



NON TECHNICAL SUMMARY

KILMAINHAMWOOD COMPOST FACILITY EXTENSION BALLYNALURGAN, KILMAINHAMWOOD, KELLS, CO. MEATH

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May 2010

TOBIN CONSULTING ENGINEERS



REPORT

PROJECT: **Application for Extension of Existing Composting Facility at Kilmainhamwood, Co. Meath**

CLIENT: **Thorntons Recycling**
Unit S3B Henry Road
Parkwest Business Park
Dublin 12

COMPANY: **TOBIN Consulting Engineers**
Block 10-4
Blanchardstown Corporate Park
Dublin 15

www.tobin.ie

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DOCUMENT AMENDMENT RECORD

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Project:	Application for Extension of Existing Composting Facility at Kilmainhamwood, Co. Meath
Title:	Non Technical Summary – Waste Licence Application

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TABLE OF CONTENTS

1	INTRODUCTION	1
2	EXISTING SITE AND PROPOSED DEVELOPMENT	4
3	ALTERNATIVES	15
4	POLICY, PLANNING AND DEVELOPMENT CONTEXT	17
5	HUMAN BEINGS/SOCIO ECONOMIC	19
6	FLORA & FAUNA	20
7	SOILS/GEOLOGY & HYDROGEOLOGY	22
8	WATER	24
9	AIR QUALITY AND CLIMATE	28
10	NOISE AND VIBRATION	34
11	LANDSCAPE AND VISUAL IMPACT	37
12	CULTURAL HERITAGE & ARCHAEOLOGY	38
13	TRAFFIC & ROAD ASSESSMENT	39
14	INTERACTION OF THE FOREGOING	41

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1 INTRODUCTION

1.1 GENERAL

The facility is currently licensed to process 20,800 tonnes of biodegradable waste per annum. The high quality compost produced is used as a soil conditioner in commercial agriculture, as material for landscaping, as organic soil conditioner or as a custom growing media. The facility has been operational since September 2006. Thorntons Recycling proposes to extend the existing facility to accept and treat up to 40,000 tonnes of biodegradable waste per annum.

The location of the composting facility in relation to the surrounding regional setting is shown on Figure 1.

The construction activities for the proposed development include:

- Extensions to the existing facility buildings;
- Facility administration building in the form of offices, tea station, toilets and showers; and
- Other works required to integrate the proposed extensions and facility administration building into the existing facility.

1.2 SITE LOCATION AND BACKGROUND

The existing composting facility is located on a landholding in the townland of Ballynalrgan, approximately 4km south of Kingscourt, Co. Cavan and 6km northwest of Nobber, Co. Meath. The R162 regional road runs to the south and southwest of the site. Access to the facility is provided by means of an entrance onto the R162 and a site road of approximately 0.85 km in length.

The overall landownership boundary is approximately 13.2ha. The landownership area is shown on Figure 2. The site lands are situated at an elevation of between 60m and 88m AoD. To the east and west of the application site, the land rises gently from low hills reaching high points of 173m AoD at Carricleck to the east and 155m AoD at Boynagh to the west.

The existing hedgerows and an area of coniferous forestry that surrounds the existing facility provide screening.

1.3 NEED FOR ENVIRONMENTAL IMPACT STATEMENT (EIS)

The consequences of any major engineering project are required to be presented in the form of an Environmental Impact Statement (EIS). The EIS, as prepared, contains a description of the existing environment, information on the scale and nature of the proposed development, an impact assessment of the proposed development and mitigation measures to reduce the impact on the receiving environment. This document provides a non-technical summary of the overall EIS describing the existing environment, the proposed development and potential impacts and mitigation measures.



GENERAL LEGEND
 APPLICATION BOUNDARY (Blue line)
 ACTIVITY BOUNDARY (Red line)

SITE NOTICE LOCATION
 X

NOTES
 1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
 2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
 3. ENGINEER TO BE INFORMED BY THE CONTRACTOR OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES
 4. ALL LEVELS SHOWN RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

200m 0 200m 400m 600m

Rev	Date	Description	By	Chk'd
B	25.05.10	ISSUED FOR W/LA	MN	PON
A	30-05-09	ISSUED FOR E/S	MN	P.ON

Client: **Thorntons recycling**

Project: **KILMAINHAMWOOD FACILITY EXPANSION**

Title: **REGIONAL SITE LOCATION MAP**

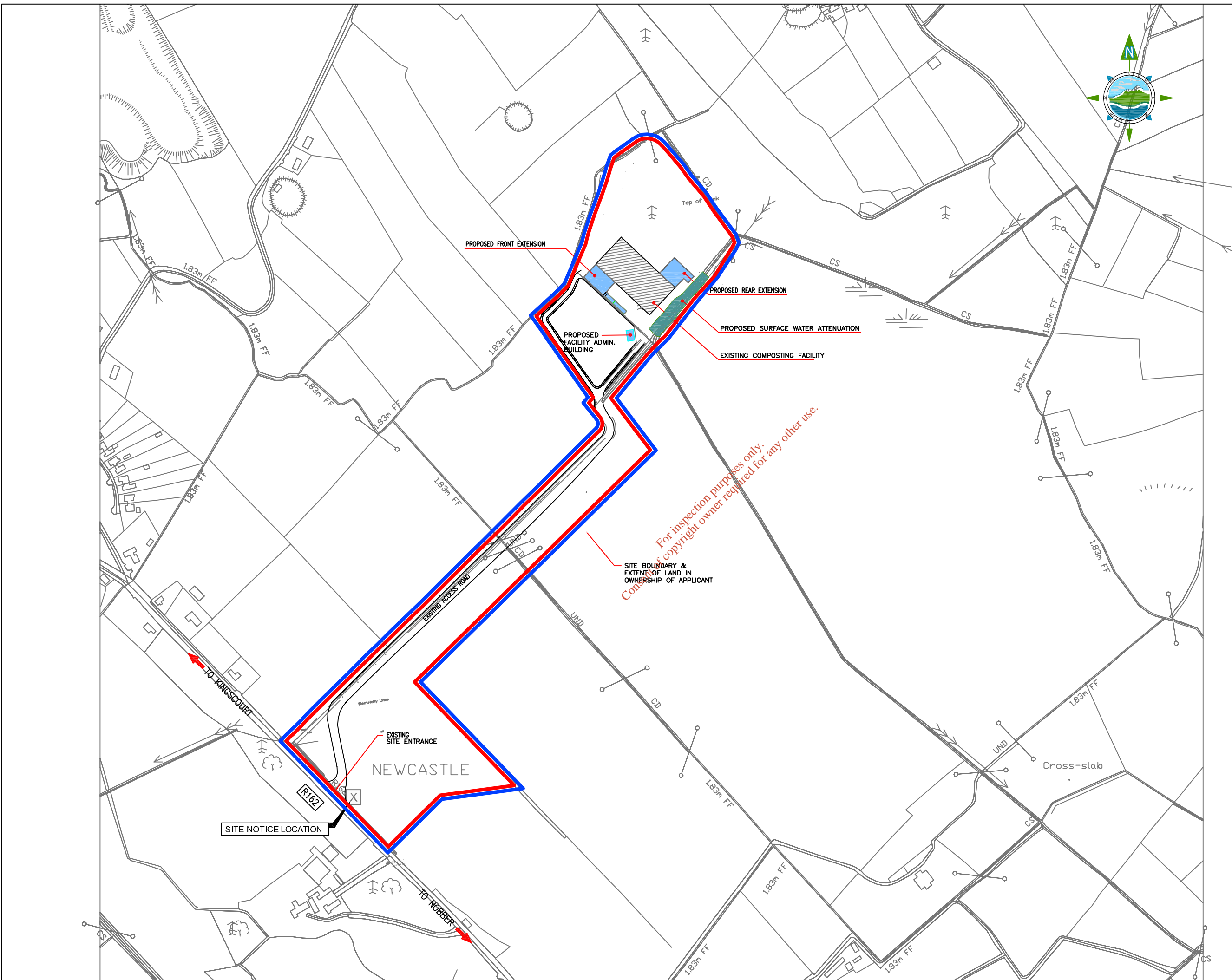
Scale @ A3: **1:20,000**

Prepared by: M. Nolan
 Checked: P. O'Neill
 Date: June 2009

Project Director: D. Grehan

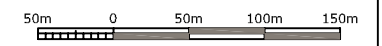
TOBIN
 Patrick J. Tobin & Co. Ltd.
 TOBIN Consulting Engineers,
 Block 10-4, Blanchardstown Corporate Park,
 Dublin 15, Ireland.
 tel: +353(0)1-8030406
 fax: +353(0)1-8030409
 e-mail: dublin@tobin.ie
 www.tobin.ie

Drawing No.: **Figure 1 B**



GENERAL LEGEND
 APPLICATION BOUNDARY — ACTIVITY BOUNDARY —
 SITE NOTICE LOCATION X

- NOTES:**
- FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING.
 - ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE.
 - ENGINEER/EMPLOYERS REPRESENTATIVE, AS APPROPRIATE, TO BE INFORMED BY THE CONTRACTOR OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES.
 - THE CONTRACTOR SHALL UNDERTAKE A THOROUGH CHECK FOR THE ACTUAL LOCATION OF ALL SERVICES/UTILITIES, ABOVE AND BELOW GROUND, BEFORE ANY WORK COMMENCES.
 - ALL LEVELS SHOWN RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD.



Rev	Date	Description	By	Chkd
B	25.05.10	ISSUED FOR WLA	MN	PNR
A	30-06-09	ISSUED FOR EIS	MN	PNR

Client: **Thorntons recycling**

Project: **KILMAINHAMWOOD FACILITY EXPANSION**

Title: **SITE LOCATION MAP**

Scale @ A3: **1:5000**
 Prepared by: **N.Vennard** Checked: **P.O'Neill** Date: **February 09**
 Project Director: **D.Grehan**
 Drawing Status:

TOBIN
 Patrick J. Tobin & Co. Ltd.
 TOBIN Consulting Engineers,
 Block 10-4, Blanchardstown Corporate Park,
 Dublin 15, Ireland.
 tel: +353-(0)1-8030406
 fax: +353-(0)1-8030409
 e-mail: dublin@tobin.ie
 www.tobin.ie

Drawing No: **Figure 2 B**

2 EXISTING SITE AND PROPOSED DEVELOPMENT

2.1 DESCRIPTION OF THE EXISTING SITE

The site at Ballynalurgan, Kilmainhamwood, Kells, Co. Meath is situated approximately 2.4 km northeast of the village of Kilmainhamwood, 6km northwest of the village of Nobber, Co. Meath, and 4km south of Kingscourt, Co. Cavan. The site, of approximately 13.2 hectares, is in the townlands of Ballynalurgan and Newcastle.

The site is made up of two fields. One field, of approximately 7.7 hectares, extends from the Kingscourt to Nobber road (R162) in the southwest to a second inner field, to the northeast of the site. The second inner field, of approximately 5.5 hectares, previously planted for commercial forestry, is now the location of the existing Kilmainhamwood Compost facility.

As part of the development of the existing facility, a 5m wide road of approximately 0.85km in length was constructed from the composting facility to the R162 regional road to facilitate the movement of delivery vehicles to the composting facility located in the inner field.

The gross floor area of the existing composting buildings (indoor area) is approximately 4550m². The existing facility buildings are a steel portal frame design featuring 3.0m high mass concrete walls and green cladding. The apex of the roof is 12.5m above ground level. The existing facility comprises of 22 No. positively aerated composting bays and 2 No. positively aerated Animal By-product (ABP) treatment tunnels. The existing facility also includes a waste reception area, a compost screening area and an odour abatement area. The gross footprint of the existing composting buildings and odour abatement area is approximately 5639m².

An ESB substation building is located adjacent to the composting facility buildings. The floor area of this building is approximately 34m².

Plate 1: Existing Kilmainhamwood Compost Facility



2.2 DESCRIPTION OF THE PROPOSED DEVELOPMENT

The facility is currently permitted, as per EPA waste licence W0195-01, to accept and process 20,800 tonnes of biodegradable waste per annum. The current facility has been operational since September 2006. Thorntons Recycling now propose to extend the existing facility to accept and process up to 40,000 tonnes of biodegradable waste per annum.

Proposed Extensions to Facility Buildings

The current application proposes to extend the existing facility buildings in order to provide sufficient processing capacity for the additional tonnage. It is proposed to construct a 38m x 25m front extension (approximately 1167m² – including 201m² ramp for waste acceptance) on the southwest side of the existing facility and a rear extension 39m x 30m (approximately 1043m²) on the northeast side of the existing facility.

The front extension will serve as a new waste reception area. It is proposed to construct a 2m high ramp, with a maximum slope of 1:10, on the southeast side of this extension to facilitate waste acceptance.

The rear extension will serve as an Animal By-product (ABP) treatment and storage area. This extension will also feature a roofed “drive through” section which will provide a covered area (controlled environment) for the loading of finished compost into vehicles for dispatch from the facility.

The extensions to the buildings will be a steel portal frame design featuring 3.0m high mass concrete walls and green cladding (to match character of the existing buildings). The height of the proposed extensions will not be any higher than the existing buildings.

The existing weighbridge currently located to the southwest of the existing facility buildings will be relocated to facilitate the footprint of the front extension on the southwest side of the existing facility.

Planted trees adjacent to the existing facility will be removed to facilitate the proposed extensions. A total area of approximately 3200m² of planted trees will be cleared. Following the construction of the proposed extension to the facility the gross floor area of the composting buildings (indoor area) will be approximately 6550m².

Proposed Facility Administration Building

Presently, office and employee welfare accommodation of a temporary nature is provided at the Kilmainhamwood Compost facility in the form of portacabins. As part of the current application, it is proposed to construct a facility administration building to include offices, tea station, locker room, toilets and shower area. This will be a single storey building with a pitched and tiled roof. External walls will be of block work construction with a plastered finish.

Proposed Upgrade to Odour Abatement System

The existing composting system involves material being composted in open bays whereby odourous air is displaced to the building headspace. Hence large odourous air volumes (101,000m³/hr) require

treatment, which is deemed inefficient in regard to power consumption. The odour abatement system currently in operation at the Kilmainhamwood Compost facility involves biofiltration.

Thorntons Recycling has commenced the upgrade of the odour abatement system on site in order to further reduce the odour emission rate from the facility. Each existing composting bay within the facility building has been enclosed/roofed (such that the distance from the floor of the composting bay to the underside of the roof is 6m), thus significantly reducing the volumes of process air that require treatment. Works on enclosing existing composting bays were completed on site in January 2010. The displacement of odourous air, from the composting process, to the headspace of the building is now prevented thereby implementing double containment features and allowing for the specific treatment of this odourous air. In addition Thorntons Recycling propose to process the odourous air generated within the enclosed composting bays in an acid scrubber to minimise ammonia carryover to the biofiltration system.

The existing facility is certified to International Standards for Environmental (ISO14001), Health and Safety (OHSAS 18001) and quality (ISO9001) and operates an Integrated Management System (IMS). In regard to the proposed scrubber unit, all safety and environmental aspects will be incorporated into the Integrated Management System.

Proposed Agricultural Grade Compost

It is proposed that the compost produced at the intensified and extended facility will be an agricultural grade compost. Refer to Section 2.5.5 herein for further details.

Proposed Ancillary Works

Other works required to integrate the proposed extensions to the facility buildings and the proposed facility administration building into the existing facility will include:

- Extension to surface water drainage network;
- Foul water drainage network from proposed facility administration building to the existing waste water treatment plant;

Surface water attenuation infrastructure is also proposed for the Kilmainhamwood Compost facility. The areas adjacent to the proposed extensions to the facility buildings and the proposed facility administration building will be landscaped.

2.3 SITE INFRASTRUCTURE

The existing site infrastructure includes a weighbridge, site security arrangements, site accommodation in the form of temporary portacabins, site road, wastewater treatment plant for site accommodation, surface water drainage, water storage tank for fire fighting measures, car parking, and other services (including telephone system, 400V three phase electricity from substation, and on site borehole for provision of water).

Planning has already been secured for all the permanent site infrastructure mentioned above as part of the original proposal. Construction of such infrastructure has been completed. This infrastructure will facilitate the proposed extension to the Kilmainhamwood Compost facility.

The existing waste water treatment plant and associated percolation area is more than adequate to serve the proposed facility administration building. The foul pipe network will be extended to facilitate this proposed building.

The existing borehole well (BH3) is located adjacent to the existing water storage tank on elevated ground. An onsite water treatment plant at the point of entry to the facility administration building to treat the well supply to drinking water standard will be developed. It is proposed to provide a package plant in the tea station, within the proposed facility administration building, providing chlorination and filtration.

Two networks of surface water pipes serve the existing facility, the first collecting roof water and the second collecting surface water run off from the yard. All surface water run off from the roofs of the existing facility buildings is collected and reused where possible within the composting process. Surplus surface water run off is piped to a drainage ditch located along the eastern boundary of the site and flows in a south-eastern direction prior to eventually discharging into the Dee River.

It is proposed that the additional surface water generated by the proposed facility extensions will be reused where possible within the composting process with any surplus surface water run off diverted to the drainage ditch located along the eastern boundary of the site.

A proprietary grit interception trap and a proprietary oil interceptor (Class 1) have been installed at the facility through which all intercepted run off from outdoor hardstanding areas is diverted. The outfall from the grit trap and oil interceptor is discharged to the drainage ditch located along the eastern boundary of the site. The existing grit trap and oil interceptor have sufficient spare capacity to treat additional storm water generated by the proposed facility extension.

Surface water attenuation infrastructure is proposed for the Kilmainhamwood Compost facility. A low lying forested area adjacent and south east of the existing facility building will be used to provide storage volume to cater for a 1 in 100 year storm event. The greenfield runoff rate to the existing drainage ditch will be controlled by a hydrobrake. An overflow, downstream of the oil interceptor, will discharge into the storage area. When the storage area fills, some water will infiltrate to ground and the remainder will discharge back to the existing drainage ditch over time.

2.4 SITE MANAGEMENT

The facility manager is responsible for the day to day operation of the facility in compliance with all legislative and regulatory requirements. The facility manager is part of the Thorntons Recycling management team.

The facility operates, as permitted, on a daily basis from 8.00am to 6.00pm Monday to Friday and 8.00am to 1.00pm on Saturdays. The hours of operation will be the same for the composting facility following the proposed extension. Waste that is accepted at the composting facility at or near closure of operating hours will be discharged in the waste reception area, stored overnight and handled during the next working day.

There are 4 No. personnel currently employed to operate the Kilmainhamwood Compost facility, to process 20,800 tonnes per annum in accordance with current permissions. The current staff is comprised of a facility manager, production supervisor and two general operatives. The proposed extension of the Kilmainhamwood Compost facility to process a maximum of 40,000 tonnes per annum of organic waste will require an additional two general operatives.

All staff employed by Kilmainhamwood Compost receives Environmental, Health and Safety, and in house composting process training. The existing facility is certified to International Standards for Environmental (ISO14001), Health and Safety (OHSAS 18001) and quality (ISO9001) and operates an Integrated Management System (IMS).

All waste traffic access the facility by turning from the R162 into the site entrance, and then travelling along the facility access road until the inner facility entrance is reached. Given the length of the access road (0.85km) from the R162, there is no possibility of traffic on the R162 being affected by vehicles queuing to enter the facility.

An adequate number of signs are positioned strategically around the facility to facilitate the efficient movement of waste delivery and compost removal vehicles. Car parking is provided for employees, delivery personnel and visitors at the facility.

2.5 FACILITY OPERATION

The existing composting process at the Kilmainhamwood Compost facility is capable of processing a range of biodegradable wastes. Presently, composting feedstock accepted at the facility include:

- Brown bin biowaste;
- Grease trap waste;
- Catering waste from hotels and restaurants;

Typical amendment materials accepted at the facility include sawdust and woodchip generated from other waste streams. In compliance with the current EPA Waste Licence, no hazardous waste is accepted at the facility.

The extended facility will be capable of processing increased quantities of biowaste (up to 40,000 tonnes per annum). The additional feedstock is expected to include biowaste derived from brown bin source separated household collections. This is driven by the continuous roll out of the brown bin in the North East Region and the resultant need for biological treatment capacity.

2.5.1 Waste Acceptance

All feedstock is delivered to the facility in covered/enclosed vehicles. All waste delivery vehicles are required to drive onto the facility weighbridge where the gross weight of the vehicle is recorded. The weighbridge operator records all details on a computerised software system called WIMS (Waste Information Management System).

Waste is only accepted from contractors who have a contract with Thorntons Recycling. This ensures that all contractors have been assessed in advance and waste characterisation profiling has been carried out.

2.5.2 Feedstock Blending

Moisture and carbon to nitrogen ratio are important factors in determining the correct composting conditions suitable for high rate aerobic composting. As a result the incoming feedstock, following shredding (if deemed necessary), is mixed with seed compost and other amendments including sawdust and woodchip. These supply a readily available carbon energy source to the microorganisms.

2.5.3 The Composting Process

Following the mixing and blending process, the feedstock is moved by loading shovel and placed in the composting bays for the initial phase of composting (typically a one week process) where the level of microbial activity and hence oxygen consumption are highest.

The composting process is a forced aeration temperature feedback system. The composting bays feature an automated forced aeration system. There is an aeration fan behind each composting bay to blow air up through the pile and control temperature. The system maintains a temperature ceiling of 60°C by means of the on-demand removal of heat by ventilation through temperature feedback control.

Throughout all stages of the composting process, temperature is monitored by use of temperature probes. This helps to ensure that the bays are being adequately aerated. Moisture is checked by means of a "squeeze" test which is a non-quantitative method of estimating moisture.

After the initial phase of high rate composting, the material is moved by loading shovel to composting bays in the maturation area of the facility where the compost is matured by aerating the compost for another 10-12 days.

Following this stage, the compost is processed through a trommel screen fitted with 12mm and 40mm screens. The minus 12mm fraction produced by the screening process is placed in a bulking tunnel which allows enough material to be bulked in order to fill the pasteurisation tunnel. This normally takes approximately 3 weeks. The material is then transferred in to an Animal By-product (ABP) treatment tunnel where the temperature of the material is maintained at 70°C for a minimum of 1 hour, in line with the requirements of the Department of Agriculture, Fisheries and Food (DAFF).

Samples of compost product are subsequently sent for laboratory testing (E. Coli and Salmonella) to a DAFF approved laboratory and left in situ until analysis results are returned from the laboratory. This process from when material enters the ABP tunnel and final results are received may take up to 3 weeks.

2.5.4 Odour Abatement System

The odour abatement system currently in operation at the Kilmainhamwood Compost facility involves biofiltration. The existing 2 No. biofilters at the Kilmainhamwood Compost facility comprise of a firm concrete floor and surrounding concrete walls. The floor has a fall towards a drained sump situated at one end of the chamber for water drainage. A false floor acts as the support for the biofilter media. The sump liquid is pumped back to the waste reception area within the composting building.

Plate 1 Existing Biofilters at Kilmainhamwood Compost Facility



2.5.5 Compost Product

Currently, the high quality compost produced at the Kilmainhamwood Compost facility is used as a soil conditioner in commercial agriculture, as material for landscaping, as organic fertiliser and as a custom growing media.

It is proposed that the additional compost generated by the proposed extension and intensification of the Kilmainhamwood facility will be used as a soil conditioner in commercial agriculture. The compost, produced by the facility, has the benefit of providing particular nutrients to nutrient deficient lands. For example, compost from the facility is currently spread on lands in County Louth where a deficiency in zinc has been identified. The compost, being a valuable source of nutrients, is applied to lands in conjunction with nutrient management plans.

Working in association with a local agronomist, the facility has developed a land-bank of local long term arable land that can accommodate all compost produced at the facility. This land-bank (approximately 1,500 hectares), within 50 kilometres of the facility, of long term arable land can accommodate all

compost produced at the existing facility and all additional compost that will be produced by the proposed extension and intensification of the facility. The land-banks are located in Dunsany in County Meath and Ardee in County Louth. Refer to Figure 2.1.

The agronomist liaises with landowners and, using maps and soil analysis, recommends the spread rate of compost per acre and outlines buffer zones where compost should not be spread. Additionally the agronomist monitors the crops at crop establishment and advises the farmer on nutrition in order to achieve optimum results.

To ensure a uniform spread rate of compost, the facility invested in a state of the art compost spreader which is used in conjunction with a 200 HP John Deere tractor.

Product development is never ending at the facility. Thorntons Recycling currently provide finished compost to landscape gardeners. The facility has also facilitated a 'take back scheme' for Dublin City council, where 10,000 bags of compost were made available at Dublin civic amenity centres to members of the public. A scheme was also undertaken at the civic amenity centre in Dunboyne, in County Meath, where the public could collect compost.

The production of bagged compost for sale is a further potential outlet for high quality product produced by the facility.

As part of the review of the current EPA waste licence (W0195-01) required for extension of the facility and intensification of waste acceptance, Thorntons Recycling propose the production of 'agricultural grade compost' specifically for use as a fertiliser and soil improver on agricultural land. It is proposed that this compost, while not meeting the high stability requirements specified in Schedule E of the current waste licence (W0195-01), will meet all other requirements specified in the current waste licence and its associated Technical Amendment A including trace elements and pathogens.

Agricultural grade compost can be produced following the initial and intensive phase of composting (typically a 4 week process) where easily degradable components of the feedstock, such as proteins, sugars, fats and starches, are broken down. Agricultural grade compost will also be processed to Animal By-Product (ABP) treatment standards as required by the Department of Agriculture, Fisheries and Food. The conversion of proteins, sugars, fats and starches by way of the composting process renders the resultant material unattractive to animals, birds and other wildlife, thereby avoiding related nuisances when spread on agricultural land.

Thorntons Recycling propose that the stability of agricultural grade compost produced at the Kilmainhamwood Compost Facility is less than or equal to 20 mmol O₂/kg organic solids/h (OUR – Oxygen Uptake Rate Method). In the EPA Strive Report on the "Development of an Industry-Led Quality Standard for Source-Separated Biodegradable Material Derived Compost" published in 2009, the OUR method (Veeken et al., 2003) of stability measurement is proposed as a very reliable and consistent method. Presently and in the past, farmyard manures and other organic materials (including

sludges from wastewater treatment plants) having a lower stability and a greater potential for odour nuisance than the 'agricultural grade compost' proposed by Thorntons Recycling are spread on agricultural lands.

In comparison to finished compost where all biodegradable components (including cellulose and lignin structures) have been broken down, agricultural grade compost has an improved readily availability of nutrients for plant uptake. Nutrients from finished compost are slowly realised to the plants, over more than one growing season, and hence artificial fertilisers are still required for the viable production of crops. It is widely accepted that the "immediate unavailability" of nutrients in finished compost is a significant barrier to widespread use of compost in place of artificial fertilisers in modern agriculture. The poor nutrient availability of compost compared to artificial fertilisers is highlighted in the following statement taken from a Report (Quality compost as part of a Winter Wheat Fertilizer Programme) produced by WRAP in 2008:

"Yields for compost only treatments increased in line with increased compost application but yields were significantly lower than the inorganic fertilizer treatments. Low yield on compost only treatments was due to poor nutrient availability, specifically for nitrogen, and hence poor plant uptake and crop development"

The production of compost which is not fully stabilised, and therefore with a greater immediate availability of nutrients, for agricultural applications is an environmentally acceptable method in other European countries (such as Germany). In such countries, compost, produced to a Rottegrad III standard (based on self heating test), is spread on agricultural land as a fertiliser and soil improver. Proven practices in Germany are confirmed by the following statement taken from the EPA Strive Report previously mentioned.

"For example, in Germany, compost used on agricultural land is called 'fresh compost' which is half-matured compost with a relatively high biological activity but still would have reached a high temperature phase to kill pathogens (Timmermann et al., 2003; Anonymous, 2008b)."

On the basis of comparisons available in international papers on the topic of compost stability, the stability of Rottegrad III compost (produced and applied to agricultural land in Germany) is comparable to compost produced to a stability of 20 mmol O₂/kg organic solids/h (OUR).

The production of an agricultural grade compost with readily available nutrients for plant uptake will create and open significant markets for compost produced in Ireland, thereby stimulating the composting industry and ultimately diverting biodegradable municipal waste from landfill. These markets would be sustainable in the long term in comparison to the application of compost (derived from source separated waste) as daily cover in landfills, a market likely to diminish as the role played by landfill in Irish waste management decays.

It is widely accepted that for agricultural applications, the presence of heavy metals and the level of contamination (particularly in the form of glass or plastic) in compost is a more critical factor than overall

stability. Indeed, the production of finished compost (very stable) does not reduce the levels of heavy metals and/or contamination in compost. Indeed the levels of contaminants and heavy metals are concentrated due to the reduced overall mass of fully stabilised compost.

Any compost produced at the Kilmainhamwood Compost facility for other uses such as horticulture and landscaping would be stabilised to the proposed industry compost quality standard for Ireland as detailed in the EPA Strive Report (13 mmol O₂/kg organic solids/h (OUR)).

Thorntons Recycling propose that the revision of the facility waste licence by the EPA would include two individual maturity requirements, one maturity standard for 'agricultural grade compost' (20 mmol O₂/kg organic solids/h (OUR)) and a second maturity requirement (13 mmol O₂/kg organic solids/h (OUR)) for all other compost produced at the facility.

Kilmainhamwood Compost is currently licensed to accept other biodegradable materials, such as organic fines (from mechanical treatment of municipal waste), to produce a stabilised biowaste. To date no stabilised biowaste has been produced at the facility as all feedstock is from source segregated wastes. Notwithstanding the above, the Kilmainhamwood Compost facility will continue to be licensed to produce stabilised biowaste.

2.6 NUISANCE CONTROLS

The waste management facility is operated in compliance with EPA waste license (W0195-01). The facility is certified to international standards for Environmental (ISO14001), Health and Safety (OHSAS 18001) and quality (ISO9001) and operates an Integrated Management System (IMS).

Operations at the composting facility are carried out in a planned and controlled manner, thereby minimising potential nuisances such as odours, dust, noise, litter, vermin, etc.

The conditions of the licence include measures to minimise or prevent nuisance to the public occurring as a result of the operation of the facility. A complaints register detailing any complaint received from the general public in respect of the operation of the facility is maintained at the site.

2.7 ENVIRONMENTAL MONITORING

All environmental monitoring is carried out under the conditions of the waste licence (W0195-01) for the facility, issued by the EPA. The extended facility will be operated in compliance with a revised waste licence, following a waste licence review by the EPA. Emission Limit Values (ELV) has been set by the EPA for many of the parameters to be monitored. Exceeding these values is treated as an incident and the EPA are notified accordingly.

The primary aims of these monitoring programmes are to comply with legislation, the requirements of the EPA, to monitor the quality of the environment in the vicinity of the site and identify any adverse impacts from the operation of the facility.

As part of the Waste Licence an Annual Environmental Report (AER) is formulated that collates and reports all monitoring data each year. A comparative assessment is made with data from previous years. This report is submitted to the EPA before the March 31st each year.

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3 ALTERNATIVES

Schedule 6 of the Planning and Development Regulation (2001) specify that the EIS should include *'An outline of the main alternatives studied by the developer and an indication of the main reasons for his or her choice, taking account the effects on the environment'*.

The EPA publication, Guidelines on the information to be contained in Environmental Impact Statements, states *'The consideration of alternatives also needs to be set within the parameters of the availability of land (it may be the only suitable land available to the developer) or the need for the project to accommodate demands or opportunities which are site specific. Such considerations should be on the basis of alternatives within the site, e.g. design, layout'*.

An outdoor composting system does not allow for the provision of process and emission control measures which could lead to odour nuisances at or near the facility. The composting process is dependent on the prevailing weather conditions leading to extended composting time requirements. In addition the final quality of the product cannot be guaranteed consistently using an outdoor system and Animal By-Product requirements cannot be satisfied. An indoor composting facility will therefore be required.

Overall a tunnel or bay composting system is recommended for the extension to the Kilmainhamwood Compost facility due to the modularity of the system, its inherent flexibility, the limited need for mechanical plant, its robustness and low maintenance requirements. On the basis of the proven track record of the existing indoor bay composting system (which has operated successfully since September 2006) to produce a high quality compost product in a controlled environment with minimal impact on the environment, it is recommended that additional composting bays are constructed to facilitate the extension to the facility.

In order to optimise the volumes of process air that require treatment, it is recommended that both the existing and additional compost bays are enclosed by way of a concrete roof and canopy door, thus significantly reducing the volumes of process air that will require treatment. Only the volume of air between the composting mass and the roof of each composting bay will require intensive odour treatment as opposed to the entire volume of the facility building.

Chemical scrubbing followed by biofiltration has been proven at numerous composting facilities for the effective treatment of sulphur based odour compounds (such as hydrogen sulphide, organic sulphides and mercaptans) and nitrogen-based compounds (such as ammonia and amines) at acceptable and justifiable operating costs.

The current application comprises of an extension to the existing facility. Hence due to the acceptance of the current facility location in the last planning decision, economies of scale and operational reasons, alternative site locations have not been contemplated. It is considered that extending an already

existing facility is a more sustainable approach than the development of a new facility on a green field site.

The do-nothing scenario would represent a missed opportunity to make a contribution towards Ireland meeting its obligations under the EU Landfill Directive to divert biodegradable waste from landfill.

In a do nothing alternative, the absence of composting facilities will not contribute to local, national and European policy. Organic wastes would otherwise be disposed of by landfilling or thermal treatment both of which are the least preferred option for the treatment of biodegradable municipal waste and hence contrary to government policy.

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4 POLICY, PLANNING AND DEVELOPMENT CONTEXT

The composting facility is currently owned and operated by Padraic Thornton Waste Disposal Ltd, trading as Thorntons Recycling. The construction of the facility commenced in October in 2005 and the facility was operational in September 2006.

The facility at Kilmainhamwood and its proposed extension is in line with waste management policy in terms of diversion of waste from landfill and the development of biological treatment facilities.

The Waste Management (Food Waste) Regulations 2009 are designed to promote the segregation and recovery of food waste arising in the commercial sector. They will facilitate, in particular, the achievement of the targets set out in Directive 99/31/EC on the landfill of waste for the diversion of biodegradable municipal waste from landfill sites to composting and biogas plants and to other forms of waste recovery. The proposed extension of the Kilmainhamwood facility will provide additional capacity for the composting of additional biodegradable waste that will arise when the Food Waste Regulations are fully implemented.

The National Strategy on Biodegradable Waste (2006) outlines Government policy for the diversion of biodegradable municipal waste (BMW) from landfill. This sets ambitious targets for operational capacity to treat source separated food and garden waste by composting and anaerobic digestion for the following years;

- By 2010 - 250,000 tonnes minimum
- By 2013 - 320,000 tonnes minimum
- By 2016 - 330,000 tonnes minimum

The report states that a significant increase in biological treatment capacity is required to meet the targets set out by the Landfill Directive. This strategy is designed to secure the diversion of biodegradable municipal waste from landfill, the key benefit is to reduce the methane emissions from landfills and to encourage the separate collection of biodegradable waste. The proposed development is a component in achieving government policy and in fulfilling the requirements under the landfill directive.

The design of the proposed extension to the Kilmainhamwood Compost facility is in line with the latest requirements of the Department of Agriculture, Fisheries and Food. These requirements favour a “one way system of material flow” of waste to prevent cross contamination.

The proposed development is in line with requirements of the North East Waste Management Plan 2005-2010 and is needed in order to meet our requirements under the Landfill Directive and to meet the recycling targets set in the Plan. The proposed development will comply with the policy for siting Biological Treatment Facilities set out in this Plan.

The proposed development is in line with the policies of Meath County Council. The proposed extension of the existing composting facility will not negatively impact on the character and amenity of the surrounding area. The existing facility and its proposed extension will continue to operate in line with current policies, and regulations.

The proposed extension and intensification of the Kilmainhamwood Compost facility is regarded as infrastructure that is required to provide urgently needed biological treatment capacity for the North East and Dublin Regions.

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5 HUMAN BEINGS/SOCIO ECONOMIC

5.1 INTRODUCTION AND EXISTING ENVIRONMENT

A desk study was carried out in order to examine all relevant information pertaining to planning and socio economic activity in the study area. The relevant national, regional and local planning guidelines were examined along with the Meath County Development Plan 2007-2013.

Fáilte Ireland tourist literature for Meath was examined in relation to tourism amenity in conjunction with websites of relevant tourism sites and amenities for the area. In addition Ordnance Survey maps were used to identify land use and possible amenity and tourist sites that may be located in proximity to the existing composting facility.

The site is located in a rural agricultural area approximately 4km south of Kingscourt, Co. Cavan in the townlands of Ballnalurgan and Newcastle. The site lands are currently used as a composting facility and related infrastructure. The area immediately surrounding the site is predominantly farmland with residential dwellings and farm buildings located in the vicinity of the composting facility. A number of industries are located in proximity to the site. These include Gypsum Industries and College Proteins. The nearest occupied dwelling is located approximately 400m north of the existing facility and its proposed extension.

Rathe house equestrian centre outside Kilmainhamwood has been identified as a tourist facility. This is located approximately 2km to the south of the existing facility. There are no designated walking routes located in proximity to the existing composting facility.

5.2 SIGNIFICANT IMPACTS AND MITIGATION MEASURES

The composting facility is not located in close proximity to any urban areas. The proposed extension of the facility will not negatively impact on any towns or villages. There are a number of dispersed dwellings in close proximity to the site. The composting facility will therefore operate under rigid guidelines to assure residential amenity is maintained.

The proposed extension to the existing composting facility will lead to the generation of 2 no. additional jobs. Employment will also be generated during the construction phase of the development. Spin off employment will also be provided and retained by this development.

The continued operation and the proposed extension of the existing facility will have a positive impact in relation to the socio-economic standing of the surrounding area. This will take the form of retaining and providing direct and indirect jobs. All activities on site will be carried out with regard to strict environmental and safety guidelines. When all mitigation measures are complied with there should be no significant impacts arising from the facility's continued use and proposed extension. It is anticipated that the development will not have a negative impact on the everyday activities and lifestyles of local people and the surrounding environs.

6 FLORA & FAUNA

6.1 EXISTING ENVIRONMENT

The National Parks and Wildlife Services database of designated nature conservation areas was searched for designated sites within 5km of the site. The development site does not lie within or adjacent to any area that has been designated for nature conservation under Irish or European legislation. The nearest designated site is Ballyhoe Lough pNHA located 5.3km to the northeast.

Two habitats are present within the proposed facility activity area. Buildings and artificial surfaces habitat are of low ecological value as it is disturbed with little or no associated vegetation. Mixed broadleaved / conifer woodland which is of low - moderate ecological value as it a young plantation with low species diversity but locally important for wildlife.

No rare or protected species of plant or animal were recorded on site. The woodland on site provides potential foraging habitat for bats. However, conditions within the facility activity area are unsuitable for bat roosts. Boundary treelines may provide temporary roost sites and will be retained. All bats and their roosts are protected under the Irish Wildlife Acts.

6.2 POTENTIAL IMPACTS

A small section of the mixed broadleaved/conifer woodland habitat will be permanently removed for the extensions at the immediate northeast and southwest of the existing facility area. There will be no direct impact to adjacent habitats outside the proposed site activity boundary. Mitigation measures have been proposed to prevent any indirect impacts as a result of the proposed development.

This proposed development will not impact on any rare or protected flora.

Removal of a small area of the mixed broadleaved/conifer woodland habitat will lead to a loss of foraging and potentially nesting habitat for birds. However adjacent woodland and treelines will continue to provide good habitat for birds and local populations will be unaffected by the proposed development. The direct impact on nesting birds is expected to be minor providing mitigation measures are implemented.

No protected species of mammals were recorded on site. The main impact on the mammalian fauna is likely to be a minor loss of forage habitat for bats, however, the nearby woodland and treelines will continue to provide good habitat for these animals and local populations will be unaffected by the proposed development.

6.3 MITIGATION MEASURES

Several mitigation measures have been recommended including:

- If construction works are to take place within the bird nesting season (1st March - 31st August), the area of mixed broadleaved/conifer woodland (WD2) habitat to be removed should be surveyed for nesting birds prior to works by an experienced bird surveyor. If nesting birds are present then a licence must be obtained from the National Parks and Wildlife Service. If works are to take place outside the bird nesting season then no such licence will be required.
- No materials or machinery should be stored within 5m of remaining mixed broadleaved/conifer woodland and adjacent treeline and drainage ditch habitat close to the proposed facility activity area. Materials, especially soil and stones, can prevent air and water circulating to the roots of trees/shrubs. Damage to root systems can kill trees and no roots arising from the adjacent woodland to be retained should be damaged during site clearance and groundworks.
- To minimise impacts on foraging bats; it is recommended that outdoor lighting be cowled to ensure that light does not spill out onto adjoining habitats and focuses on the works area only. Cowled lights will ensure that lighting is directed onto the proposed development site only. The height of poles should also be restricted to reduce the possibility of light pollution onto adjoining habitats.
- Biological monitoring of water quality should continue as currently exists under current EPA licensing. This will allow appropriate actions to maintain existing water quality.

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7 SOILS/GEOLOGY & HYDROGEOLOGY

7.1 INTRODUCTION

A desk study and site visits were carried out to address the soil and geology aspects of the environment and assess the impacts of the extension on the existing soil, subsoil and bedrock environments. Existing data, including site specific site investigation reports, was consulted in the preparation of the Geology Section.

7.2 EXISTING ENVIRONMENT

The subsoils underlying the southern part of the site at Ballynalurgan, consist of gravels that have been derived from Lower Palaeozoic rocks.

Reference to the relevant geological information for this area, the 1:100,000 scale Sheet 13 – Bedrock Geological Map of Meath (GSI 1999) indicate that this is quite a varied area of bedrock geology and one of the few areas of Permo-Triassic rocks within Ireland.

The Kingscourt Sandstone Formation (KS) consists of a lower siltstone unit which grades upwards to a thickly bedded, cross laminated red sandstone. This formation conformably overlies the Kingscourt Gypsum Formation (KG).

According to the GSI, there are no karst features within 5km of the proposed activity area.

7.3 SIGNIFICANT IMPACTS

As the proposed changes to the facility do not involve any significant changes to the physical environment at the Thorntons Recycling composting site, there will be minimal impact on the geology of the underlying site.

The extension and proposed facility administration building area are currently comprised of made-ground, with the exception of an area of approximately 0.3ha of planted woodland and landscaping surrounding the perimeter. Potential risks posed to the natural geological environment at the site include the storage of chemicals and fuels and the maintenance of vehicles, mobile and fixed plant equipment.

If unmanaged, leachate from the incoming waste and the composting activities could infiltrate to ground and contaminate the underlying bedrock aquifer.

The increase in waste to be stored and composted at the facility will not impact on the surrounding environment as this material will be processed as per current operational procedures in the existing and proposed extension buildings.

7.4 MITIGATION MEASURES

All potentially polluting run-off from the composting process will be contained within the composting facility. A diesel tank is located on site. This tank is a double skin bowser with a capacity for 2,500 litres. To minimise any impact on the underlying subsurface strata and the groundwater from material spillages all waste oils, used spill kits, etc. used during operations will continue to be stored on a bunded pallet.

Spill kits will be retained on site to ensure that all spillages or leakages are dealt with immediately & staff trained in their proper use. Any servicing of vehicles on site will be confined to designated and suitably protected areas. The sites management system for quality, health and safety and environmental is certified to international ISO Standards.

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8 WATER

8.1 INTRODUCTION

A desk study was carried out to address the water aspects of the environment and assess the impacts of the facility extension on the existing hydrological and hydrogeological environments.

8.2 EXISTING ENVIRONMENT

The site is located in the upper catchment of the Dee River catchments, within the Neagh-Bann River District. The River Dee is located approximately 1km south of the Kilmainhamwood Facility. A surface water drainage ditch is located along the eastern boundary to the site and flows in a southeastern direction. Surface water and groundwater samples have been undertaken at the Kilmainhamwood Facility as part of the requirements of the existing EPA Waste License W0195-01.

Water Supply

Water for the facility is provided by a combination of a pumped borehole (BH3) and a rainwater storage tank. The water usage at the site is considered low. Kilmainhamwood Compost Facility is not connected to the local water mains supply. Water usage at the composting facility is only required for the washing of trailers, equipment and floors.

Water for washing will be utilised from the rainwater storage tank, the composting process will not place any demand on the onsite borehole. No water is used in the composting process as the incoming material contains excess moisture.

An onsite water treatment plant is proposed at the point of entry to the facility administration building to treat the borehole (BH3) supply to drinking water standards. It is proposed to provide a package plant in the Tea Station.

8.2.1 Potential Impacts of the Development

Construction Phase

The development of the site will change the setting of the site, by increasing the hardstanding area and roof area at the Kilmainhamwood Compost facility. During the construction period, a potential exists for discharge of sediment laden water from the site. This sediment laden water will be generated due to exposure of soil surfaces.

Operational Phase

The construction of the hardstanding will alter the natural hydrological setting of the site, whereby hardstanding surface run-off will be increased (from 5,918m² to 6,073 m²) and natural run-off flowpaths disrupted by the construction. The generation of increased runoff, as a result of increased hardstanding area, is a direct and long-term impact of the development. Without mitigation measures the magnitude of this impact is considered low to moderate. Appropriate mitigation measures, including surface water

attenuation, are proposed to ensure that discharges from the site are managed and regulated, so as to reduce the magnitude of the potential impact.

Surface water run-off from hardstand areas has the potential to absorb potential contaminants from surfaces, i.e. spillages or leakages from vehicles, machinery, etc. The run-off could also be heavily sediment laden. Discharge of such run-off to the receiving watercourse has the potential to adversely impact water quality. This is a direct potential impact of the development, however the potential magnitude is considered moderate. Appropriate mitigation measures are proposed to ensure that surface water is protected against accidental discharges to the drainage network. An existing silt trap and oil interceptor will be utilised as part of the proposed extension. Part of the proposed extension will be constructed on an existing concrete plinth, hence minimises the potential for additional run-off.

All suspended solids and hydrocarbon concentrations recorded to date, as per the surface water monitoring regime stipulated in the existing facility waste licence, comply with the relevant Regulations.

The proposed volume of discharge from the proposed surface water system to the existing drainage ditch will be restricted. This will be achieved by the provision of surface water attenuation infrastructure on site. It should be noted that the provision of surface water attenuation for the entire facility (surface water from the existing facility is currently not attenuated) will reduce and control the discharge rate to the drainage ditch during storm events.

The operational facility at present does not discharge any effluent from the site. There are no plans to discharge any effluent within the proposed extension. Process water is reused within the facility to provide optimum moisture content for the composting process.

Flooding

The proposed development site is not located in an area naturally prone to flooding. It is not envisaged that the proposed development will have any adverse impact on the flows of the Dee River as most of the effective rainfall is surface water runoff both pre and post development and that groundwater is primarily expected to discharge to the Dee river. Following construction of the proposed extension the risk of flooding within the development is considered low.

Groundwater

Given the presence of low permeability, deep subsoil (>10m), the presence of hardstanding throughout the site and the bunded facility building, the potential connection between the facility and the groundwater body is negligible. If there is a negligible connection between the facility and the groundwater body, the potential impact on the groundwater is therefore negligible. This applies to both existing and potential impacts.

In summary the potential impact on the surface water and groundwater environment is assessed as low.

8.2.2 Remedial or Mitigation Measures

Construction Phase

All site works will be conducted in an environmentally responsible manner so as to minimise any adverse impacts on the soils and water that may occur as a result of works associated with the construction phase.

With regard to on-site storage facilities and activities, any raw materials, fuels and chemicals, will be stored within structurally sound warehousing buildings and/or bunded areas if appropriate to guard against potential accidental spills or leakages. All equipment and machinery will have regular checking for leakages and quality of performance.

Appropriate measures are required during the construction period to ensure that all potential run-off is diverted through appropriate settlement tanks/grit traps.

Operational Phase

The design of the proposed development has taken into account the potential impacts associated with the construction and operation of the development on the water environment.

Surface Water

All incoming waste is and will be stored within the facility building. All composting operations take place and will continue to take place within the facility building. The finished product is and will be transported directly from the facility building off site. No compost is stored outside of the facility building. The facility building is fully bunded and therefore all waters from washing activities are contained and incorporated back into the composting process.

A small increase in hardstanding runoff (2.5%) is a consequence of the proposed extension to the facility. The proposed extension is designed to minimise hardstanding areas that generate surface water run off. Mitigation measures include the recycling, where possible, of surface water run-off from the site at the proposed development. The layout of the site has been designed for collection of surface water from roadways, paths and roofs within the development. Surface water runoff from roofs etc. will be reused where possible within the facility. Surface water runoff from the facility to the drainage ditch will be limited to 1 year return greenfield rates. In terms of surface water run off, in order to prevent potential contamination of soil/surface water/ groundwater media with water that may be contaminated with oil/ solids, an existing grit trap and oil interceptor will process surface water from hardstanding areas prior to discharge to the proposed surface water attenuation area or the drainage ditch. The existing grit trap and oil interceptor shall be utilised for the proposed extension of the facility.

Groundwater

The groundwater potential and quality beneath the site was proven by exploratory drilling. There are no predicted impacts on the groundwater as a result of the proposed development. Groundwater levels and groundwater quality is currently and will be monitored as part of the EPA waste license.

8.2.3 *Monitoring*

During the works undertaken for the construction of the facility extension, strict monitoring of all potential polluting materials used will be maintained. The surface water attenuation infrastructure, outflow control devices, grit trap and oil interceptor will require periodic maintenance. These systems will be monitored in accordance with the latest EPA waste licence requirements.

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9 AIR QUALITY AND CLIMATE

9.1 DUST

As part of scheduled monitoring required by the facility waste licence, dust monitoring is carried out at 3 No. locations. These locations were chosen to represent all directions of the site. Total dust deposition was measured using the Bergerhoff gauges specified in the German Engineering Institute VDI 2119 document entitled "Measurement of Dustfall using the Bergerhoff Instrument (Standard Method)." All dust-monitoring locations are below the compliance threshold limit of 350mg/m²/day (EPA Waste Licence W0195-01), when measured using the TA Luft Bergerhoff Method during this monitoring period.

There is the potential for dust emissions during the construction of the proposed extensions. Wind blown dust emissions may arise during the construction phase of the proposed development, which may impact upon the surrounding environment. The deposition of dust and mud on the local roads is both unsightly and dangerous. Dust may be a particular problem during periods of dry windy weather. However since the construction involves minimal earthworks and the construction period is not lengthy, there will not be a significant impact from dust emissions once mitigation measures are applied.

Previous dust monitoring on site clearly illustrates that dust is currently not a nuisance issue on site. All current waste processing takes place indoors within enclosed buildings which are maintained under negative pressure thereby reducing dust emissions arising at the facility. Similarly, all future waste processing will take place indoors within enclosed buildings, therefore dust emissions from the facility are not expected to be a nuisance issue for the proposed development.

Thorntons Recycling will endeavour to ensure that dust emissions are kept to a minimum at all locations and shall take all reasonable steps to minimise dust emissions. Currently a road sweeper is available, when required, to further reduce dust emissions from the yard and site road.

In summary the following mitigation measures are proposed:

- All composting and materials handling activities will continue to be carried out indoors;
- A road sweeper will continue to be used on site when required;
- Access routes will be regularly inspected and cleaned when necessary;
- The site road and all hardstanding areas will be sprayed with water in periods of dry weather to help suppress dust emissions;

It is anticipated that with the implementation of the above mitigation measures, dust emissions will continue to be in compliance at all dust monitoring locations when measured using the TA Luft/VDI 2119/Bergerhoff Method.

9.2 ODOUR

Odour Monitoring Ireland were commissioned to carry out an odour impact assessment of the composting facility located in Kilmainhamwood, Nobber, Co. Meath. The odour impact assessment was performed using measured odour emission data from the operating facility and dispersion modelling techniques utilising AERMOD Prime. The purpose of this assessment was to ascertain the level of performance of control of the existing odour control system on reducing odour emissions at the nearest sensitive receptor in the vicinity of the facility. The dispersion modelling assessment was also used to establish emission limit values for odour threshold concentration from the exhaust of the odour control system for the proposed upgrade to the facility in order to facilitate the acceptance of increased tonnage of material for processing. This will ensure that the new proposed facility will be able to accept increased tonnage while achieving no odour impact in the vicinity of the facility.

AERMOD Prime (07026) was used to construct the basis of the odour impact assessment in accordance with the standard international methodology. Five consecutive years of meteorological data (Clones airport 2002 to 2006 inclusive) was used within the dispersion model. Fifty metre Cartesian spaced grid receptors were used within the dispersion model examination in conjunction with topographical data processed from Ordnance Survey Ireland. The dispersion model was used in conjunction with existing and proposed source characteristics and odour emission rates in order to ascertain the extent of impact from the existing and proposed operations. In addition, the dispersion model was used to ascertain the maximum allowable level of odour emissions from the biofiltration systems. This allows for the establishment of a maximum allowable odour threshold concentration on an ongoing basis.

Each aspect of the odour control equipment and management procedures were examined and used to construct the basis of an odour management plan for the site. Specific key stress points in the overall odour control system were identified and included into the overall process verification procedure to ensure the operation of effective containment and end of pipe treatment. The overall structure of an odour management plan was developed for the facility operations to allow for efficient management and control of the odour management system.

The overall design of the odour control and management system for the composting facility considered containment, minimisation and treatment of odours generated within the facility. All composting operations including treatment are carried out indoors. The composting building is internally sealed with an expanded foam membrane to provide near 100% odour containment within the facility building. Normal roller doors are fitted to the access doors of the composting building. All odourous air generated within the existing building is collected using roof level extraction ductwork. The odourous air is directed under forced ventilation to two biofiltration systems containing a combination of woodchip and carbon media mix. The total air exchange capacity within the building is approximately 2.24 AC/hr. The measured total empty bed retention time for the biofiltration systems is 80 seconds on Biofiltration system 1 and 49 seconds on Biofiltration system 2.

The overall design of the existing composting facility containment system is effective in terms of odour containment and incorporates proven design elements. The existing composting system involves material being composted in open bays whereby odourous air is displaced to the building headspace. Hence large odourous air volumes ($101,000\text{m}^3/\text{hr}$) require treatment, which is deemed inefficient in regard to power consumption. In terms of the proposed upgrade, Thorntons Recycling has already enclosed each of the individual composting bays in order to allow for the capture and treatment of reduced volumes ($80,000\text{m}^3/\text{hr}$) of odourous air. In addition the odourous air generated by the enclosed composting bays will be treated within an acid scrubber to minimise ammonia carryover to the biofiltration system. Displacement of odourous air, from the composting process, to the headspace of the building is now prevented thereby implementing double containment features and allowing for the specific treatment of this air in an acid scrubber. The building headspace air is longer contaminated with high concentrations of ammonia thereby negating the need to treat this air within an acid scrubber. This approach ensures the efficient capture and focused treatment of odours generated by the composting process itself ensuring that the maximum allowable odour threshold concentration in the exhaust air of the biofiltration system is achieved.

Following completion of the odour impact assessment on the existing facility design and the proposed upgrade facility design (existing facility and proposed extension including upgrading of odour abatement system), the following key conclusions were developed. These included:

1. The odour assessment report provides the structure and methodologies for the development of an overall odour management, minimisation and mitigation procedure for the relevant operating entities at the operating composting facility.
2. The overall existing building structure at the facility is effective in terms of containment since the inner building fabric has been coated with a layer of expanded foam. This minimises potential leakage from the facility building when the wind is blowing on the building.
3. Following an odour audit of the existing facility, the measured odour threshold concentration on biofiltration system 1 ranged from $1218\text{ Ou}_E/\text{m}^3$ to $1,878\text{ Ou}_E/\text{m}^3$ with an average odour threshold concentration of $1,514\text{ Ou}_E/\text{m}^3$. The measured odour threshold concentration on biofiltration system 2 ranged from $1579\text{ Ou}_E/\text{m}^3$ to $2,233\text{ Ou}_E/\text{m}^3$ with an average odour threshold concentration of $1,953\text{ Ou}_E/\text{m}^3$. The odour threshold concentration from biofiltration system 2 was approximately 29% higher than biofiltration system 1. The average odour emission rate from biofiltration system 1 and 2 was $15,981\text{ Ou}_E/\text{s}$ and $34,178\text{ Ou}_E/\text{s}$, respectively. This equated to a total maximum odour emission rate of $50,159\text{ Ou}_E/\text{s}$ for a total volumetric airflow treatment capacity of $101,000\text{ m}^3/\text{hr}$. Due to the larger volume of air passing through biofiltration system 2, the odour emission rate from this system was on average 2.14 times higher than biofiltration system 1.
4. The dispersion modelling exercise was performed utilising AERMOD Prime dispersion model and the gathered olfactometry data and source characteristics on each biofiltration system for the existing facility design. The overall odour emission rate from the biofiltration system on the day of monitoring will lead to an odour plume spread from 500 to 800 metres from the facility boundary. Greater odour plume spread is experienced in the north east/south west directions due to the fact that low dispersion estimates are associated with meteorological conditions with

this wind direction and due to the fact that the local topographical features result in the receptors been at a higher elevation.

5. In terms of the proposed upgrade, improvements in double containment and scrubbing of the composting air itself will lead to increased odour removal efficiencies on each biofiltration system. The efficient capture and zoned treatment of the odourous air will ensure sustained performance of the odour control system. Improvements in the biofiltration system design will ensure efficient air distribution within each biofilter bed. The implementation of acid scrubbing on the composting air itself will minimise the carryover of ammonia to the biofiltration bed and thereby minimise acidification of the media.
6. From the proposed upgrade facility design, a maximum allowable odour threshold concentration of $800 \text{ Ou}_E/\text{m}^3$ was determined for biofiltration system 1 and 2. This equates to a total maximum odour emission rate of $17,778 \text{ Ou}_E/\text{s}$ for a total volumetric airflow treatment capacity of $80,000 \text{ m}^3/\text{hr}$. When compared to the existing odour emission rate this is approximately 64% lower and is significantly lower than existing conditions. Following dispersion modelling utilising AERMOD Prime, no odour impact will be perceived by residential receptors in the vicinity of the facility. All residential locations will perceive an odour concentration less than $1.10 \text{ Ou}_E/\text{m}^3$ at the 98th percentile of hourly averages for 5 years of hourly sequential meteorological data. In addition, all residential locations will perceive an odour concentration less than $2.60 \text{ Ou}_E/\text{m}^3$ for the 99.5th percentile of hourly averages for 5 years of hourly sequential meteorological data. This is approximately 13% and 27% lower than the accepted odour impact criterion for such facilities.
7. This overall odour assessment report provides a strategy and design notes for the optimisation of odour minimisation, mitigation and control of odour emissions from the composting facility and provides the backbone development of an odour management and preventative maintenance plan for the processes. The guaranteed emission rates of odours will provide compliance with the odour impact criterion.

The following recommendations were developed during the study and will be implemented at the Kilmainhamwood Compost facility for the proposed facility extension and upgrade of the odour abatement system:

1. Odour management, minimisation and mitigation procedures as discussed will be implemented at the composting facility in order to prevent any odour impact in the surrounding vicinity.
2. The maximum allowable odour emission rate from the overall composting facility biofilters will not be greater than $17,776 \text{ Ou}_E \text{ s}^{-1}$.
3. Good housekeeping practices (i.e. keep yard area clean, etc.) including closed-door management strategy (i.e. to eliminate puff odour emissions) will be maintained at current high levels. All odourous processes will be carried out indoors within the proposed facility as currently occurs.
4. The odour management plan will include a process description, management strategies for the prevention of emissions and a strict maintenance and management program for ensuring all odour mitigation techniques remain operational at optimal capacity throughout all operational scenarios.

5. The composting facility will be operated within specifications to eliminate overloading and under loading, which may increase emissions from the processes.
6. Within the proposed upgrade and increased capacity design, the following will be implemented:
 - a. The recently enclosed tunnel composting process (completed in January 2010) will be negatively ventilated to an acid scrubbing system before treatment within the upgraded odour control system.
 - b. Appropriate moisture application will be installed upon the biofilter beds so as to ensure optimal operation.
 - c. The air distribution system will be optimised so as to optimise equal air distribution within each biofilter bed and ensure efficient treatment of odours.
 - d. Optimise and implement a SCADA system, or a similar type monitoring system for the control and monitoring of the process in terms of air handling.
 - e. Optimised long life inorganic bed medium will be installed within biofilter cell 2.

9.3 AEROSOLS

The production of bioaerosols, such as actinomycetes, bacteria, fungi, antropods, and protozoa, from biowaste composting facilities has generated some concern. Several studies have been carried out both in Europe and the United States investigating the generation and effect of bioaerosols on workers and the neighbouring population at a range of composting facilities.

One such study was undertaken by a group of international experts on bioaerosols, risk assessment and composting who investigated the impact of bioaerosols on workers at composting facilities. The study found that although some types of bioaerosols (mainly *Aspergillus fumigatus*) are present in the air at composting facilities, available epidemiological evidence does not support the suggestions of allergic, asthmatic, or acute or chronic respiratory diseases in the general public at or around the several open air and one enclosed composting facility.

Their overall conclusion that 'composting facilities do not pose any unique endangerment to the health and welfare of the general public' is based on the fact that on-site workers at composting facilities were regarded as the most exposed part of the community, and where workers health was studied, for periods of up to 10 years on a composting site, no significant adverse health effects were found. A separate study showed that microbial and endotoxin emissions from an enclosed composting facility fitted with a biofilter are generally low and similar to background concentrations found in ambient air.

Most bioaerosols generated during the composting process occur during the mechanical treatment of biowaste and the first stage of composting. These processes will be fully enclosed. All process steps in the facility will be equipped with air extraction and biofilter treatment of process air. It is therefore envisaged that no significant emissions of bioaerosols will occur from the Kilmainhamwood Compost facility and that no impacts are expected.

Since it is envisaged that aerosol emissions are not significant and no potential impacts are expected, no specific mitigation measures have been identified. During the mechanical treatment of the compost,

workers will wear respiratory protective equipment, i.e. facemasks. All mechanical equipment such as front-end loader will be fitted with air filters and the machine cabins will have a positive pressure environment.

9.4 CLIMATE

At the composting facility area, approximately 56% of the total annual rainfall is recorded during the winter period (October – March). This amount of precipitation (including snow) will normally be associated with more prolonged Atlantic frontal weather depressions passing over the region compared to the summer.

The wind rose for the Clones Synoptic Station shows that the prevailing winds are from the southwest. The mean wind speed at Clones Synoptic Station is 7.9 knots. This value is also applied to the existing composting facility site.

On a local scale, the climate will not be altered by the proposed development of an extension to the existing composting facility.

Composting is a degradation process that would occur naturally and therefore the production of carbon dioxide from this process is not considered to contribute to global greenhouse gas levels. Also the composting of these materials will ensure that these materials are not sent to landfill thereby reducing methane generation due to anaerobic decomposition.

As there will be no significant impact on the local or global climate, there are no mitigation measures proposed other than the operation of the facility to BAT guidelines.

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10 NOISE AND VIBRATION

10.1 INTRODUCTION AND EXISTING ENVIRONMENT

This section explores the potential Noise and Vibration impacts associated with the proposed extension to the existing compost facility at Kilmainhamwood, County Meath. The existing environment is already a composting facility which this proposed development seeks to expand. Baseline noise levels for the area were taken from the Annual Environmental Reports for the existing facility.

10.2 SIGNIFICANT IMPACTS

The potential noise and vibration impacts associated with the proposed extension to the Kilmainhamwood Compost facility are divided between the construction and operational phases of the development.

The construction phase of the development has potential to increase noise levels at noise sensitive locations surrounding the development site. The nearest noise sensitive locations are situated at distances of approximately 400m from the existing facility and proposed extensions. Predicted noise levels have been estimated using the methodology described in BS: 5228: Noise and control on construction and open sites, 1997.

Predictions are based on typical equipment used during various constructive stages of the development. Predictions are based on a $L_{Aeq,1hr}$ value with all machinery operating for a continual period of 1 hour. This may be considered a worst-case scenario as machinery may operate for shorter periods and may not work simultaneously. Additionally, calculations are based on minimum distances between site activities and the nearest noise sensitive locations. The temporary nature of the construction period and the variety of machinery used should ensure that no construction activity is operational for long periods. This phase will therefore result in short term impacts, the noise levels predicted for the construction phase of the proposed development are in accord with guidance limit values.

For operational phase noise all of the major noise producing plant associated with the proposed development will be situated within the purpose built buildings associated with the development. The noise sources associated with the proposed development in the operational phase will consist of:

- Noise generated by site operations including 2 new loading shovels and 9 no. extraction fans; and
- Noise generated by road traffic to and from the site.

With regard to noise generated from on site activity this will be composed of typical composting facility machinery as currently used on the site as it operates at present. The majority of plant will be situated within buildings. Additional roof fans will be employed in the design of the extended portion of the operations will not cause significant impact to the nearest sensitive receptors, as they shall be similar in character and emission to those currently in operation without significant impact. All 9 of the new fans

will be placed inside the site buildings, seven new fans will be in the existing reception hall and two fans will be in the new building at the end of the process.

The predicted noise levels for both the day and night time periods are comfortably within the limits outlined in the EPA Guidance Note For Noise In Relation To Scheduled Activities.

Thorntons Recycling provided the input data for the traffic noise assessment for the proposed facility extension. HGV traffic is predicted to increase by 5.8 movements per day, and car traffic is predicted to increase by 4 movements per day.

This equates to 0.64 additional HGV movements per hour and 0.44 additional car movements per hour (on the basis of a 9 hour day). These numbers are not predicted to have any significant effect on the surrounding noise climate.

10.3 MITIGATION MEASURES

Noise from the construction phase of the project has minimal potential to increase noise levels at the nearest noise sensitive properties during this stage of the development. This phase of the development will not require proprietary noise mitigation.

As a matter of Best Practice it is proposed that various practices be adopted during construction, including:

- Appointing a site representative responsible for matters relating to noise;
- Establishing channels of communication between the Contractor/Developer, Local Authority and local Residents;
- Furthermore, it is envisaged that a variety of practicable noise control measures will be employed. These may include:
 - Selection of plant with low inherent potential for generation of noise and/or vibration;
 - Erection of temporary barriers around items such as generators or high duty compressors. For maximum effectiveness, a barrier should be positioned as close as possible to either the noise source or receiver. The barrier should be constructed of material with a mass of > 7kg/m² and should have no gaps or joints in the barrier material. As a rough guide, the length of a barrier should be 5 times greater than its height. A shorter barrier should be bent around the noise source, to ensure no part of the noise source is visible from the receiving location.
 - Siting of noisy plant as far away from sensitive properties as permitted by site constraints.

The design of the site has been laid out so as to minimise noise impact on the surrounding environment. All major noise producing plant associated with the proposed facility is to be located within the site buildings and not in the open air.

This design in itself provides significant noise mitigation advantages in that the noise reaching sensitive receptors and indeed the site boundaries is much curtailed due to horizontal distance separation.

Worst case operational noise levels are predicted to comfortably comply within the EPA *Guidance Note For Noise In Relation To Scheduled Activities* which outlines a limit of a free-field LAr, T value of 55dB by daytime (08:00 – 22:00), at any noise sensitive location and one of 45dB for night operations. As such, no further mitigation is required for the operational phase of the development.

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11 LANDSCAPE AND VISUAL IMPACT

11.1 EXISTING ENVIRONMENT

The site lands are situated at an elevation of between 60m and 88m AoD. To the east and west of the application site, the land rises gently from low hills reaching high points of 173m AoD at Carrickleck to the east and 155m AoD at Boynagh to the west.

The landscape in the immediate vicinity is generally open with a gently rolling topography, with some visual enclosure formed by field hedgerows. The amount of screening provided by the existing hedgerows depends on the height of vegetation in any particular location. There is a well-developed pattern of medium sized fields throughout the study area. In some areas, particularly in the flatter areas, the fields are larger resulting in open views across the landscape. The nature of the topography results in some visual enclosure even where there is no screening vegetation. There are open panoramic views of the landscape at higher levels.

There is a large area of coniferous forestry immediately to the southwest and northeast of the existing composting facility which prevents views into the site from views in this area.

The area is located in the landscape character area, "Teervurcher Uplands". Landscape Value is described as Moderate, Landscape Sensitivity is described as Low and Landscape Importance is Regional.

11.2 VISUAL IMPACT

The proposed extension to the composting facility will be only visible from a small number of areas to the northeast and east of the site but is generally not visible from surrounding viewpoints. The composting facility is not visible from the protected viewpoint along the R162 due to intervening existing vegetation and local topography. The Meath County Council Landscape Character Assessment describes this area as being of low sensitivity to development. The planting plan in combination with the planting plan previously submitted to Meath County Council will significantly increase the tree cover in this view and assist in the integration of the composting facility into the environment.

11.3 MITIGATION MEASURES

A planting plan has being prepared indicating woodland edge planting around the new structures. The edge planting proposed will provide a good structural character to the surrounding woodland and increase biodiversity. The planting plan includes information on species type and planting size. A maintenance plan will be prepared for at least two years to ensure good establishment of the new planting.

12 CULTURAL HERITAGE & ARCHAEOLOGY

12.1 INTRODUCTION

This cultural and archaeological heritage desktop assessment was completed by TOBIN Consulting Engineers, on behalf of Thorntons Recycling, in relation to lands at Ballynalurgan, County Meath. This assessment was based on a desktop study of published and unpublished documentary completed in February 2009.

12.2 POTENTIAL IMPACTS

There are no known archaeological monuments within the proposed extension area of the existing compost facility. The nearest recorded monument to the proposed compost facility extension works is a Ringfort (Rath/Cashel) located at a distance of approximately 200m from the facility boundary in the townland of Raloaghan. There will be no impact on any known archaeological sites or monuments from the proposed extension works at the existing compost facility. There is the potential to reveal unknown archaeological finds/features during the proposed extension works.

12.3 RECOMMENDATIONS

In order to prevent any loss to potential unknown archaeological remains, a series of mitigation strategies have been recommended.

- If any archaeology is identified during ground works, development will be halted until an appropriate level of excavation and recording can be undertaken.
- This must be undertaken by a suitably qualified archaeologist to record any sub-surface archaeological deposits and to recover any artefacts that are discovered.
- A copy of this Monitoring Report should be submitted to the Department of Environment, Heritage and Local Government for comment.

13 TRAFFIC & ROAD ASSESSMENT

The objective of the traffic and road assessment section of the EIS is to assess the impact that the proposed Kilmainhamwood Compost facility extension will have with respect to traffic considerations. The impacts are assessed by calculating the expected volume of traffic that will be generated by the extension of the composting facility and assess the impact that this traffic will have on the operational capacity of the road network in the vicinity of the development. In this case the existing entrance to the facility is assessed. Road safety conditions are also considered.

The nearest town to the site is Kingscourt and the facility is located approximately 4km south of the town. Access to the facility is provided by means of a priority entrance onto the R162.

The Kilmainhamwood Compost facility has been in operation since September 2006. Currently the facility processes 20,800 tonnes of biodegradable material, including kitchen and garden waste, per annum. The scope of the proposed extension of this facility is to increase the amount of biodegradable material processed to 40,000 tonnes per annum.

In order to determine the magnitude of the existing traffic flows, TOBIN used the results of a Manual Classified Traffic Survey that was carried out by Abacus Transportation Surveys Ltd. on the 3rd March 2009 at the existing entrance to the facility. This survey was carried out between the hours of 07.00 and 19.00 and distinguished between cars, buses, light good vehicles and heavy good vehicles.

The entrance to the composting facility connects to the R162 within an 80km/hr speed zone. Sight line requirements for entrances within an 80km/hr speed zone are 3m x 160m and this requirement will be satisfied at the existing entrance. The R162 is a regional road linking Kingscourt to Navan. This road is a single carriageway road with a carriageway width of approximately 6.0m. The speed limit along this stretch of road is 80km/hr and the road is suitable to cater for these speeds.

The volume of traffic related to existing operations at the compost facility (traffic generated by existing facility) has been derived from data gathered for the operation of the site during 2008. The traffic that is expected to be generated by the increased operations at the facility has been estimated assuming similar truck loads for the increased volumes of materials that will be processed. In addition to traffic related to the delivery of materials to or from the composting facility, the facility also employs 4 full time staff. The proposed extension of the facility is expected to increase numbers to 6 full time staff.

Based on information provided by Thorntons Recycling, the vast majority of biowaste being delivered to the site arrives from the south and through Nobber. Similarly, the vast majority of finished compost being exported from the site departs to the south and through Nobber. Hence it is assumed that all additional vehicles (generated by proposed facility extension) will be travelling to and from Nobber. This assumption corresponds with the data produced by the traffic count (3rd March 2009). From the traffic survey it can be seen that this is similarly the case for cars and light vehicles.

The results of the analysis indicate that the compost facility entrance will operate below its capacity up to and including 2025 and is capable of handling the traffic that will be generated by the proposed

extension of the facility. A link capacity assessment was carried out for the R162 which indicated that the R162 would operate within capacity up to and including 2025 where there will be approximately 66% spare capacity.

Existing warning signage is located at both sides of the facility entrance. It is recommended that additional warning signage is installed and maintained at 200m from either side of the existing compost facility entrance to warn traffic of the presence of slow moving vehicles.

It is recommended that:

- Adequate parking for both cars and HGVs should be provided within the proposed development;
- Appropriate warning signs indicating the presence of the entrance for traffic approaching from Nobber or Kingscourt should be provided and maintained;
- Vegetation at the entrance be maintained such that the appropriate visibility requirements are achievable.

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14 INTERACTION OF THE FOREGOING

The potential environmental impacts of the continuation of operations and the proposed extension of this composting facility, including the measures proposed to mitigate these impacts have been outlined in the EIS.

The result of these interactions may either exacerbate the magnitude of the impact or may in fact ameliorate it. As part of the requirements of an EIS the interaction of the impacts on the surrounding environment, need to be addressed.

The most significant possible interactions are between the following potential impacts and human beings and the material assets of the area:

- Landscape
- Air quality
- Traffic

While there is potential for the impacts to interact and result in a cumulative impact, it is unlikely that any of these cumulative impacts will result in significant environmental degradation.

It should be noted that throughout the EIS, potential interaction between various environmental criteria are discussed. The baseline assessment for this project was completed prior to the design of the facility extension, which allowed for the optimisation of the site layout design. Avoidance of impacts was used throughout the design of the proposed facility. The impact and mitigation measures proposed are designed to further ameliorate the impact of the existing facility and the proposed extension of the facility on the wider environment.

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TOBIN
Patrick J. Tobin & Co. Ltd.

NATIONAL NETWORK

Galway
Fairgreen House,
Fairgreen Road,
Galway.
Ph +353 (0)91 565211
Fax +353 (0)91 565398
E-mail galway@tobin.ie

Dublin
Block 10-4,
Blanchardstown Corporate
Park,
Dublin 15.
Ph +353 (0)1 803 0406
Fax +353 (0)1 803 0409
E-mail dublin@tobin.ie

Cork
Northpoint House,
New Mallow Road,
Cork.
Ph +353 (0)21 4308 624
Fax +353 (0)21 4308 625
E-mail cork@tobin.ie

Limerick
Bedford Place,
Howley's Quay,
Lower Shannon Street,
Limerick.
Ph +353 (0)61 415 757
Fax +353 (0)61 409 378
E-mail limerick@tobin.ie

Castlebar
Market Square,
Castlebar,
Co. Mayo.
Ph +353 (0)94 902 1401
Fax +353 (0)94 902 1534
E-mail castlebar@tobin.ie

Dundalk
2nd Floor, Elgee Building
Market Square
Dundalk
Co. Louth.
Ph +353 (0)42 933 5107
Fax +353 (0)42 933 1715
E-mail dundalk@tobin.ie

visit us @ www.tobin.ie