

Environmental Protection Agency  
Headquarters  
P.O. Box 3000  
Johnstown Castle Estate  
County Wexford



Wednesday, 17 October 2007

Dear Sir

**Re: EPA Waste Licence Proposed Decision in Respect of Proposed New Landfill at Tooman/Nevitt, North County Dublin.**

**Fingal County Council.**

**Waste Licence Register Number: W0231-01.**

This submission is made on behalf of Hakaton Limited of The Warehouse, Barrow Street, Grand Canal Dock, Dublin 4 in relation to issuing of a Proposed Decision in respect of a proposed new landfill at Tooman / Nevitt, North County Dublin by the Environmental Protection Agency (Waste Licence Register Number W0231-01).

Hakaton Limited is the developer of lands to the north and east of the site of the proposed landfill around what is known as the Courtlough interchange on the M1 motorway. The lands and the development thereon are collectively known as the "M1 Business Park".

**"M1 Business Park"**

The designation of the lands for development was in accordance with the objective of Fingal County to capture economic development in the county in the rapidly growing strategic Dublin-Belfast Economic Corridor. This objective was incorporated in the 1999 Development Plan.

The stated policy of Fingal County Council in relation to the Economic Corridor was and still is to maximise economic growth and sustainable employment opportunities arising from development of the Corridor for the benefit of the population of the County. To this end, paragraph 3.1.3 of the 1999 Fingal Development Plan referred to Specific Objectives for development along the Economic Corridor. In this regard, the Courtlough Interchange was described as being 'uniquely positioned' in that its location provides for:

*'a unique opportunity for the location of development directly adjoining the motorway of facilities associated with the Dublin - Belfast Economic Corridor, motorway services and a major service facility for the rural area'.*

The Business Park is therefore a strategic high-profile employment zone within the county and region and its development reflects the aspirations of the County Council.

## ***Planning History***

The land that Hakaton Limited is developing around the Courtlough interchange has a long and involved planning history, the salient matters of which are integral to the appreciation of the background to this submission.

Under the Fingal County Development Plan 1999, a total of 66 hectares of land in six distinct parcels located around the interchange were zoned for development. The zoning objectives attached to the lands sought variously to facilitate opportunities for light industrial employment in a high quality landscaped environment, for science and technology based employment and associated and complementary uses in a campus style environment, and for industrial employment and related uses. The development plan also contained a number of specific objectives to seek the provision of a warehouse and distribution centre, a motorway services area and a national fruit and vegetable market within the development.

Of greater significance however was the requirement under two of the zoning objectives that development had to occur in accordance with an approved action area plan. In conjunction with the County Council, Hakaton Limited produced a detailed action area plan that was approved by the County Council in January 2001. The conclusion of the process was a Framework/Masterplan for the development of the lands that set out matters such as indicative land uses on each land parcel, building set backs and heights, access and infrastructure provision, architecture and landscape design and phasing of development.

Subsequent to the agreement of the action area plan five planning applications were made between April and July 2001 for development on each of the land parcels and for the provision of the primary infrastructure to serve the development as a whole (water, supply, foul water drainage and road improvements including the upgrade of the motorway interchange).

## ***Nature and Scale of Development***

The approved action area plan for the development of the lands sets out the nature of development that can be undertaken on the sites and the scale that it should take given the physical parameters set out in the plan.

As a consequence of the building set backs and heights and access arrangements, the overall quantum of development that would be achievable on the lands subject to compliance with the required design criteria is in the order of 223,310 sq. m. The nature of the Courtlough developments is such that upwards of 3,500 people could be employed in the area. Some of these uses, particularly within the science and technology based category are characterised by high value organisations who require and can demand the highest quality of facilities and environment in which to operate. The design criteria and framework plan within the approved action area plan stress the need for quality in terms of design, uses and landscaping across the sites and this has been reflected in the development that has been approved to date.

In the Human Beings section of the EIS estimates of population within 3 kilometres of the proposed facility and the presence of schools and other community facilities are made. However, the quantum of development and the potential working population of the Business Park and the impacts arising from the facility are not recognised in the assessment. We submit that this should have been incorporated into the assessment.

Hakaton Limited commissioned AWN Consulting Limited of The Tecpro Building, Clonshaugh Business and Technology Park, Dublin 17 to review the Air Quality and Climate Sections of the EIS prepared by the applicant. The conclusions of this review are set out hereunder.

It is submitted that the proposed landfill will have significant and potentially adverse impacts on the development that has taken place on the M1 Business Park lands and on development that is programmed in the future. It is on this basis that this submission is made.

### ***Impacts arising from Air Quality***

The Waste Licence Application predicts that there would be no significant impact on air quality or odour within the vicinity of the proposed landfill. This conclusion is based on a detailed odour modeling assessment which was undertaken as part of the EIS. The modeling assessment is technically robust and has used an appropriate dispersion model (AERMOD), detailed terrain (AERMAP), appropriate meteorological data (AERMET) and has identified all suitable receptors in the region. The model also takes into account the specific operations of the facility in some detail and breaks down the operation of the facility into the relevant phases with a focus on three worst-case years.

Some pertinent comments are outlined below regarding some conclusions from this assessment.

- In terms of the applicable odour annoyance criteria for landfills, the applicant indicates that landfills might be viewed in odour terms as somewhere between intensive agricultural facilities and abattoirs and thus a suitable annoyance criteria may fall somewhere between these two types of operations (Page 118 of EIS). However, the UK IPPC H4 Technical Guidance<sup>(1)</sup> indicates (in Table A1.1 of the publication) that, in the UK, landfills are considered the most offensive odour source (and more offensive than abattoirs). The applicable standard for landfills is therefore  $1.5 \text{ Ou}_E \text{ m}^{-3}$  (as a 98<sup>th</sup> percentile) as outlined in Appendix 6 of the IPPC H4 Technical Guidance (Table A6.1). The use of the  $1.5 \text{ Ou}_E \text{ m}^{-3}$  (as a 98<sup>th</sup> percentile), which has been applied in the assessment, should be viewed as appropriate rather than a worst-case approach.
- Section 3.4.4.3 of the EIS (as shown in Table 3.4.16) outlines the specific odour emission rate/flux for each proposed operation of the landfill. The specific odour emission rate is a critical data input which will, to a large extent, determine the magnitude of the odour impact. The data is likely to have been derived from an in-house library database of existing measurements at landfills in Ireland which is the standard approach in deriving odour emission factors. No mention is made in the text as to whether the data is typical or worst-case data. The absence of any mention of "worst-case" may lead one to assume that the data used was based on typical values.
- A review of the odour modeling results indicates that Year 15 of operations leads to the  $1.5 \text{ Ou}_E \text{ m}^{-3}$  (as a 98<sup>th</sup> percentile) contour approach (to within 100m) several receptors to the east of the site (in the region of Jordanstown as shown in Figure 3.4.3 of the EIS). The conclusion that no odour impact will occur at these receptors may instil a greater degree of confidence in the air dispersion model than would seem to be warranted. In terms of model accuracy, USEPA Guidance<sup>(2)</sup> states that "errors in highest estimated concentrations of  $\pm 10$  to 40 percent are found to be typical". The Guidance goes on to state that "estimates of concentrations that occur at a specific time and site, are poorly correlated with actually observed

concentrations and are much less reliable<sup>(2)</sup>. As the odour impact assessment is concerned with impacts at discrete receptors, rather than attempting to quantify the highest concentration anywhere, the model is likely to perform to a lower degree of accuracy than the quoted  $\pm 10$  to 40 percent.

- Due to the inherent inadequacy in any air dispersion model, it may have been prudent to undertake a conservative assessment by using worst-case odour emission rates. The current assessment appears to have adopted realistic values for the odour emission factors rather than worst-case levels. If a sensitivity study was to be applied to the emission factors (by increasing them by 50%) then during Year 15 there would likely be exceedences of the odour annoyance criteria in the region of the residential receptors close to Jordanstown and adjoining areas. In the absence of detailed information on each phase of the project, it is not possible to indicate how many of the other phases may be susceptible to this form of sensitivity analysis.

#### References

- (1) Environment Agency (2002) IPPC Draft Horizontal Guidance for Odour Part 1- Regulation and Permitting.
- (2) USEPA (2005) Guidelines on Air Quality Models, Appendix W to Part 51, 40 CFR Ch.1

#### Climate

The climate chapter of the EIS indicates the likely landfill gas generation rates from the landfill. The landfill gas generation rate will peak at between 3,000 m<sup>3</sup>/hr and 5,900 m<sup>3</sup>/hr depending on the fraction of waste which is biodegradable. However, the chapter does not quantify the greenhouse gas emissions associated with the release of this landfill gas. Thus it is not possible from the information provided to assess whether or not the development will be significant in the context of Ireland's obligation under the Kyoto Protocol.

The chapter also fails to extend the study to investigate whether landfilling is a more favourable waste disposal option from a climatic perspective in comparison to the alternatives waste treatment options which are available such as incineration.

Based on the information provided in the EIS, and assuming the waste breakdown as provided in the Waste Management Plan For The Dublin Region (2005)<sup>(1)</sup> a direct comparison between incineration and landfilling of 300,000 tonnes of MSW using the 2006 IPCC methodology<sup>(2)</sup> has been undertaken in order to determine the actual climatic impact of the proposed facility relative to incineration. The period assessed is 2012 - 2030 when the landfill is assumed to accept 300,000 tonnes per annum.

The following assumptions have been made:

- The displaced fuel is the 2012 average fuel mix as a starting point in the calculations and with the fuel mix decreasing, reaching 33% renewables by 2020 and stabilising in 2028 at 0.40 tonnes CO<sub>2</sub> eq / MWe which is equivalent to the emissions from a CCGT power plant. As the energy generation from landfilling is much smaller than incineration, for simplicity, no adjustment in future years is made for the displaced energy from landfilling. This assumption will benefit the landfill option.

- In relation to the landfill gas capture rate, the 2006 IPCC guidance states that a default value of 20% should be used due to the many uncertainties in using the methodology. This is in line with recent literature which was highlighted in the Eunomia publication "A Changing Climate For Energy From Waste? (2006)"<sup>(3)</sup>. The publication indicates that Dutch field measurements are measuring average rates of 25% whilst recent data from the USA is approximately 19% over the lifetime of the landfill although instantaneous levels may well be much higher than this. Default values of 70% - 85% for landfill gas capture rates are common in the literature and thus are likely to have under-estimated the impact of landfilling on climate change. Nevertheless, for the current comparison a level of 75% landfill gas capture rate (which is equivalent to 85% gas capture during the operational lifetime of the facility) as recommended by the USEPA has been used.

Table 1 below outlines the CO<sub>2</sub> eq emissions from the landfilling of 300,000 tonnes of MSW in 2012.

**Table 1: CH<sub>4</sub> Emissions From Landfilling of 300,000 tonnes of MSW (tonnes CO<sub>2</sub> eq) / annum in 2012.**

Waste Type	Tonnage of Waste (based on 300,000 tonne facility) <sup>(1)</sup>	Degradable Organic Content <sup>(2)</sup>	Methane Generation Rate (k) (year <sup>-1</sup> ) <sup>(2)</sup>	Tonnes CO <sub>2</sub> eq / 300,000 Tonnes of Waste <sup>(3)</sup>
Organics	89,100	0.15 - 0.2	0.10 - 0.185	24,368
Paper & Cardboard	92,400	0.0	0.06	57,368
Other biodegradables	28,350	0.24 - 0.43	0.03 - 0.06	8,947
Inerts	90,150	0.0	0.0	0.0
<b>Total CO<sub>2</sub>eq Emissions/ annum</b>				<b>90,683</b>
<b>Total CO<sub>2</sub>eq Savings Due To Power Generation / annum</b>				<b>6,600<sup>(4)</sup></b>
<b>Nett CO<sub>2</sub>eq Emissions / annum</b>				<b>84,083</b>

- (1) Data from National Waste Database 2005 & Dublin Waste Management Strategy and corrected for 165,000 tonnes of organic / paper waste (90:10) which will be biologically treated in the Dublin Region.
- (2) Defaults as outlined in the 2006 IPCC Guidelines for National Greenhouse Gas Inventories (IPCC, 2006)
- (3) Emissions occur over 80 years but have been compressed to the period 2012-2030.
- (4) Based on the EU default value of 0.022 tonnes CO<sub>2</sub> eq / tonnes MSW

Table 2 below outlines the anthropogenic CO<sub>2</sub> emissions from Incineration of 300,000 tonnes of MSW in 2012.

**Table 2: Anthropogenic CO<sub>2</sub> Emissions From Incineration of 300,000 tonnes of MSW (tonnes CO<sub>2</sub> eq) in 2012.**

Waste Type	Tonnage of Waste (based on 300,000 tonne facility) <sup>(1)</sup>	Carbon Content %C (Dry)	% Fossil Carbon	Fossil CO <sub>2</sub> tonne/tonne	Tonnes CO <sub>2</sub> eq / 300,000 Tonnes of Waste
	a	b	c	=a*b*c*44/12	
Plastics	43,800	51% <sup>(2)</sup>	100%	0.51*1.0*44/12	81,906
Textiles	20,700	50%	50%	0.50*0.50*44/12	18,975
Others	31,200	50% <sup>(3)</sup>	50% <sup>(3)</sup>	0.50*0.50*44/12	28,600
<b>Total CO<sub>2</sub> Emissions / annum</b>					<b>129,769</b>
<b>Total CO<sub>2eq</sub> Emissions / annum</b>					<b>133,742</b>
<b>Total CO<sub>2eq</sub> Savings Due To Power Generation / annum</b>					<b>121,111<sup>(4)</sup></b>
<b>Nett CO<sub>2eq</sub> Emissions / annum</b>					<b>12,631</b>

- (1) Data from National Waste Database 2005 & Dublin Waste Management Strategy and corrected for 165,000 tonnes of organic / paper waste (90:10) which will be biologically treated in the Dublin Region.
- (2) Fossil fuel fraction recommended in the UK. Retained in the recent publication by ERM for DEFRA (Dec 2006) "Carbon Balances & Energy Impacts of the Management of UK Wastes".
- (3) In the absence of a detailed breakdown of the "Others" waste, 50% carbon fraction and 50% fossil fuel content is deemed reasonable.
- (4) Based on a calorific value of waste of 10.5GJ/tonne and a net power efficiency of 29% leading to a net power output of 26.7MW.

## Results

Assuming the displaced fuel is the 2012 average fuel mix as a starting point and with the fuel mix decreasing up to 2028 and stabilising in this year at 0.40 tonnes CO<sub>2</sub> eq / MWe which is equivalent to the emissions from a CCGT, the time series indicates that incineration is more favourable than the proposed landfill in all years. The results are summarised in Table 3 and shown in Figure 1:

Figure 1- Incineration v Landfill of 300,000 Tonnes of MSW

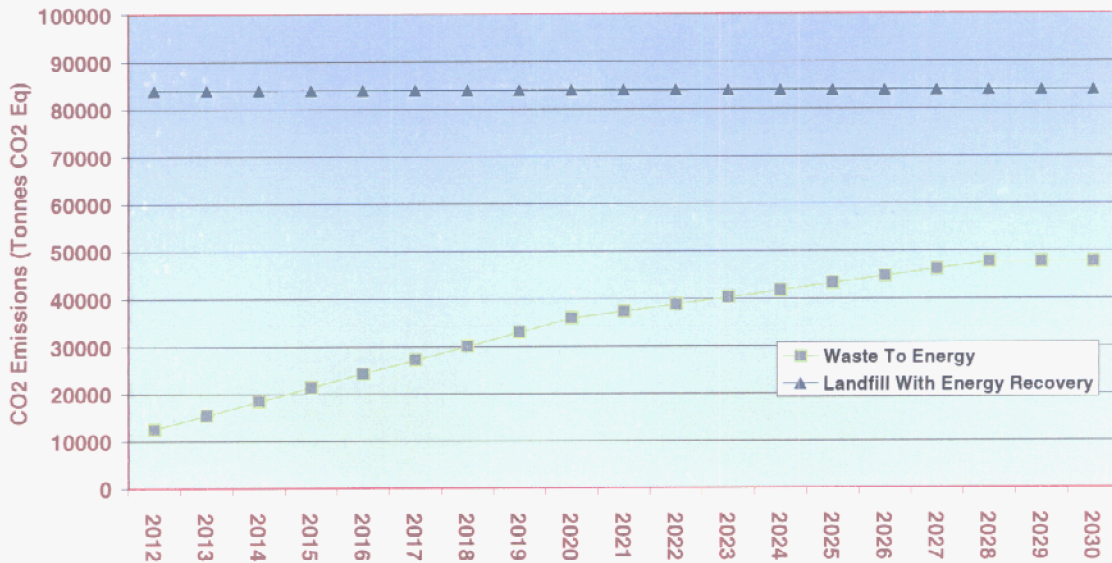


Table 3: Anthropogenic CO<sub>2eq</sub> Emissions: Incineration vs Landfilling of 300,000 tonnes MSW (tonnes CO<sub>2</sub> eq).

	2012	2030	Overall
Incineration	12,631	47,650	654,380
Landfilling	84,033	84,032	1,596,600
Balance	-71,402	-36,381	-942,220
% of Kyoto Target <sup>(1)</sup>	-0.11%	-0.06%	-0.08% <sup>(2)</sup>

(1) 2008 - 2012 Kyoto Target is 620,32 Mt CO<sub>2</sub> Eq.  
 (2) On an annualised basis.

**Summary**

Using the 2006 IPCC guidelines<sup>(2)</sup>, incineration of MSW is a better climatic option than the landfilling of this waste. In terms of the Kyoto targets, landfilling will release an additional 0.08% of the Kyoto Target on average over the period 2012 - 2030 or approximately an additional 50,000 tonnes of CO<sub>2eq</sub> per annum.

**References**

- (1) Dublin Local Authorities Waste Management Plan For The Dublin Region 2005 - 2010 (2005)
- (2) IPCC 2006 IPCC Guidelines for National Greenhouse Gas Inventories (2006)
- (3) Eunomia Consulting A Changing Climate For Energy From Waste? (2006)

**Conclusion**

I trust that the above sets out our client's concerns regarding the proposed facility. We would welcome the opportunity to present and expand on these concerns at any Oral Hearing into the Agency's proposed decision to grant a Waste Licence for the proposed facility and would be wished to be advised of the decision to hold such a hearing.

Yours faithfully



**Ian McGrandles**  
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**Tiros Resources Limited**

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