what was then a draft Directive as far back as 1995 with the compilation of the *Waste Management Strategy for Cork Region*. These measures have been advanced through the Waste Management Plans produced for the Cork Region to date and involved, *inter alia*, considerable investment in infrastructure and awareness and enforcement programmes all of which is now being undermined by the inequitable BMW targets stipulated by the EPA. Moreover these measures have been very effective to date contributing to the diversion of approximately 118,571t of BMW from landfill annually.

In practice the methodology applied by the EPA in the calculation of the limits on acceptance of biodegradable municipal waste does not take account of the contribution of each Region to waste landfilled annually. This lack of weighting leads to an *unfair burden being imposed* on the Cork Region and, in quantitative terms, equates to an excess diversion requirement of approximately 82,000t.

The waste management strategy adopted by Cork County Council assigns responsibility for waste generation and disposal as close to source as feasible and is thus consistent with the subsidiarity, proximity and polluter pays principles. The prevention principle and producer responsibility principle also form a core tenet of waste management strategy for the Region. However, the limit of acceptance of biodegradable municipal waste specified by the EPA does not take into account the upstream measures that have been implemented to reduce waste going to landfill. These measures also result in a reduction in the non-BMW content of MSW going to landfill in the Region and it must thus be considered that a scenario could arise, most probably at a local level, whereby the content of BMW going to landfill during the 2010 to 2013 period could be greater than the 40% specified by the EPA yet the Landfill Directive diversion target would be achieved.

In summary, the targets as presented in the EPA pre-treatment document bear no relationship to the BMW diversion targets stipulated in the Landfill Directive which have been converted to specified targets for the country, i.e. 967,433t in 2010, 644,956t in 2013 and 451,469t in 2016 and a specified allowance, i.e. tonnage of BMW permitted per year, based on waste arisings in each Region would thus be a more conducive approach.

With respect to the inclusion of a licence condition relating to the evaluation of stabilised biodegradable municipal waste received at the facility it is the opinion of Cork County Council that the Agency should take cognisance of Annex II to Directive 1999/31/EC and refrain from placing excessive and unnecessary obligations on the facility operator.

Appendix A

*For inspection purposes only.
Consent of copyright owner required for any other use.*

Calculation of BMW diversion requirement for the Cork Region(t)

	2008	2010	2013	2016
MSW arising (t)¹	413,299	425,899	452,055	480,355
MDR arising (t)	179,522	184,581	195,705	207,833
MRW arising (t)	205,581	212,441	225,811	240,127
Other (t)	28,196	28,877	30,539	32,395
BMW content of MRW arising (t)²	145,218	153,812	163,368	173,656
BMW permitted to landfill (t)³	N/A	139,952	93,301	65,311
Gap (t)	N/A	13,860	70,067	108,345
BMW diverted through Mechanical Treatment (t)⁴	N/A	50,986	54,195	57,630
BMW diversion requirement (t)⁵	N/A	-37,126	15,872	50,715

1 Calculated from ARs submitted by authorised collectors and projections for future waste arisings supplied by RPS Consulting Engineers.

2 BMW calculated as 76.4% and 57.5% of domestic MRW for city and county, respectively, and 80% of commercial MRW (RPS Consulting Engineers).

3 BMW landfill diversion targets apportioned based on the relative share of each local authority for MSW disposal in 1995.

4 Includes both commercial and domestic and assumes 40% separation 66% of which is diverted.

5 This does not consider MRW currently undergoing mechanical treatment.

FUTURE BIODEGRADABLE WASTE MANAGEMENT IN THE CORK REGION

In order to assess the contribution of the proposed facility to the Landfill Diversion Targets, it was necessary to predict future BMW arisings and examine the impact of the implementation of proposed national and regional policy.

The biodegradable content of MSW in 2007/2008 was calculated using waste compositional information and is estimated to be 77.5%. This is an increase from 68% in 1995 but is in line with the biodegradable content of 73% presented in the EPA National Waste Report 2007.

For the purposes of calculating a Landfill Directive Target for this report, and hence the amount of BMW allowed to be disposed of to landfill by the Cork Region, the BMW content was derived from the EPA 2001 National Waste Database total 1995 MSW arisings figure for Ireland (1,848,232) and the 1995 National BMW content from the DOEHLG (1,289,911) thereby giving a BMW content of 69.8%. It must be noted this calculation is in line with the UK calculation method.

The BMW content calculated was applied to this figure resulting in the baseline BMW figure to be used to calculate target diversion rates of 25%, 50% and 65% respectively.

		Ireland	Cork
1995	Total Waste Arisings	1,848,232	267,371
	(Baseline BMW generation)	1,289,911	186,603
Year	Target	BMW tonnes allowed in landfill	
2010	75%	967,423	139,952
2013	50%	644,956	93,301
2016	35%	451,469	65,311

For inspection purposes only.
Consent of copyright owner required for any other use.

Appendix B

*For inspection purposes only.
Consent of copyright owner required for any other use.*

For European Week for Waste Reduction
Cork County Council and South & East Cork Area Development Presents

REDUCE WASTE, REDUCE COSTS.

Waste Prevention Opportunities Work Shop For Businesses
in the Catering and Hospitality Sector

Tuesday 24 November 2009, 9.30am – 11.00am
Midleton Park Hotel, Midleton, Co Cork

Introduction

Faced with tightening profit margins, businesses are constantly looking for ways to cut their costs. Reducing your waste through simple waste prevention procedures goes hand in hand with reducing operation costs. Savings can be realised through waste prevention, water conservation & energy efficiency. This short focused workshop will provide information on how to improve environmental performance and reduce associated costs. Also advice will be provided on how to ensure legal compliance with impending food waste regulations, which will impact on all businesses where food waste is produced. The workshop is targeted at Businesses in the Catering and Accommodation Sector (including hotels, bars, restaurants, supermarkets, nursing homes, and catering facilities in business/industry etc)

Is there a charge?

Attendance is free. Cork County Council Local Authority Prevention Network Programme, supported by SECAD, is hosting this event and is funded by the Environmental Protection Agency National Waste Prevention Programme.

Further Information & Booking

Please register for this event by returning completed fax overleaf or by sending your name & contact details to acobusiness@secad.ie or by phoning Claire on 021 4613432 by Thursday 19 November 2009. Places are limited so please register early.



REDUCE WASTE, REDUCE COSTS.

Event Schedule

09:30	Registration – Tea/Coffee	
09:40	Welcome Address	Ryan Howard CEO SECAD
09:45	An Overview of the proposed Waste Management (Food Waste) Regulations This presentation will inform you of your obligations in relation to food waste when the regulations come into effect. Guidance will be given on how you can prepare to ensure compliance.	Claire Kelly Executive Engineer Cork County Council
10:00	Managing Waste, Managing your Costs – Experiences from the Clean Technology Centre This presentation will give the background to the Green Hospitality Awards Scheme and its benefits. Specific examples of cost savings through areas of waste, water and energy in the hospitality/catering sector will be included. James Hogan will also provide information on the new EPA booklet, Managing Food Waste.	James Hogan Environmental Consultant Clean Technology Centre
10:30	Wastematchers An overview of the online waste exchange service for businesses	Catherine Costello, Macroom-E
10:45	Q & A	

James Hogan has been an Environmental Consultant and Researcher with the Clean Technology Centre, based at CIT since 1998. His areas of expertise include; Environmental Management Systems, Waste Auditing, Cleaner Production, Energy Efficiency. James has worked with a range of industry and commerce from large multinationals to the corner grocer shop. He was instrumental in setting up the Green Hospitality Award for hospitality businesses which has saved the sector millions of euros in reduced utility costs. James is now resident in Middleton.

Registration Form

Name: _____

Organisation: _____

Phone: _____ email address: _____

Please fax form to 021 4613808

Or return by post to
SECAD
Middleton Community Enterprise Centre
Knockgriffin
Middleton
Co Cork

ANNEX B.1

Review of Documentation Previously Submitted

- **Waste Licence Application; Residual Landfill at Bottlehill, July 2001.**
- **Bottlehill Landfill Environmental Impact Statement, submitted with: Application for Waste Licence for Landfill at Bottlehill, July 2001.**
- **Report to the EPA on the Oral Hearing for the Objections to the Proposed Decision in respect of the Waste Licence Application for a Residual Landfill at Bottlehill, Paul Johnston - November 2003.**
- **Inspectors Report on: Bottlehill Landfill Licence Application EPA, 18/11/2004.**

**Extracts from:
Waste Licence Application
Residual Landfill at Bottlehill
July 2001**

Box 1 (page 1)

Attachment A – Non Technical Summary

Article 12(1) (e)

The landfill site will also include the ancillary infrastructure such as site entrances, site roads, administration building, maintenance shed, reception kiosk, weighbridges, wheel wash, baled waste marshalling area, waste quarantine and inspection areas, leachate holding tanks etc.

Comment:

This quote is a basic reference to the construction of a marshalling yard for temporary storage of baled waste.

The baled waste marshalling yard was constructed as part of the specified engineering works at the Landfill Facility. The marshalling yard consists of a concrete hard standing area approximately 1,750 square meters in area. The original function of this area was to create an area for the delivery of baled waste in containers. The enclosed containers would be delivered to this area by the road going vehicles. Site vehicles would then bring the containers of waste to the working face of the Landfill. This may continue to be the case, the only difference being the waste in the enclosed vehicles would be loose rather than baled. Alternatively, road going vehicles can bring waste directly to the working face of the Landfill. Adequate wheel cleaning facilities are in place to allow this practice to take place. In all cases, waste will be transported to the working face Landfill in enclosed vehicles. The current proposal for the acceptance of primarily unbaled waste will not change the method of delivery of waste to the facility. Waste will be delivered in specialised fully enclosed vehicles.

Box 2 (page 3)

Attachment A – Non Technical Summary

(f) Third Schedule, Class 13: 'Storage prior' to 'submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where the waste concerned is produced.'

The application includes for the temporary storage of baled waste at the baled waste marshalling yard in sealed containers prior to haulage by off road haulage trucks to the working face of the landfill.

Comment:

See comment for Box 1

Box 3 (page 6)

Attachment A – Non Technical Summary

(i) The working faces of the landfill will also be limited to a maximum of approximately 40m by 40m for unbaled waste and 30m by 30m for baled waste.

The landfill site will also include the ancillary infrastructure such as new site entrances, new site roads, administration building, maintenance shed, reception kiosk, weighbridges, wheelwash, baled waste marshalling area, waste quarantine and inspection areas, leachate holding tanks, surface water lagoons.

On average it is estimated that 85,000tpa of residual waste will be hauled to the landfill from the waste recovery facility in a baled form when the waste recovery facility is at a capacity of 225,000tpa. It is envisaged that further baling capacity for an additional 50,000 tonnes per annum will be provided at this or alternative baling facilities in the short term i.e. by 2007. A further 50,000 tonnes per annum baling capacity will be provided by the year 2012. The remainder of the waste will be hauled to the landfill in a loose format via HCV's at an average weight of 15 tonnes per load.

Comment:

Only one working face was permitted in the Licence issued. It is proposed that this face is 40 m by 40m for unbaled waste.

The second underlined section relates to the marshalling yard. See comment for Box 1 for this section.

The final underlined section relates to the original plans to always accept both baled and unbaled waste. The original intention was to increase baled and decrease unbaled waste received as the facility evolved. It is now proposed to accept primarily unbaled waste.

Box 4 (page 14)

Attachment A – Non Technical Summary

(d) The use of baled waste, the immediate compaction of waste as it is deposited on the landfill site, maintaining the active working faces as small as is practicable and the daily covering of the waste helps to reduce considerably the risks of fires, windblown litter, vermin and scavenging birds on landfill sites. In addition the landfill will be developed in distinct phases and cells, which will be progressively landscaped and restored.

Comment:

The immediate compaction of waste as it is deposited, maintaining small active working faces, and the daily covering of the waste shall provide appropriate mitigation against fires, windblown litter, vermin and scavenging birds on the landfill. This is detailed further in Annex B.2 of this submission.

Extracts from:
Bottlehill Landfill Environmental Impact Statement
submitted with:
Application for Waste Licence for Landfill at Bottlehill
July 2001

Box 1 (page 3)
Intro Paragraph 23

The landfill itself will be developed in eight distinct phases over its lifetime and each phase will last between 1.8 to 3.2 years, depending on the rate of waste deposition and the capacity of each phase. Clear felling of trees at the site will be carried out in advance of the development of each phase. Additional clear felling of trees will be required for the provision of the necessary site infrastructure including site roads, waste acceptance facilities, site accommodation etc. Waste deposition will only take place in the active phase and each phase will be approximately 5.05ha. in area. In addition each phase will be divided into a number of cells separated by temporary bunds. Depending on the rate of waste deposition the size of these individual cells may vary, but they are generally of the order of 1ha. The working faces of the landfill will also be limited to a maximum of approximately 40m by 40m for unbaled waste and 30m by 30m for baled waste.

Comment:

The subsequent Licence granted only allows for one working face. It is proposed that the working face will be no larger than 40m by 40m. This will be for unbaled waste.

For inspection purposes only.
Consent of copyright owner required for any other use.

Box 2 (pages 4 & 5)

1.2 Scenario 2

- *Scenario Two* was an extension of Scenario One, with the addition of the concept of separation of household and commercial waste into their respective components at a Waste Recovery Facility. The wet organic fraction (WOF) derived from the separation process would be composted and reused as a soil conditioner, in the landscaping of roads, as landfill cover etc., while the residual dry fraction (DF) would be baled/compacted and subsequently landfilled. Separate collection and composting of biowaste was also recommended; and

The implementation of Scenario 2 of the Waste Management Strategy requires the provision of sites for the following facilities to be located throughout the region:

- Bring Sites with additional glass bottle banks at restaurants, hotels, etc.
- Civic Amenity Sites
- Waste Recovery Facility to include the following elements:
 1. Mechanical Separation Plant (for separation of mixed waste into a wet organic fraction (WOF), residual dry fraction (DF) and ferrous/non-ferrous metals).
 2. Composting Facility (for composting the Wet Organic Fraction derived at the mechanical separation plant and biowaste separately collected at kerbside).
 3. Baling or compaction facility (for the bulk haulage of the recovered components to end markets and of the residual dry fraction to landfill).

Comment:

A strategic decision was made by Cork County Council, to procure the services of a private contractor to treat and, if required, bale waste going to Bottlehill Landfill. These services are now in place. This along with the provision of a 2-bin collection system achieves all the objectives of the original MRF proposal. All other waste accepted at Bottlehill Landfill from private contractors will achieve comparable standards of pre-treatment through similar methods of pretreatment. All waste will be pre-treated to comply with the relevant legislation and requirements and guidance of the Environmental Protection Agency. Due to the availability of larger transport units, larger pay-loads (up to 23 Tonnes) can be transported to Bottlehill Landfill in enclosed vehicles.

Box 3 (page 33)

2.1.4.1. Projected Traffic (Paragraph 1)

As was indicated previously the main source of waste will be the residue from the recovery facility, which will be baled. Other waste in an un-baled form will also be transported to the Bottlehill site. The landfill facility will also generate some additional trips in the form of service vehicles, journey to work trips etc. The expected waste HCV movements and vehicle movements due site operatives, service vehicles are shown in Table 2.1.1. A vehicle movement is a single movement i.e. either a laden trip to the landfill or an empty return journey.

Comment:

As stated the facility was developed to accept baled waste or unbaled waste or both. The source of waste will remain to be the residues of the Council's procured facility and that of other private operators. Although baled and unbaled waste would be transported separately, the methods of transportation of the waste will not vary. All waste will be transported in bulk and in enclosed vehicles. See Box 2 of this section for further detail.

*For inspection purposes only.
Consent of copyright owner required for any other use.*

Table 2.1.1: Bottlehill Residual Landfill Site - Projected Vehicle Movements

Year*	Total MSW Landfilled (tpa)	Baled Residual Waste (Max 185,000tpa) (tpa)	Unbaled Residual Waste (Remainder) (tpa)	Baled Waste HCV Movements** (20tonne per load) (No. of Trips/day)	Un-Baled Waste HCV Movements** (15tonne per load) (No. of Trips/day)	Car & other light vehicle movements (No. of Trips/day)	HCV Trips per Hour (No. of Trips/hr)	Other Trips per hour (No. of Trips/hr)
2004	112,749	45,000	67,749	31.5	63	40	9.5	4.0
2005	189,418	85,000	104,418	30.3	50	40	8.0	4.0
2006	198,889	85,000	113,889	30.3	54	40	8.4	4.0
2007	208,833	85,000	123,833	30.3	59	40	8.9	4.0
2008	217,604	85,000	132,604	48.1	39	40	8.7	4.0
2009	226,744	85,000	141,744	48.1	44	40	9.2	4.0
2010	236,267	135,000	101,267	48.1	48	40	9.6	4.0
2011	246,190	135,000	111,190	48.1	53	40	10.1	4.0
2012	254,807	135,000	119,807	48.1	57	40	10.5	4.0
2013	263,725	185,000	78,725	66.0	37	46	10.3	4.6
2014	272,955	185,000	87,955	66.0	42	46	10.8	4.6
2015	282,509	185,000	97,509	66.0	46	46	11.2	4.6
2016	292,397	185,000	107,397	66.0	51	46	11.7	4.6
2017	298,244	185,000	113,244	66.0	54	46	12.0	4.6
2018	304,209	185,000	119,209	66.0	57	46	12.3	4.6
2019	310,294	185,000	125,294	66.0	60	46	12.6	4.6
2020	316,499	185,000	131,499	66.0	63	46	12.8	4.6
2021	322,829	185,000	137,829	66.0	66	46	13.1	4.6
2022	329,286	185,000	144,286	66.0	69	46	13.5	4.6
2023	335,872	185,000	150,872	66.0	72	46	13.8	4.6
2024	171,295	90,000	81,295	62.9	76	46	13.9	4.6

* Assume landfill operations commence in July 2004 and cease in June 2024

** A vehicle movement is a single movement i.e. either a laden trip to the landfill or an empty return journey

Table 2.1.1 (page 34)

Comment:

The table shows unbaled waste transported in 15 Tonne loads. Present capacities of waste trailers are up to 23 Tonnes for loose or unbaled waste. Therefore there is no increase in vehicle movements when transporting un-baled waste.

Box 4 (pages 125 & 126)

3.1.2 Future Waste Quantities

It is envisaged that waste will primarily be transported to the site in two forms, namely:

- specialty adapted articulated heavy commercial vehicles (HCVs) hauling baled residual waste, from the proposed waste recovery facility, at an average payload of 20 tonnes per vehicle.
- heavy commercial vehicles (HCVs) including roll-on and roll-off containers, and other bulk haul containers, hauling loose waste, which is not suitable for pre-treatment/recovery, at an average payload of 15 tonnes per vehicle.

On average it is estimated that 85,000tpa of residual waste will be hauled to the landfill from the waste recovery facility in a baled form when the waste recovery facility is at a capacity of 225,000tpa. It is envisaged that further baling capacity for an additional 50,000 tonnes per annum will be provided at this or alternative baling facilities in the short term i.e. estimated by 2008. It is envisaged that a further 50,000 tonnes per annum baling capacity will be provided by the year 2013. The remainder of the waste will be hauled to the landfill in a loose format via HCVs at an average payload of 15 tonnes per load.

Comment:

As stated the facility was developed to accept baled waste or unbaled waste or both. It is now proposed to accept principally loose or unbaled waste. See Box 2 of this section for further detail.

For inspection purposes only
Consent of copyright owner required for any other use.

Box 5 (page 130)

3.3.1 Site Security Arrangements

Site security arrangements to prevent unauthorised access at the facility will include the following:

- Fencing around the entire boundary of the landfill site, with the exception of at the entrance, comprising concrete post and wire mesh fencing. The proposed fencing layout is shown on Drawing No. 0013011/01/517 (Vol. III, EIS), with fencing details presented in Drawing No. 0013011/01/512.
- Palisade type anti-intruder security fencing, 2.4m in height at the facility entrance gate area, and
- 2 No. 2.4m high by 8m wide palisade type security gates, that will be locked outside normal operating times, to be constructed at both the main site entrance and the facility entrance. These gates are located on Drawing No. 0013011/01/510 (Vol. III, EIS) and detailed on Drawing No. 0013011/01/512.
- The main entrance will also include for stone walls and pillars as detailed on Drawing No. 0013011/01/512.
- A CCTV system, which will monitor the main entrance gate, the facility site entrance gate, weighbridges, baled waste marshalling area, waste inspection and quarantine areas and working faces of the landfill.
- A road/jeep track and surface water swale running around the entire footprint of the site.
- Anti-intruder alarms in all lockable site buildings.

Comment:

The baled waste marshalling yard was constructed as part of the specified engineering works at the Landfill Facility. The marshalling yard consists of a concrete hard standing area approximately 1,750 square meters in area. The original function of this area was to create an area for the delivery of baled waste in containers. The enclosed containers would be delivered to this area by the road going vehicles. Site vehicles would then bring the containers of waste to the working face of the Landfill. This may continue to be the case, the only difference being the waste in the enclosed containers would be loose rather than baled. Alternatively, road going vehicles can bring waste directly to the working face of the Landfill. Adequate wheel cleaning facilities are in place to allow this practice to take place. In all cases, waste will be transported to the working face Landfill in enclosed vehicles. The current proposal for the acceptance of primarily unbaled waste will not change the method of delivery of waste to the facility. Waste will be delivered in specialised fully enclosed containers.

Box 6 (page 132)

3.3.3 Hardstanding

Concrete hardstand areas will be provided at the waste inspection and quarantine area, the baled waste marshalling area, the leachate storage area and the fuel storage area. The location of these areas at the site are shown on Drawing No. 0013011/01/517-519 and are detailed on Drawing No. 0013011/01/533.

Comment:

See comment for Box 5

Box 7 (pages 133 &134)

3.3.7 Fuel/Chemical Storage Areas

Bunded fuel storage will be provided for the diesel fuel utilised on site for the following plant and equipment:

- 1 No. waste compactor
- 3 No. off-road baled waste haulage trucks
- 1 No. baled waste loader (360° excavator fitted with a grab)
- 1 No. back-hoe excavator
- 1 No. D6 dozer
- 1 No. site tractor
- 1 No. road sweeper
- 1 No. standby diesel pump
- 1 No. standby generator

A proprietary bunded fuel storage tank will be provided adjacent to the maintenance shed at the site at the location shown on Drawing No. 0013011/01/518. This bunded fuel store will comprise of a 20,000 litre (20m³) tank located in a bund with a total capacity of 30m³.

Comment:

Similar vehicles will be used to transport waste to the working face if the waste is baled or unbaled. A landfill compactor will also be used on site to immediately compact unbaled waste after deposition.

Box 8 (pages 134 & 135)
3.3.9 Waste Inspection Areas

The waste inspection area will be constructed on hardstanding to the north of the site entrance adjacent to the baled waste marshalling area and will be surrounded by a reinforced concrete wall 0.5m high.

It is proposed that the baled waste containers will be unloaded from the articulated lorries at the baled waste marshalling area and held on the stillages prior to reloading onto off-road site trucks for haulage to the working thee of the landfill. Visual inspection of all baled waste will be carried out at the working face of the landfill by the baled waste handling operator. It should however be noted that this baled waste will have been hauled from the proposed WRF and therefore the composition of this waste type will have already been recorded at this facility.

The compactor operator will also carry out visual inspections of all unbaled loads entering the facility at the working face of the landfill. The facility manager and facility supervisor will also carry out periodic inspections of waste loads, particularly in the case of suspect loads.

Comment:

As per comment on marshalling yard on Box 5.

Box 9 (page 136)
3.3.10 Traffic Control

An adequate number of signs will be positioned strategically around the site to direct users to each phase of the facility in a proper manner. Vehicles hauling baled waste will be directed to the bale marshalling area, while contractors carrying unbaled waste will be directed to the working face of the landfill current at that time.

The internal road length from the main site entrance at the public road to the facility site entrance is over 3.1km in length, which will eliminate the possibility of traffic queuing onto the adjoining public road.

The traffic routing around the site also ensures that the persons visiting the administration office; for instance for deliveries of office supplies, site meetings etc., are kept away from the baled waste marshalling area and the working face of the landfill and from any HCVs using the landfill.

Comment:

As per comment on marshalling yard on Box 5.

Box 10 (page 138)

3.3.13 Plant Sheds, Garages

A vehicle maintenance building, sized (18 m x 10 m x 6 m) to accommodate a landfill compactor, the baled waste loader and off-road waste haulage trucks, will be provided at the site at the location shown on Drawing No. 0013011/01/518. This building will be a clad steel portal framed building with a concrete floor as detailed in Drawing No. 0013011/01/538. This building will be fitted with secure storage areas to accommodate power tools, other small plant and equipment. A proprietary banded container to EPA requirements will also be provided for the storage of hydraulic oil in the maintenance building.

Comment:

The maintenance building, which has been constructed, shall be used for storage of other vehicles and materials. The building has been constructed as per original design.

Box 11 (page 139)

3.3.15 Fire Control System

The landfilling of baled waste, the immediate compaction of loose waste as it is deposited on the landfill site, the maintenance of the active tipping area as small as is practicable and the daily covering of all the compacted waste will help to reduce considerably the potential risk of fire at the proposed facility.

Comment:

It is stated that the immediate compaction of loose waste as it is deposited on the landfill site will help to reduce considerably the potential risk of fire at the proposed facility. This along with other mitigation measures provides an adequate fire control system. There is no evidence to suggest that the removal of baling will increase the risk of fire occurring.

Box 12 (page 156)

3.7.6 Size of Working Area

The size of the working area for the baled waste will also be kept to a within a maximum of 30 m x 30 m. This size of the working areas is required in order to allow for the efficient operation of the bale handling equipment and the stacking of the bales.

Comment:

See comment for Box 1.

Box 13 (page 171)

3.9.6 Programme for Monitoring Landfill Settlement and Stability

The amount of settlement within landfills is difficult to predict and will depend on a number of factors such as the timing of waste deposition, the type of waste, whether the waste was baled or unbaled, the compaction equipment utilised, the depth of the waste etc. It is important however to monitor the extent of settlement at the landfill as the settlement process may cause damage to the cap, the gas collection and drainage systems. In particular the extent of differential settlement should be assessed.

Comment:

As waste in Cork, and around the country, has been landfilled in loose format historically, a better understanding has been formed on how this waste will settle in Landfill. Therefore there are less unknowns and more appropriate planning can be carried out where loose waste is landfilled. The settlement of baled waste would need to be assessed on an ongoing basis and will require more responsive planning measures. This is explored further in the Fehily Timoney document attached to this submission.

Box 14 (page 172)

3.9.7 Specification for Daily Cover

The working face of the landfill, including areas for baled waste, will be covered on a daily basis with natural soils won on-site or proprietary alternatives such as hessian, biodegradable geo-synthetic sheets etc. The inclined front face of the cell will also be covered with sheeting on days when landfilling is not taking place.

Comment:

Landfilling baled waste shall create a near vertical working face of the landfill. This is normally covered by plastic sheeting at the end of the working day. This practice is labour intensive and more challenging from a health and safety perspective. The covering of loosely landfilled waste is straight forward involving only the use of plant, machinery and materials and is not labour intensive. This practice is therefore preferred.

Box 15 (page 182)

3.13.2 Plant and Equipment

The following plant and equipment will normally be employed on-site:

- 1 No. waste compactor
- 3 No. off-road baled waste haulage trucks
- 1 No. baled waste loader (360° excavator fitted with a grab)
- 1 No. back-hoe excavator
- 1 No. D6 dozer
- 1 No. site tractor
- 1 No. road sweeper
- 1 No. standby diesel pump
- 1 No. standby generator
- 1 No. gas flare

Comment:

Similar off road vehicles may be used to transport the waste to the working face. Also a Landfill compactor will be used as may an excavator for waste placement, site development and restoration works.

Box 16 (page 183)

3.13.3 Waste Acceptance Procedures

Following logging of authorised vehicles at the in-weighbridge these vehicles will be directed to the working face of the landfill or to the baled waste marshalling area.

It is proposed that baled waste containers will be unloaded from the articulated lorries at the baled waste marshalling area, temporarily held on stillages and reloaded onto the off-road baled waste haulage trucks for haulage to the working face of the landfill. A visual inspection of the baled waste will be carried out by the operator of the baled waste loader at the working face of the landfill. It should however be noted that this baled waste will have been hauled from the proposed WRF and/or baling station and therefore the composition of this waste type will have already been recorded at these facilities.

The compactor operator will also carry out visual inspections of all unbaled loads entering the facility, at the working face of the landfill, to ensure that no undesirable material is mixed through the waste. Unacceptable loads will be refused entry or directed to the waste inspection/quarantine area as appropriate. The results of all these checks will be documented and retained for auditing purposes.

Comment:

See comment on Box 5.

Box 17 (pages 183 & 184)

3.13.4 Waste Handling

Unbaled waste from the HCVs will be deposited at the active landfill face as directed a by the site operative on duty at the working face. The waste will be spread and compacted in 1m lifts using a steel-wheeled compactor with a minimum gross weight of 30-40 tonnes. The compactor will pass backwards and forwards over the waste until the desired level of compaction is achieved. The working face will be kept to a maximum of 40m by 40m. The waste will be covered at the end of each working day using natural soils or proprietary daily cover materials such as hessian etc.

It is proposed that the baled waste containers will be unloaded from the articulated lorries at the baled waste marshalling area, held on the stillages prior to reloading onto off-road baled waste haulage trucks for haulage to the working face of the landfill.

At the working face the baled waste will be unloaded and stacked tightly in an organised manner. The baled waste area will be formed in lifts of 3 bales high with the working face kept to a maximum of 30m by 30m. The baled waste will covered at the end of each working day using proprietary biodegradable sheeting and at the end of each week with natural soils or suitable re-processed construction and demolition waste. The baled waste handling tracked loader will also traverse back and forward over the bales a number of times to provide for additional compaction.

It is also proposed that a lift of two bales of waste will be placed on top of the drainage layer in the landfill cells into which unbaled waste deposition will take place. This will provide additional protection to the liner underneath from potential puncture by unbaled waste materials.

Comment:

Appropriate procedures are in place for the deposit of unbaled waste. It is proposed that these procedures would be employed for all waste as all waste will be unbaled or loose. As with baled waste, a 1 to 2_m layer of loose waste (immediately compacted) will be placed initially so as to give further protection to the Landfill Liner. As per the Waste Licence, all operating procedures will be approved by the EPA prior to waste acceptance.

Box 18 (page 187)

3.14.2 Bird Control

The presence of scavenging birds such as crows and gulls will be continuously monitored. Environmental nuisance resulting from the activities of scavenging birds on the landfill site will be controlled and minimised by the following measures:

- The site will be for the acceptance of residual waste and waste which is not suitable for treatment and therefore will contain a lower biodegradable fraction compared to traditional landfill sites and will attract less scavenging birds.
- The residual waste deposited in a baled format will be less attractive to scavenging birds.
- The active working faces will be kept as small as possible and all other areas will be covered.
- Daily cover material such as hessian, biodegradable geo-synthetic sheeting or soil will be placed on the working faces at the end of each working day.
- The use of netting as a deterrent to scavenging birds will be considered at the site if necessary. A trained falconer will also be employed at the site if necessary.

Comment:

The other measures stated above shall provide appropriate mitigation or effective bird control. As the waste deposited shall contain far less biodegradable than historical landfill waste, this shall make the waste less attractive for birds scavenging. This is explored in more detail in the Fehily Timoney document included in this submission.

For inspection purposes only
Consent of copyright owner required for any other use

Box 19 (pages 187 & 188)

3.14.3 Fire Control

A number of fire control measures will be put in place at the site as detailed in Section 3.3.15. These include the following:

- The immediate compaction of unbaled waste as it is deposited on the landfill site.
- The placement of tightly baled waste in tight building blocks at a maximum of 3 bales high.
- Maintaining the working faces of the landfill as small as possible.
- Providing a water supply to the site, surface water holding lagoons and fire hydrants.
- A water bowser will also be available to deal with any small fires on the landfill. Training of all site operatives and employees in fire prevention and control and emergency response procedures.
- Prominent posting of emergency response contact numbers (fire service, Gardai, ambulance and other agencies).
- The provision of fire extinguishers and smoke detectors in all site buildings.
- The designation of smoking and non/smoking areas. In particular smoking will not be permitted on the landfill footprint and will only be allowed in designated areas of the administration building.

Comment:

Appropriate fire control can be maintained as stated by the immediate compaction of unbaled waste as it is deposited.

For inspection purposes only. Consent of copyright owner required for any other use.

Box 20 (page 188)

3.14.4 Litter Control

The following measures will be employed at the site to control litter:

- Residual waste will be brought on site as tightly compacted baled waste. Any broken bales will be deposited at the area for the unbaled waste and immediately compacted using the on-site refuse compactor.
- All unbaled waste will immediately be compacted following tipping using the on-site waste compactor.
- The active working face will be kept as small as possible and all other areas will be covered.
- Daily cover material such as hessian, biodegradable geo-synthetic sheets or soil will be placed on the working face at the end of each working day.
- Modern wind blow netting systems will be employed at the working face of the landfill particularly for the unbaled waste.
- In the event of failure of the wind blow netting system the proposed fencing around the site will also prevent litter from being blown off site. This fence will be regularly inspected by site operatives and cleaned if required.
- Regular inspection and litter collection will be undertaken at the site and adjoining land if and when necessary.
- All waste entering the landfill will be in covered vehicles. Cork County Council will exclude any contractor failing to comply with this requirement from entering the site.
- The approach roads from the N20 to the site will be monitored on at least a daily basis and in the event of litter being found on these roads, site staff will promptly remove it and deposit it in the appropriate manner at the landfill site.
- A general clean-up and attendance work will be carried out on a weekly basis by site staff around the entire perimeter of the landfill footprint, on all internal haulage roads and on approach roads.

Comment:

As stated, appropriate controls in place for the deposit are adequate for the control of litter.

Box 21 (page 189)

3.14.5 Odour Control

Odour emission from the landfill site will be reduced and controlled as follows:

- The size of the working faces will be minimised.
- The unbaled waste will be immediately and thoroughly compacted after it is deposited.
- Daily cover material such as hessian, biodegradable geo-synthetic sheets or soil will be placed on the working face at the end of each working day.
- The daily cover will be augmented with a weekly covering of a mineral clay layer.

Comment:

These proposals remain in place.

Box 22 (page 189)

3.14.8 Vermin Control

It is recognised that poorly managed landfill sites have the potential to attract vermin such as rats and flies. It is proposed to put in place strict control procedures at the proposed facility in order to control the population of vermin.

The vermin population will be controlled by the rapid compaction of waste and the placement of the baled waste as tightly as possible to reduce interstitial spaces between the waste. Regular covering of the waste as outlined previously will also be employed at the site.

Comment:

The placement of unbaled waste will prevent any arising of interstitial spaces, reducing the risk of vermin infiltration into the waste body.

For inspection purposes only
Consent of copyright owner required for any other use

Box 23 (page 205)

4.1.1.2 Proposed Mitigation Measures (Dust)

The control of dust at the site has been addressed previously in Sections 3.3.5, 3.12.3 and 3.14.6 herein. In summary the following mitigation measures are proposed:

- Temporary and permanent wheel washes proposed at the landfill site will ensure that dust emissions are not caused from the tyres of either waste or construction vehicles.
- The wheel-wash at the landfill facility is positioned to ensure that waste vehicles leaving the site do not carry excess soil and material.
- The baled waste will be fully contained within the enclosed containers at the marshalling yard prior to haulage by the off-road slave vehicles to the working face of the landfill.
- The baled waste will be tightly placed and stacked by the bale handling tracked machine. This will also traverse back and forth over the bales to ensure further compaction.
- The loose waste will be immediately and thoroughly compacted after it is deposited.
- Daily cover material such as hessian, biodegradable geo-synthetic sheets, soil etc. will be placed on the working face at the end of each working day.
- The daily cover will be augmented with a weekly covering of a mineral layer.

Comment:

All waste will be delivered to the landfill, and held in, enclosed containers/vehicles until it is brought to the working face of the landfill. This is the case for either baled or unbaled waste.

For inspection purposes only.
Consent of copyright owner required for any other use.

Box 24 (page 207)

4.1.2.2 Potential Impact of the Proposed Development

Generally noise emissions will arise on an intermittent basis depending on the activity level of certain plant and equipment. While noise emissions will arise through the operation of a number of noise sources, the most significant of the landfill's noise sources have been identified as follows:

- Landfill Gas Ground Flare Unit
- Screening plant for processing clay
- 1 No. Waste Compactor
- 3 No. Off-site Baled Waste Haulage Trucks
- 1 No. Baled Waste Loader
- 1 No. Back-hoe Excavator
- 1 No. D6 Digger
- 1 No. Site Tractor
- 1 No. Road Sweeper
- 1 No. Standby Diesel Pump
- 1 No. Standby Generator

Comment:

Similar vehicles will be used to transport waste to the working face if the waste is baled or unbaled. A landfill compactor will also be used on site to immediately compact waste after deposition. All vehicles used, shall not create any further or louder noises that are outlined.

For inspection purposes only.
Consent of copyright owner required for any other use.

Table 4.1.1 Activity L_{Aeq} of the various sources of plant/equipment

21

Table 4.1.1: Activity L_{Aeq} of the various sources of plant/equipment

Plant/Equipment	Activity L _{Aeq} at 10 m (dBA)	Likely Maximum Duration of Operation (hours/day)
Ground Flare Unit	67	Intermittent operation day and night
Screening plant for processing clay	75	8 hours
1 X Waste Compactor	78	8 hours
3 X Off-site Baled Waste Haulage Trucks	77	8 hours
1X Back-hoe Excavator	75	8 hours
1 X D6 Dozer	79	8 hours
1 X Site Tractor	80	8 hours
1 X Road Sweeper	73	8 hours
1 X Standby Diesel Pump	70	8 hours
1 X Standby Generator	75	Intermittent operation day and night

Comment:

The vehicles will be used in place of the baled waste haulage trucks are comparable in size and nature and will not create any noise over and above those stated in the table. See box 24 for more detail.

Table 4.1.3 Impact of Noise Emissions from landfill and clay borrow sources at the nearest house

Table 4.1.3: Impact of Noise Emissions from landfill and clay borrow sources at the nearest house.

Plant/equipment	Nearest House (metres)	Calculated SPL* (dBA)
Ground Flare Unit	1300	25
Screening plant for processing clay	550	40
Waste Compactor	550	43
3 X Off-site Baled Waste Haulage Trucks	550	42
1X Back-hoe Excavator	550	40
1 X D6 Dozer	550	44
1 X Site Tractor	550	45
1 X Road Sweeper	550	38
1 X Standby Diesel Pump	550	35
1 X Standby Generator	1300	33

* SPL = Sound Pressure Level

At any given time a maximum of two or three items of plant or equipment will be

Comment:

See comment for Box 24.

Box 25 (page 212)

4.1.3.1 Potential Impacts (Odours)

Potentially odours will arise from the landfill site as a consequence of:

- Direct emissions during the tipping of fresh waste at the working face including the placement of baled waste;
- Emissions from tipped unbaled waste at the exposed face of the landfill. These odorous components are formed by both aerobic and anaerobic degradation of the organic waste fraction;
- Emissions of landfill gas through the surface of the landfill. Landfill gas, as outlined in Section 3.8, is formed by anaerobic degradation of the organic fraction of the waste deposited. Landfill gas contains trace concentrations of odorous gas in addition to those outlined above, including volatile aromatic compounds,
- mercaptans and hydrogen sulphide, which at low concentrations can give rise to odours.
- Odours can also occur during the on-site treatment of leachate and aerial recirculation of leachate.

Comment:

These emissions are controlled by the use of daily cover and implementation of an odour management plan and active landfill gas management which will be in place at Bottlehill Landfill. The placement of unbaled waste shall not cause any additional odours than that of baled waste placement. The reduction of Biodegradable waste through pre-treatment shall also reduce odours arising.

Box 26 (page 213)

4.1.3.2 Proposed Mitigation Measures (Odours)

Odour emission from the landfill site will be reduced and controlled as follows:

- The size of both working faces will be minimised.
- The baled waste will be contained within fully enclosed containers until it is stacked at the working face, where the bales will be further compacted by traversing the bale handling equipment.
- The loose waste will be immediately and thoroughly compacted after it is deposited.
- Daily cover material such as hessian, biodegradable geo-synthetic sheets or soil will be placed on both the working faces at the end of each working day.
- The daily cover will be augmented with a weekly covering of a mineral layer.
- There will be no aerial recirculation of leachate with all recirculation taking place underneath either a temporary or permanent cap.

Comment:

Measures are in place for the placement of both loose and baled waste. The measures for unbaled waste are appropriate to mitigate against any nuisance being caused.

Box 27 (page 228)

4.5.1.1 Landfill Operations

Visual impacts will occur as a result of the following landfill operations proposed at the site:

- The waste handling activities at the baled waste marshalling yard and at the two working faces of the landfill.
- The operation of the landfill in a phased manner.
- The movement of vehicles to and from the site. Primarily the traffic serving the site will arrive via the preferred access route from the junction with the N20 at Lissavoura Cross Roads to Daly's Cross Roads to the main site entrance as outlined in Section 2.1.4.
- The presence of the site infrastructure, e.g. buildings, roads, leachate holding tanks, surface water lagoons etc.
- The requirement for lighting particularly during winter evenings.
- The erection of wind blow litter netting systems.
- The restoration of completed landfill areas. On completion of each phase of the landfill the site will be progressively restored. On final completion of landfilling, the finished landform will rise to a height of 285.5m O.D., which is at least 25m lower than the highest point on the Bottlehill forestry site. On final restoration the proposed landform will blend into the surrounding topography. The edges of the top of the proposed landfill will fall away on all sides, at its steepest at slopes of 1 in 3, to meet existing ground levels.

Comment:

Only one working face is now permitted by the Licence and activities shall be management in accordance with those Licence conditions. The placement of primarily unbaled waste shall not create any additional visual impacts over unbaled waste.

For internal purposes only.
Consent of copyright owner required for any other use.

Box 28 (pages 235 & 236)

4.5.3.4 Wind Blown Litter

Wind blown litter is potentially the most significant cause of visual impact at the proposed landfill site at Bottlehill. The litter control measures are as follows:

- The use of baled waste.
- Efficient use of compaction plant particularly for the unbaled waste.
- Modern wind blow netting systems will be employed at the working face of the landfill.
- Use of daily cover material.
- Regular inspection and litter collection will be undertaken at the site and adjoining land if and when necessary.
- All waste entering the landfill will be in covered vehicles. Cork County Council will exclude any waste contractor failing to comply with this requirement from entering the site.
- The approach roads to the site will be monitored on at least a daily basis and in the event of litter being found on these roads, site staff will promptly remove it and deposit it in the appropriate manner at the landfill site.
- A general clean-up and attendance work will be carried out on a weekly basis by site staff around the entire perimeter of the landfill site.

Comment:

Measures are already in place for the deposit of unbaled waste in order to control wind blown litter. These measures provide adequate mitigation at other landfills when correct working practices are employed. The arising of wind blown litter will also be reduced by the provision of a 2nd bin for recyclables collection and the pretreatment of waste prior to landfill.

For inspection purposes only.
Consent of copyright owner required for any other use.

Box 29 (pages 239 & 240)

4.6.2.2 Mitigation by Reduction (Fauna)

The numbers of gulls and corvids attracted to the site will be controlled and minimised by the following measures:

- The landfill waste will contain a lower biodegradable fraction compared to traditional landfill sites and will attract fewer scavenging birds.
- The residual waste deposited will be for the most part in a baled format and therefore less attractive to scavenging birds.
- The active working faces will be kept as small as possible and all other areas will be covered.
- Daily cover material such as hessian, biodegradable geo-synthetic sheeting or soil will be placed on the working faces at the end of each working day.
- The use of netting as a deterrent to scavenging birds will be considered at the site if necessary.
- A trained falconer will also be employed at the site if necessary. The presence of falcons at the site is not predicted to impact upon hen harriers.
- Rodent control on the site will be by a combination of general management measures including:
 - The rapid compaction of unbaled waste and placement of baled waste as tightly as possible to reduce interstitial spaces between bales.
 - Regular covering of the waste will minimise populations of rodents at the site.
 - There is a threat to hen harrier from rodenticides. Their use will be restricted to minimise the risk of bioaccumulation of toxins in hen harriers. Where it is necessary to use rodenticides, "Warfarin" is recommended as it breaks down relatively quickly and minimises the risk of bioaccumulation. Bait will be placed in areas that are not accessible to non-target species and where possible dead or dying vermin will be removed as soon as possible. Alternative methods of pest control, including the use of traps, will be investigated.

Comment:

See comment for Box 18.

Extracts from:
Report to the Environmental Protection Agency on the Oral Hearing
for the Objections to the Proposed Decision in respect of the
Waste Licence Application for a Residual Landfill at Bottlehill.
Paul Johnston, November 2003

Box 1 (page 8 of 84)

2.2.1 OPENING STATEMENTS

Opening statement by Mr. David Holland on behalf the applicant, Cork County Council (CCC)

Mr. Holland in his Opening Statement on behalf of Cork County Council set the proposed development in the context of EU Waste Management Law, National Waste Policy, the Cork Regional Waste Management Strategy, Cork County Council and Cork City Council Waste Management Plans. Below is a summary of the issues raised in Mr. Holland's Opening Statement. This Opening Statement in its entirety is set out in Document No.1 (doc1), entitled *Opening Statement on behalf of Cork County Council*.

Mr. Holland set out the Cork County Council and Cork City Council Waste Management Plans in the context of the obligations related to the Waste Management Act, 1996 and, where appropriate, relates these to specific actions as set out in the Plan in question. He included specific reference to Action 27 of the Plan which provides for the development of a Waste Recovery Facility (WRF) in co-operation with Cork City Council which will serve both Cork County and City. In this regard, Mr. Holland set out what such a facility would provide, namely

- The active segregation of a number of waste streams
- Their more effective recovery and disposal
- The separation of a wet organic fraction, dry recyclables, metals, residual waste for landfill
- Baling and compaction facility to provide for the bulk haulage of the recovered /residual components
- Composting of the separate Wet Organic Fraction.

Comment:

A strategic decision was made by Cork County Council, to procure the services of a private contractor to treat and, if required, bale waste going to Bottlehill Landfill. These services are now in place. This along with the provision of a 2 bin collection system achieves all the objectives of the original MRF proposal. All other waste accepted at Bottlehill Landfill from private contractors will achieve comparable standards of pretreatment through similar methods of pretreatment. All waste will be pre-treated to comply with the relevant legislation and requirements and guidance of the Environmental Protection Agency.

Due to the availability of larger transport units, a large tonnage of loose waste (up to 23 Tonnes) can be transported to Bottlehill Landfill in enclosed vehicles.

Box 2 (page 10 of 84)

2.2.1 OPENING STATEMENTS

Mr. Holland then outlined the main aspects of the waste licence application and the main characteristics of the proposal as set out in Doc1:Opening Statement on behalf of Cork County Council - including site location, principal activity, ancillary activities, waste acceptance (baled waste, unbaled waste and inert waste, prohibited wastes, size of facility/landfill capacity and associated clay borrow area, landfill design criteria, operation closure and restoration of the landfill.

Comment:

It was later stated in the Oral Hearing that approximately 60% of the waste going to Bottlehill would be baled with 40% unbaled. Therefore Bottlehill landfill was designed to accept loose waste. It is now proposed that all the waste going to Bottlehill be primarily loose or unbaled.

Box 3 (page 11 of 84)

2.2.1 OPENING STATEMENTS

Mrs Curtin concluded her opening statement by stating that the goal posts were now changed, explaining that unbaled waste was now proposed, adding that this had not previously been proposed. She highlighted that there was no Materials Recovery Facility in place and questioned how the proposed development could take place in this case.

Comment:

It was later stated in the Oral Hearing that approximately 60% of the waste going to Bottlehill would be baled with 40% unbaled. The Materials recovery is now in place through the services of a private contractor. See Box 1 for more detail.

Box 4 (page 38 of 84)

Mr. Noonan: Cross-examination of Mr. Paul Murphy on vermin control

Was there any assessment of the likely fate of flying vermin being eliminated by rodenticide?

The use of rodenticides is for rats. There is no means of chemical control proposed for birds. Bird control is to be achieved by a combination of :

- Minimisation of biodegradable waste
- Deposit of waste in baled form
- Use of cover material

Use of netting will also be considered with the use of a falcon.

Comment:

The requirement for the minimisation of biodegradable waste and the correct usage of daily cover shall provide appropriate mitigation against Bird infestation. The use of unbaled waste shall not reduce the mitigation measures as the waste will be covered at the end of every working day.

Box 5 (page 39 of 84)

Questions from Ms Mary Condon to Mr Paul Murphy

I read in the EIS that insecticides, pesticides and rodenticides will be used. I took pesticides as bird control. This is not the case. Proposed rodent control is by a combination of measures – refer to Section 4.6.2.2 of the EIS. This control would include rapid compaction of waste, tight packing of baled waste, and regular covering of waste. Warfarin is recommended for rodents, it breaks down quickly and is no ecological threat. Warfarin will only be used when necessary as an alternative to other measures of pest control which will be investigated.

Comment:

The procedures of the rapid compaction of waste, regular covering of waste and use of rodenticides will provide appropriate mitigation against vermin infestation. The use of unbaled waste will not reduce the mitigation measures. These measures are currently used to sufficient effect on other landfill sites in Ireland.

Box 6 (page 57 of 84)

2.2.4 ROADS, ACCESS AND ENVIRONMENTAL NUISANCE

Mr John O’Riordan, BEA, Mr Diarmuid Cronin, CEC and Mr Joe Sherlock TD also raised questions as to the practicality of constraining landfill traffic to using the preferred route. Mr Laphorne indicated CCC would look at an automatic clocking and logging system similar to the one in use at the Kill landfill in Co. Kildare, which requires vehicles carrying baled waste to follow a particular route. Nevertheless, concern was expressed as to whether private contractors could be required to conform to such a plan. In conclusion, Mr Laphorne, in response to questioning by Mr David Holland (CCC), stated that the N20 junction was adequate as it was, since there had been no difficulties since it was built 10 years ago. Although additional noise and diesel emissions could be expected from HCVs on negotiating junctions on the access route, and particularly on gradients, such increases would not be excessive.

Comment:

These tracking systems can be used regardless of whether the waste is baled or unbaled. All waste shall be transported to the Landfill in bulk.

Box 7 (page 59 of 84)

2.2.5 WASTE ACCEPTANCE

A second area of concern voiced by a number of objectors (Mr Joe Sherlock TD, Mrs Kathleen Curtin and Mr Joe Noonan, BEA) was in the proportion of waste in baled form. It was understood by many of the objectors that all the waste was to be baled although this was not stated in the EIS or PD. Senator Paul Bradford gave evidence on behalf of Mr Joe Sherlock TD and BEA that he understood that all waste for Bottlehill would be routed through the MRF and baled except for minor amounts of inert, ‘untreatable waste’. Mr David Holland (CCC) reiterated figures in the EIS that on average, 60% of the waste would be (wire-) baled and the rest (40%) loose. Hence there was a need for two operating faces at the landfill.

Comment:

It was stated in the Oral Hearing that approximately 60% of the waste going to Bottlehill would be baled with 40% unbaled. The facility was constructed to accept either baled or unbaled waste or both.

Box 8 (page 83 of 84)

Inspectors Recommendations

5. Waste Acceptance

The most significant issue with respect to the proposed waste licence is the nature of the waste and its volumes. The application is for residual waste, and, as indicated at the hearing, for both baled and loose waste. The meaning of residual was sought during the hearing but it appears that the intention is that (as in the Landfill Directive) any form of treatment will result in 'residual waste'. However, treatment may be as little as partial separation or a combination of more complex separation and processing operations. While the stated intention of the applicant is to route all the county's domestic and commercial waste to Bottlehill via 'treatment stations or MRFs' at strategic locations, none of these are yet in place. The loose waste component (approximately 40% of the total waste input) is derived from waste that 'cannot be dealt with practically by the separation facility or is inert'. Moreover, having effectively two operating faces (baled and loose waste) in the landfill throughout the life of the site is neither good operating practice nor good risk management, especially in a hydrologically sensitive environment. The projected waste volumes also indicate that there is likely to be as much organic waste dumped per year at the end of the life of the landfill as at the beginning, notwithstanding the legislative requirement to separate out organic waste and to reduce the volumes landfilled in the medium term – the proportions of organic waste may be improving but the absolute tonnage amounts are predicted to remain relatively stable. Thus, there will be ongoing, long term leachate and gas management problems. The long term sustainability of such a waste management solution at this site remains in question.

In short, if this site is to operate under a licence consistent with current waste management practice, it should only be baled waste and also truly 'treated' (i.e. fully/practically separated waste) having passed through an appropriate facility. This constraint will also control the number and types of vehicle going to the landfill and will facilitate necessary controls on the route to be taken by the vehicles.

In summary, the site is not good hydrologically for a landfill, although engineering and operating controls could make it operable, if not cost-effective. Ecologically however, the landfill will represent an unacceptable intrusion on the surrounding conditions, particularly in relation to the hen harrier. The nature of the waste to be accepted at the landfill, were it to operate should be consistent with current waste management requirements, as indicated in the county waste management plan – ie truly residual waste, preferably in baled form and with a significantly reducing organic content.

Comment:

As stated, the application is for residual waste, and, as indicated at the hearing, for both baled and loose waste. Permission was granted to accept loose waste as well as baled waste.

Current waste management practice does not use baled waste. Since the granting of the licence for Bottlehill, no other facility has applied to accept baled waste nor has the EPA imposed this condition on any operator.

There is no technical or environmental advantage in baling waste prior to landfill; a process that places additional costs on facility operators.

**Extracts from:
Inspectors Report on:
Bottlehill Landfill Licence Application
Environmental Protection Agency, 18/11/2004**

Box 1 (page 2 of 27)

(2) Facility Development

The infrastructure proposed for the facility includes the following: two weighbridges, a wheelwash, a waste quarantine area, a waste inspection area, site security arrangements (including gates and fencing, CCTV and anti-intruder alarms), car parking facilities, sheds, an administration building, a fire control system, a surface water drainage system, a baled waste marshalling area and fuel and chemical storage area. Laboratory facilities will be provided in the administration building for the routine

monitoring of a limited number of parameters including BOD, COD, Conductivity, Dissolved Oxygen, Ammonia, Phosphorus etc. Traffic control measures are also proposed for the area near the site entrance, as well as for internal access. The installation of all infrastructure is controlled by Condition 3 of the recommended PD.

Comment:

The baled waste marshalling yard was constructed as part of the specified engineering works at the Landfill Facility. The marshalling yard consists of a concrete hard standing area approximately 1,750 square meters in area. The original function of this area was to create an area for the delivery of baled waste in containers. The enclosed containers would be delivered to this area by the road going vehicles. Site vehicles would then bring the containers of waste to the working face of the Landfill. This may continue to be the case, the only difference being the waste in the enclosed containers would be loose rather than baled. Alternatively, road going vehicles can bring waste directly to the working face of the Landfill. Adequate wheel cleaning facilities are in place to allow this practice to take place. In all cases, waste will be transported to the working face Landfill in enclosed vehicles. The current proposal for the acceptance of primarily unbaled waste will not change the method of delivery of waste to the facility. Waste will be delivered in specialised fully enclosed containers.

Box 2 (page 4 & 5 of 27)

Facility Operation

The operation of the facility in general is controlled by Condition 5 of the recommended PD. It is proposed that the facility will not be allowed to accept waste delivered by members of the public. It is proposed to accept both baled and unbaled waste at the facility. Baled waste containers will be deposited at the baled waste marshalling area where they will be reloaded and brought to the working face of the landfill by off-road baled waste haulage trucks. The baled waste will be visually inspected at the working face of the landfill.

Condition 5.3 of the PD requires that a report detailing all waste acceptance and handling procedures be submitted to the Agency for agreement.

From the date of grant of the licence a proportion of the waste accepted at the facility should be in baled form. E.I.S. section 3.1.2 states that on average 85,000tpa of waste will be accepted at the facility in baled form, with this amount increasing to 135,000 by the year 2007 and to 185,000 by 2012. This proposal has been included as a condition of the recommended PD (Condition 5.8.2). Increases in the proportion of waste accepted in baled form should be included in the schedule of objectives and targets (listed in Schedule F).

Comment:

The facility has been developed to accept both or either baled or unbaled waste. If most or all of the waste brought to the landfill is unbaled, this does not effect the operational procedures of the facility.

Condition 5.3 of the licence requires operating procedures to be submitted prior to the acceptance of waste activities. All operational procedures will be approved by the Agency in accordance with the specified Licence conditions. The projection of a certain tonnage to baled or unbaled waste was to coincide with the availability of baling infrastructure. It is now proposed that all waste delivered to the landfill will be in unbaled format however some baled waste may be accepted at the facility.

ANNEX B.2

Environment and Engineering Comparison

For inspection purposes only.
Consent of copyright owner required for any other use.



**WASTE LICENCE REG. NO. W0160-01
BOTTLEHILL LANDFILL**

WASTE LICENCE REVIEW

SUBMISSION ON WASTE BALING

Prepared for:

Cork County Council
County Hall
Cork

Prepared by:

Fehily Timoney & Company
Core House
Pouladuff Road
Cork

January 2010





**WASTE LICENCE REG. NO. W0160-01
BOTTLEHILL LANDFILL**

WASTE LICENCE REVIEW

**SUBMISSION TO ENVIRONMENTAL PROTECTION
AGENCY**

User is Responsible for Checking the Revision Status of This Document

Rev. Nr.	Description of Changes	Prepared By:	Checked By:	Approved By:	Date:
0	Final	DOS			29-01-10

Client: Cork County Council

Keywords: Bottlehill facility, waste licence review baling, un-baled waste, environmental impacts, waste licence.

Abstract: The Environmental Protection Agency has instigated a review of the waste licence for Bottlehill landfill. This document comprises a submission by Cork County Council in relation to the engineering and environmental impacts of removing the requirement that 'primarily' baled waste would be land-filled at the site.

TABLE OF CONTENTS

	<u>PAGE</u>
EXECUTIVE SUMMARY	1
1. INTRODUCTION	2
2. LICENSEE'S SUBMISSION ON CURRENT REVIEW	3
2.1. EPA STATED INTENTION.....	3
2.2. OTHER ASPECTS OF THE LICENCE THAT, IN THE LICENSEE'S OPINION, SHOULD BE REVIEWED 3	3
2.3. SUBSTANTIVE ISSUES.....	3
3. ENVIRONMENTAL AND ENGINEERING COMPARISON OF BALED AND UN- BALED WASTE PLACEMENT	4
3.1. OVERVIEW.....	4
3.2. LANDFILL ENGINEERING FOR ENVIRONMENTAL PROTECTION.....	7
3.3. PLACING OF WASTE AT THE WORKING FACE AND ASSOCIATED SITE PLANT AND MACHINERY	8
3.4. BULK TRANSFER OF WASTE TO SITE AND ASSOCIATED LOGISTICS.....	9
3.5. MOVEMENT OF WASTE WITHIN THE SITE AND ASSOCIATED LOGISTICS.....	11
3.6. COMPACTION AND SETTLEMENT OF WASTE.....	11
3.7. LITTER MANAGEMENT.....	11
3.8. ATTRACTION TO VERMIN, INSECTS AND SCAVENGING BIRDS.....	12
3.9. NOISE.....	13
3.10. LANDFILL GAS INFRASTRUCTURE AND DECOMPOSITION OF WASTE.....	13
3.11. ODOUR MANAGEMENT.....	14
3.12. LEACHATE GENERATION AND SURFACE WATER MANAGEMENT.....	14
4. CONCLUSION	15

EXECUTIVE SUMMARY

Bottlehill Landfill was granted its waste licence in June 2004. On December 23 2009, the Environmental Protection Agency (EPA) declared its intention to review the licence in order to reduce the environmental impact of the facility by reducing the amount of biodegradable waste being landfilled. The EPA invited the licensee to make a submission in relation to the licence review. This document deals with the comparative advantages of landfilling baled and un-baled waste. It comprises part of Cork County Council's submission. As required by the EPA notification, this submission is being made in advance of 5.00 pm on February 1st 2010.

The comparative impacts of baled and un-baled waste for all operations from the waste transfer station through handling, placement and eventual waste breakdown and settlement have been reviewed.

From a commercial perspective baling imposes an additional cost on waste suppliers without any significant benefit to the environment.

From a planning perspective there is no impediment to allowing un-baled waste to be placed in Bottlehill as long as overall vehicle movements do not vary significantly. The number of vehicles is similar for baled or un-baled waste.

From a waste licence perspective there is a requirement to mitigate environmental impacts as defined under respective licence conditions, whether waste is delivered as bales or not.

There is a requirement to re-word some conditions of the licence as part of this review process. Clearly, references to waste being delivered and deposited *primarily in baled form* need to be addressed. However, with respect to protection of the environment:

- Leachate, landfill gas, surface water and groundwater management will not change
- Ecological protection measures will not change
- Similar vermin, bird and fly controls will be required in either case
- Traffic to and from the site will be similar
- Litter control measures will be enhanced for un-baled waste
- Daily cover will be more effective in the case of un-baled waste
- Noise and disturbance will not differ.

The analysis has shown that whilst management practices may need to be customised to accommodate the differing operational requirements, there will be no detrimental environmental impacts as a consequence of introducing transfer and placement of un-baled vs. baled residual waste in Bottlehill as long as best available technology and practices are employed.

The 'change' from primarily baled waste would not require any further engineering or infrastructure changes.

1. INTRODUCTION

Cork County Council has constructed the Bottlehill Waste Management Facility to accept non-hazardous waste.

The facility will be operated under Waste Licence W0161-01, issued by the EPA in June 2004.

The facility received planning permission from An Bord Pleanála in February 2004 (ABP Ref 04.EL2016).

On December 23rd 2009, the Environmental Protection Agency (EPA) gave notice of its intention to review the licence with regard to the need to implement and achieve landfill diversion targets set out in the Landfill Directive (Council Directive 1999/31/EC). The EPA also stated its intention to change other conditions (unspecified) and also to possibly add new conditions. The EPA invited the licensee to make a submission in relation to the licence review.

This document comprises Cork County Council's submission on the issue of the primacy of the land-filling of baled waste over un-baled or 'loose' waste .

For inspection purposes only.
Consent of copyright owner required for any other use.

2. LICENSEE'S SUBMISSION ON CURRENT REVIEW

2.1. EPA Stated Intention

The stated intention of the EPA is to review the licence in order to achieve landfill diversion targets as set out in the landfill directive.

2.2. Other Aspects of the Licence that, in the Licensee's Opinion, Should be Reviewed

It is Cork County Council's contention that Bottlehill Landfill and the Council's waste management practices would be better served if certain other changes were made to the conditions attached to the Bottlehill licence.

Condition 1.5.3 : "Only **baled** residual waste shall be accepted for disposal at the facility. Notwithstanding, in exceptional circumstances, particular wastes, where **baling** is not technically feasible, may also be accepted for disposal at the facility, subject to agreement by the Agency."

The licensee suggests that this condition should be considered in the current review and that it be re-worded to give equal priority to baled or un-baled waste.

2.3. Substantive Issues

The following section deals with the land-filling of baled waste compared with the land-filling of un-baled waste. In particular, the issues of environmental protection, nuisance prevention and landfill engineering are discussed.

Much of the following information was submitted to the EPA in the context of a request submitted on June 26 2009 to technically amend the existing licence (W0161-01) to permit the land-filling of waste primarily in un-baled form. That request was refused on December 15th 2009, the EPA stated that the issues would best be considered in the context of a Waste Licence Review.

3. ENVIRONMENTAL AND ENGINEERING COMPARISON OF BALED AND UN-BALED WASTE PLACEMENT

3.1. Overview

The perceived advantages of baling are:

- Structured mechanism to handle and transport residual waste from transfer stations
- Development of a structured working face and waste body
- Reduced risk of wind blown litter
- Reduced risk of scavenging birds
- High density of placed waste
- Reduced fire Risk

Waste Transport

Contemporary waste management practices surrounding the handling of un-baled waste largely neutralise the handling and transportation advantages associated with baled waste. It is now common practice to bulk-up un-baled waste in a transfer station before transporting it for disposal or recovery. The typical carrying capacity of waste transport vehicles has increased. Transfer stations have the versatility to handle wastes from a one-bin, two-bin or three-bin collection regime. Whether waste is baled or un-baled it would be transported in closed vehicles. Baling continues to be the norm for sorted recyclables such as paper, cardboard, cans, plastic film or plastic bottles.

Working Face

A structured working face and waste body is relatively easy to establish using bales however, as is demonstrated elsewhere, good compaction and daily cover coupled with site control can equal or exceed the structured nature of the landfill.

Cork County Council organised a visit by the monitoring committee to both Arthurstown and Knockharley to view modern landfill practices.

Arthurstown landfill near Kill Co. Kildare is the only dedicated baled-waste landfill in western Europe. The site was opened in 1997 as the primary landfill for the Dublin region. Waste is baled primarily at the Region's waste transfer station at Ballymount Co. Dublin. At the peak of waste production (2006), the site accepted just less than 600,000 tonnes per annum (tpa). The site currently accepts ca. 200,000 tpa. Fehily Timoney & Company (FTC) designed and managed the construction of the facility.

Knockharley Landfill in a privately-owned facility located between Slane and Ashbourne on the N2. The site opened in 2004 accepting un-baled waste both from the north-east region and from transfer stations in adjoining regions and further afield. The site is licensed to accept 200,000 tpa and currently accepts 132,000 tpa for disposal. FTC also designed and construction-managed this facility.



Photograph showing Arthurstown baled-waste landfill, waste placement machine at bottom of face, cover machine on top

For inspection purposes only.
Consent of copyright owner required for any other use.

Litter

In a modern landfill, litter blow is mitigated by close-in and perimeter netting coupled with procedures to change operational practices including suspension of operations during high winds. The perimeter netting has been installed at Bottlehill. Close-in netting comprises portable 'soccer-goal' type structures that can be moved around to suit the prevailing wind. Close-in netting is not warranted where bales are used.

Reduction/removal at source is the over-riding control. Cork County Council, through its own, Cork City Council's and other permitted collectors' efforts has been singularly successful in diverting dry recyclable material (potential litter generators) from the residual waste going to landfill. With respect to commercial MSW, enforcement of the packaging regulations continues to divert such waste from landfill. The advent of additional treatment will further reduce the litter potential of residual waste being disposed of at Bottlehill.

Bird Control

The risk of a build-up of scavenging birds is best mitigated by prompt and efficient compaction. Modern landfill compactors weigh up to 60 tonnes and when properly used, prevent access to birds and other vermin. Landfill compaction is best effected by continuous rolling in thin layers. Bird control measures will also be used to deter scavenging. Bird control is governed by Condition 7.6 of the licence and the bird control programme will be submitted to the Agency in advance of waste acceptance. The mandated measures to reduce the biodegradable nature of waste being land-filled (discussed elsewhere) will reduce the attractiveness of residual waste to birds because of the reduced food content in the waste.

Density

Maximising the density of waste as placed has numerous advantages relating to stability, settlement, landscaping, litter control, vermin control, fire control and odour management (all discussed later). The density achieved by the modern landfill compactor land-filling un-baled waste cannot be achieved with bales. That is because of the 'kneading' effect achieved by the landfill compactor. It is worth noting that (Arthurstown excepted) at the only other baled waste facility that existed in Europe at the time when the original WLA was made, the bales were broken on delivery so that effective density could be reached in the landfill. This procedure was witnessed in 2003 by FTC and Cork County Council personnel when visiting Glasgow City Council's Landfill.

Fire Risk

While, traditionally, landfill fires were commonplace in un-regulated non-compacted landfills, in the modern context, they are a thing of the past. In almost two decades of landfill engineering, FTC has no experience of landfill fires in modern contained landfills (whether baled or loose waste). Landfill fires are prevented by oxygen deprivation. Good compaction at the waste face is key and is best achieved using a landfill compactor. Paradoxically, while baled waste is delivered at a relatively high density, immediately after placement and compaction, density is easier to achieve with un-baled waste.

The primary disadvantages associated with baling are:

- Achievement of standardised size and density of bales can be difficult resulting in a less-stable waste mass.
- There is a significant additional cost imposed on suppliers of baled waste such that waste hauliers are encouraged financially to travel further afield to landfill sites where baling is not required. This is contrary to the 'proximity principle'.
- Impact on the operator's ability to market/sell void space because of the premium attached to baling.
- As discussed above, the density of waste as placed in the landfill is less than that achieved using modern compactors on loose waste

The issues surrounding land-filling, whether it be baled or un-baled can be summarised under the following headings

- Landfill engineering for environmental protection
- Placing of waste at the working face, and associated site plant and machinery
- Bulk transfer of waste and associated logistics
- Movement of waste within the site and associated logistics
- Compaction and settlement of waste
- Litter management
- Attraction of vermin, insects and scavenging birds
- Noise
- Landfill gas infrastructure and decomposition of waste
- Odour management
- Leachate generation and surface water management

3.2. Landfill Engineering for Environmental Protection

The essence of landfill engineering is environmental protection, specifically:

- The protection of soil and water from the effects of landfill gas and leachate.
- The prevention of gas or leachate migration outside of the site
- Nuisance prevention

The EU standard for the protection of health and the environment is set down in Annex 1 of Council Directive 99/31/EC on the Landfill of Waste.

Engineering of the landfill cells is independent of the nature of the waste being deposited. For all non-hazardous waste landfills the lining standard is the same, comprising a composite of membrane liner and specified clay.

- The liner specification at Bottlehill is identical to that for all other modern (Council Directive-compliant) MSW landfills. It was not altered in any way to accommodate baled waste.
- The cell sizes and side-slope gradients were designed based on water balance and side-slope stability with no regard to whether the waste was to be baled or un-baled.
- In common with similar modern landfills for un-baled waste, the leachate drainage layer at Bottlehill comprises a 500 mm thick layer of drainage medium comprising stone and drainage pipe-work.
- The internal access roads at Bottlehill are built to a standard that exceeds the industry norm and are equally suitable for baled or un-baled waste
- Waste reception and weighing methods are common to both waste types.

Transport of waste within the site can be effected by direct delivery to the waste face. The infrastructure is designed so that the vehicles can deliver directly. However, if the council wishes to decouple road going trailers from the traction units and use a site-going vehicle to deliver to the face, a marshalling yard has been provided to allow the manoeuvre to take place.

There is only one landfill in Western Europe where such a manoeuvre is practiced, that is Arthurstown, Co.Kildare where containerised baled waste is delivered to site and the containers are transferred to-site going ejector vehicles which deliver the waste to the working face.

In essence, whether waste is delivered in loose or baled form will have no influence on the use of engineering infrastructure as constructed.

3.3. Placing Of Waste at the Working Face and Associated Site Plant and Machinery

Waste placement at the face requires development of a working face to a limited height and width. This condition applies to both baled and un-baled waste options.

3.3.1. Baled Waste

When placing baled waste, bales will be delivered to the base of the waste face and will be built up as one would build a brick or block wall.

Handling of bales requires a 20 to 30 tonne tracked excavator with a grab to pick up and place bales. Compaction of the waste is typically effected by subsequent trafficking during delivery and placement of waste on subsequent 'lifts' of waste bales. However the Glasgow City Council experience would favour the use of a landfill compactor which is designed to maximise wheel loads whereas tracked excavators are designed to achieve the exact opposite.

As previously stated, before abandoning baling altogether, Glasgow City Council adopted a procedure where bales were broken before being compacted into the landfill as loose waste. The licence already permits the deposition of un-baled waste (Condition 1.5.3) where baling is not technically feasible. Thus a landfill compactor will be required on site in any event.

The advantages in placing baled waste include:

- Definition of a clean working face that can be easily covered with vertical plastic sheeting that does not impact on future leachate recirculation if left in place
- A clean upper edge that facilitates daily cover placement which becomes an advantage where waste rates are very low, i.e. less than 25,000 tonnes per annum.
- The ability to work from the bottom-up allows separation of gas management operations and waste placement daily cover such that it does not interfere with the waste placement operation.

The disadvantages of baled waste are:

- By definition there has to be a vertical face. It is not possible to place odour-absorbing daily cover on a vertical face.
- Initially the waste density is lower than un-baled waste compacted by 40 to 60 tonne compactors. There will be gaps between bales, thus rainfall can short-circuit the waste leaving it un-hydrated and reducing biological breakdown.
- Differential settlement can be more pronounced giving rise to long-term stability issues and the need to re-visit and re-engineer the restored cap.

- The compaction effort, be it from subsequent waste-placement or the use of a landfill compactor, is lessened because bales tend to be stacked 4-high, equating to approximately a 4 m depth, which renders any compaction effort virtually useless.

Un-baled Waste

When placing un-baled waste, the preferred method is to tip and blade waste into position from the top of the waste face. The 'blade' is mounted on the landfill compactor which compacts the waste as it is placed.

Placement of un-baled waste requires a compactor (typically 40 to 60 tonnes) with a blade to push waste. Typically, waste is bladed in 0.3 m layers, however the first layer overlying the drainage medium would be thicker (1 to 2 m) to reduce impact on the underlying lining system. This is standard practice.

The advantages in placing un-baled waste are

- The system is better suited to immediate placement of soil, compost or wood chip daily covers
- Waste density following placement is greater

The disadvantages in placing un-baled waste are

- The face is less defined however, good site practice will achieve the same or better 'face definition'
- There is a need for rigorous litter control measures including netting both at the cell perimeter and close to the working face.
- There may be disruption when filling is suspended during high wind events.

In summary, both baled and un-baled waste requires different types of machinery for efficient and effective placement. Achievement of maximum possible compaction requires, in the case of baled waste, both a compactor and a backhoe-type machine fitted with a grab. Un-baled waste requires a compactor supported by a daily-cover placement machine only.

3.4. Bulk Transfer of Waste to Site and Associated Logistics

Waste in the Cork region will typically be collected in 2-bin systems by refuse trucks operated by private or local authority operators. Waste will be either delivered directly to the Landfill (currently, the only MSW landfill in the county is at Youghal WL0068-02) or deposited in one or more waste transfer stations.

Giving effect to the EPA policy as set down in 'Municipal Solid Waste – Pre-treatment & Residuals Management' will prevent any waste going to landfill without intermediate treatment of the second bin or else the provision of a third bin.

Whether waste is baled or un-baled, the logistics are similar. Waste will be transported to site in enclosed vehicles. Each vehicle will carry up to 23 tonnes (this is typical in Ireland or the UK and is limited by the permissible highway axle loads

[S.I. 5 2000]. While, depending on the axle configuration, the gross vehicle weight may be ca. 40 tonnes, the vehicle self-weight limits the payload to ca 23 tonnes. A payload of 20 tonnes is quoted in the EIS thus, whether baled or un-baled waste is delivered, the number of vehicle movements is now likely to be less than was originally estimated.

In each case, the vehicles will be enclosed and the contents are off-loaded, not by tipping but by ejection using either a hydraulic ram or a 'moving floor'. The number of truck movements will thus be similar whether the waste is baled or un-baled. Bulk transfer of un-baled waste would avail of vehicles that are readily available to all waste contractors. All vehicles used for transport of waste to site will be industry-standard vehicles. Tipper trailers will not be used.

Bales, where used, will be loaded onto trailers using either a hydraulic ram or a fork-lift/grab machine.

3.4.1. Baled Waste Transfer to the Bottlehill Site

Baling of waste requires

- A transfer area where refuse collection vehicle can tip waste onto a floor in an enclosed building
- A hopper, typically fed by a front end loader into which waste is placed
- A baling unit which compresses bales and ties the waste into *cubic* shape. Wire is typically used to tie the bales
- A bale storage area
- A loading facility where bales are loaded into sealed articulated trailers
- Leachate collection and disposal facilities

Upon completion of this operation waste can be hauled to the Bottlehill landfill facility.

3.4.2. Un-baled Waste Transfer to the Bottlehill Site

Un-baled waste transfer requires:

- A transfer area where refuse collection vehicles can tip waste onto a floor in an enclosed building
- A loading facility where waste is loaded, typically by a front end loader or purpose designed grab machine into covered articulated trailers
- Leachate collection and disposal facilities
- Where, by its nature, the waste requires treatment prior to land-filling, the transfer station may be part of a materials recovery facility (MRF)

Both transfer mechanisms allow for waste inspection prior to transport to the landfill. Landfilling un-baled waste permits final inspection at the waste face.

3.5. Movement of Waste within the Site and Associated Logistics

On arrival, waste vehicles will travel over a weighbridge where data will be recorded in relation to source, type and weight. The weighbridge operator will then allow the vehicle to enter the site and proceed either to:

- The quarantine area if waste needs to be analysed or checked or
- Directly to the waste face

Given that all of the waste will have been loaded in a licensed or permitted facility, the use of the quarantine area is likely to be minimal.

Waste will be placed as previously described.

3.6. Compaction and Settlement of waste

Following placement and compaction in the landfill, un-baled waste will have a higher density in the short term.

Baled waste will be positioned by a grab possibly augmented by a landfill compactor. Gaps between bales left during placement will be closed only once significant surcharge is applied from subsequent layers over an extended time period.

Long term settlement of both baled and un-baled waste will be similar. However the final settled profile will be achieved earlier by loose waste placement followed by effective compaction. The effectiveness of the compactor on baled waste is lessened by the bale thickness (compacted layer), loose waste would be compacted in layers approximately 0.3 m thick.

From an engineering perspective, the achievement of higher density in the short-term is an advantage with respect to placement of the final cap. It will be possible to cover the waste with an engineered cap including barrier layers, subsoil and topsoil, earlier in the case of un-baled waste. Effective compaction of un-baled waste will result in less differential settlement when compared with baled waste or baled waste combined with un-baled waste (as currently licensed).

3.7. Litter Management

Baling of waste reduces the potential for litter arising as waste is being placed. For that reason, there is no litter netting at Arthurstown. At Bottlehill, nets installed at the cell perimeter are designed to capture all litter escaping from either baled or un-baled placed waste. Furthermore, as an operational procedure, 'close-in' netting will be used where waste is predominately un-baled. The use of perimeter and 'close-in' litter netting is a proven measure to mitigate any risk of litter nuisance.

Modern landfills (including Bottlehill) have weather stations that are used to inform the staff as to when adverse wind conditions warrant temporary closure or movement of the working face to a lower elevation within the landfill. The approach on other sites is precautionary, the operators soon learn what particular wind conditions (wind-strength and direction) mandate action.

While only one face would be active at any one time, the operator has a choice that can be made on a day-by-day basis.

With respect to road transport, litter is not an issue whether the waste is baled or un-baled as all trucks will be fully enclosed.

The litter potential from waste arising in the Cork Region has greatly reduced since the time when the original EIA was carried out. The introduction of a second bin for dry recyclables coupled with the success of the waste packaging regulations has removed a large proportion of plastic and paper that would otherwise increase the potential for litter.

3.8. Attraction to Vermin, Insects and Scavenging Birds

There is no evidence to suggest that vermin or insect infestation is influenced by the use or otherwise of baling.

With respect to bird control, if daily cover is effected using best practice then both placement systems are very similar. One potential disadvantage, as stated earlier, on a baled site is the inability to implement immediately daily cover at the vertical face which can, depending on daily cover material selected, be more restrictive and so lead to operational issues.

Assuming that modern landfill compaction and daily cover are employed there is no additional attraction to birds to a well managed un-baled MSW landfill. Indeed the increased potential for compaction reduces the availability of food that is the primary attraction for birds

In summary baling and un-baled waste placement have similar environmental impacts in relation to vermin, insects and scavenging birds.

Vermin control and the measures adopted will be similar for both baled and un-baled waste. Similar bird and vermin controls are practised at large-scale landfills such as Arthurstown (baled) and Knockharley (un-baled).

The removal at source of the organic fraction of municipal waste will reduce the attractiveness to vermin, birds and insects.

3.9. Noise

Landfilling of bales requires more machinery. As a minimum, both a bale-placement machine and a landfill compactor will be required, the latter for the already permitted loose waste and also to augment bale placement.

If the stillages/container-transfer was to be adopted (as at Arthurstown) then further site-going vehicles would be required, all contributing to noise generation.

3.10. Landfill Gas Infrastructure and Decomposition of Waste

An inevitable consequence of decomposition of waste under anaerobic conditions is the production of landfill gas including methane, carbon dioxide and trace odorous compounds. Gas is managed by landfill gas infrastructure including collection wells, collection pipe-work, gas transport pipe-work, gas pumps, flares and gas utilisation engines

Decomposition of waste under anaerobic conditions is impacted by availability of moisture and its ability to reach all waste.

Once the waste is placed its method of deposition has little influence on how it behaves in the landfill. It can be argued that the 'preferential pathways' arising by virtue of the 'joints' between the bales cause short-circuiting of leachate and rainfall directly to the base of the cells. However, the action of machinery surcharge from overlying waste will tend to close the 'joints'. In the case of Arthurstown it is evident that decomposition has not been influenced negatively by the use of baling. In fact, actual landfill gas production at Arthurstown is higher than that predicted by conventional models.

In either case, decomposition of the waste will be influenced and managed by controlled recirculation of leachate under the cap as permitted in accordance with Condition 5.11.6 of the licence.

Gas collection pipe-work and gas wells are easier to install in the case of a baled waste landfill, that is because gas pipe-work can follow the horizontal and vertical grid network that results from the placement of bales however, the landfill industry and its support services are geared-up to install such infrastructure in un-baled landfills.

Landfill gas and waste decomposition will be influenced by the proportion of biodegradable waste being land-filled. This is independent of whether waste is transported in baled or un-baled form.

3.11. Odour Management

Landfill odour potentially arises either from waste as-delivered or from trace elements arising from the generation of landfill gas. Efficient and rapid placement combined with proper choice/use of daily cover is the most effective mitigation for fresh-waste odour.

As odour arises primarily from the decomposition of putrescible waste, implementation of the Landfill directive targets will reduce the potential for odour, whether from baled or un-baled waste.

3.12. Leachate Generation and Surface Water Management

Leachate and surface-water generation are a function of cell area. Whether the landfill is managed as loose waste only or as a combination baled waste/loose waste landfill (as currently permitted), there is no reason that leachate or surface water generation will be affected.

*For inspection purposes only.
Consent of copyright owner required for any other use.*

4. CONCLUSION

The comparative impacts of baled and un-baled waste for all operations from the waste transfer station through handling, placement and eventual waste breakdown and settlement have been reviewed.

From a commercial perspective baling imposes an additional cost on waste suppliers without any significant benefit to the environment.

From a planning perspective there is no impediment to allowing un-baled waste to be placed in Bottlehill as long as overall vehicle movements do not vary significantly. The number of vehicles is similar for baled or un-baled waste.

From a waste licence perspective there is a requirement to mitigate environmental impacts as defined under respective licence conditions, whether waste is delivered as bales or not.

There is a requirement to re-word some conditions of the licence with as part of this review process. References to waste being delivered and deposited *primarily in baled form* need to be addressed. However, with respect to protection of the environment:

- Leachate, landfill gas, surface water and groundwater management will not change
- Ecological protection measures will not change
- Similar vermin, bird and fly controls will be required in either case
- Traffic to and from the site will be similar
- Litter control measures will be enhanced for un-baled waste
- Daily cover will be more effective in the case of un-baled waste
- Noise and disturbance will not differ.

The analysis has shown that whilst management practices may need to be customised to accommodate the differing operational requirements, there will be no detrimental environmental impacts as a consequence of introducing transfer and placement of un-baled vs. baled residual waste in Bottlehill as long as best available technology and practices are employed.

The 'change' from primarily baled waste would not require any further engineering or infrastructure changes.

APPENDIX 1

Summary Matrix Comparing Landfilling of Baled and Un-baled Waste

*For inspection purposes only.
Consent of copyright owner required for any other use.*

	Issue*	Baled Waste	Un-baled waste
1	Bulk transfer of waste to site	Transported via a baling station in fully-enclosed vehicles.	Delivered in fully-enclosed vehicles
2	Movement of waste within the site	Road-going trailers will be weighed and moved to waste face using where waste bales will be off-loaded using grab	Road-going trailers will be weighed and moved to waste face using where waste will be ejected
3	Waste placement	Waste placed with grab and compacted both by unloading plant and waste compactor	Waste spread and compacted using a waste compactor, likely to be in excess of 50-tonne weight.
4	Litter control	Less likelihood of litter blow however netting is nonetheless in place	Litter blow needs to be controlled using nets, and specific practices in high winds
5	Landfill gas	The quantity and nature of landfill gas will depend on the putrescible nature of the waste and its moisture content, not on whether it is baled.	The quantity and nature of landfill gas will depend on the putrescible nature of the waste and its moisture content, not on whether it is baled.
5	Surface water emissions	No influence	No influence
6	Groundwater Emissions	No influence	No influence
7	Leachate management	No influence	No influence
8	Vermin	Compaction-related issue, during transport and placement, less access to vermin.	Compaction-related issue, immediate and effective compaction vital resulting in less access to vermin
9	Dust	Transport-related dust the same, construction-related dust same, less likely to be dust blown from waste face.	Transport-related dust the same, construction-related dust same, possible dust blow as waste is placed in windy conditions. Mitigation easy using fine-mist spray and other operational controls as required
10	Birds	Compaction-related issue, during transport and placement, less access to birds. Daily cover vital, may be more difficult because of vertical faces	Compaction-related issue, immediate and effective compaction vital to reduce attractiveness to birds. Daily cover vital.
11	Noise	No influence, if there was no baled waste, possibly one less machine	No influence, waste compacter will be largest plant item.
12	Compaction and settlement	More difficult than with un-baled waste	Compaction more effective