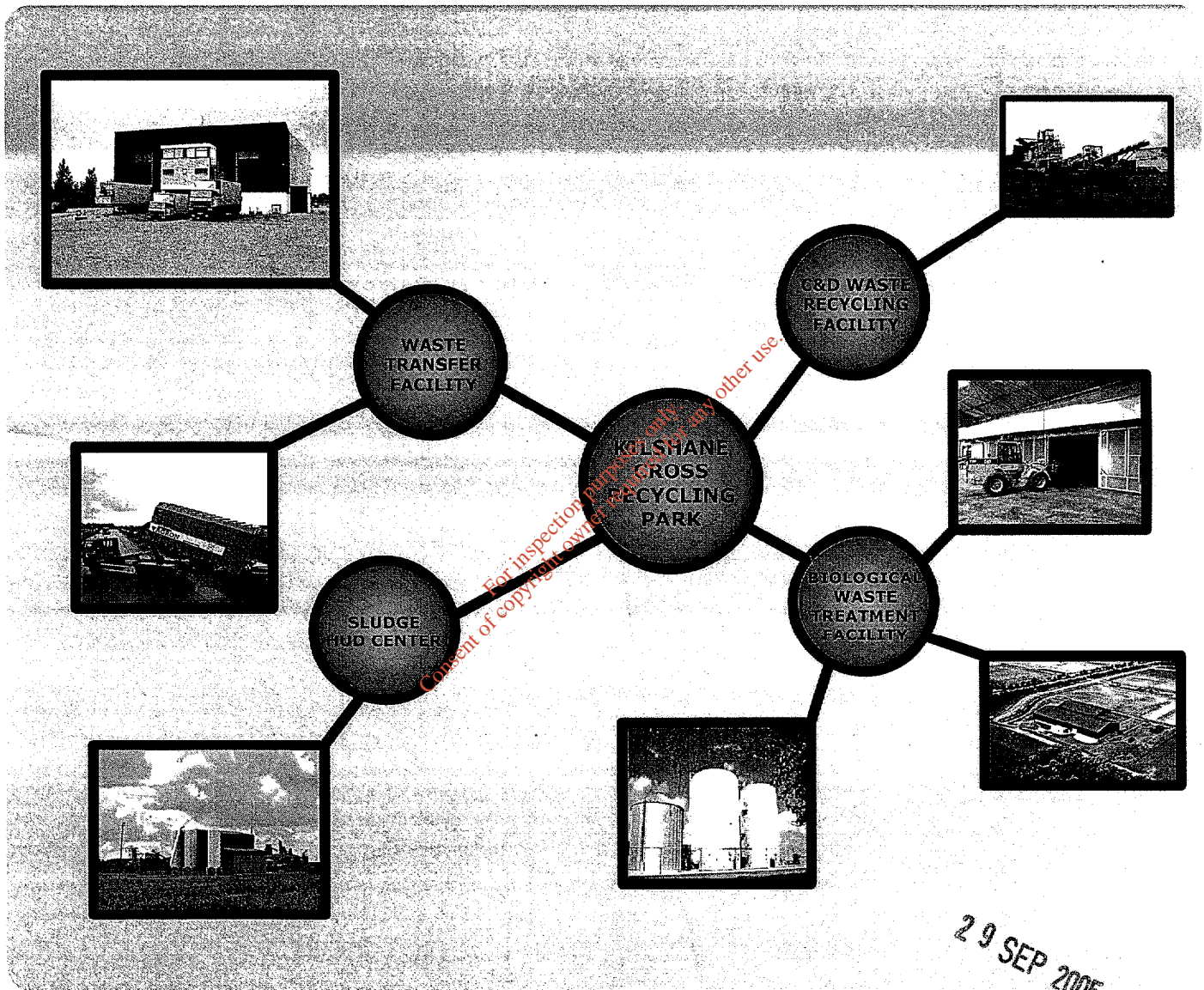




Fingal County Council
Comhairle Contae Fhine Gall

KILSHANE CROSS RECYCLING PARK



ENVIRONMENTAL IMPACT STATEMENT

VOLUME I: EIS NON TECHNICAL SUMMARY

SEPTEMBER 2005



FINGAL COUNTY COUNCIL

**KILSHANE CROSS RECYCLING PARK,
NEWTOWN, DUBLIN 15**

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ENVIRONMENTAL IMPACT STATEMENT

VOLUME I: EIS NON-TECHNICAL SUMMARY

SEPTEMBER 2005

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1. INTRODUCTION

1.1 Proposed Development

Fingal County Council proposes to develop a Waste Recycling Park at a site in the townland of Newtown, Kilshane Cross, Dublin 15. Please refer to the Site Location Map, Figure 1.1. The Recycling Park will consist the following waste management facilities:

- A **Construction and Demolition Waste Recovery Facility** processing 75,000 tonnes per annum (tpa);
- A **Biological Waste Treatment Facility** treating 45,000tpa of segregated domestic and commercial organic waste;
- A **Waste Transfer Facility** processing 65,000tpa of municipal solid waste; and
- A **Sludge Hub Centre** treating 26,511tpa of de-watered sludge cake from wastewater treatment facilities in County Fingal.

Fingal County Council is applying to the Environmental Protection Agency (EPA) for a Waste Licence and to An Bord Pleanála for Planning Approval. Fingal County Council owns the site of the proposed Recycling Park. The facilities will be developed using the Public Private Partnership (PPP) process, with each facility being developed and operated by different private contractors. The whole recycling park will be covered by a single planning approval and waste licence, with Fingal County Council being the licence and permission holders.

1.2 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.

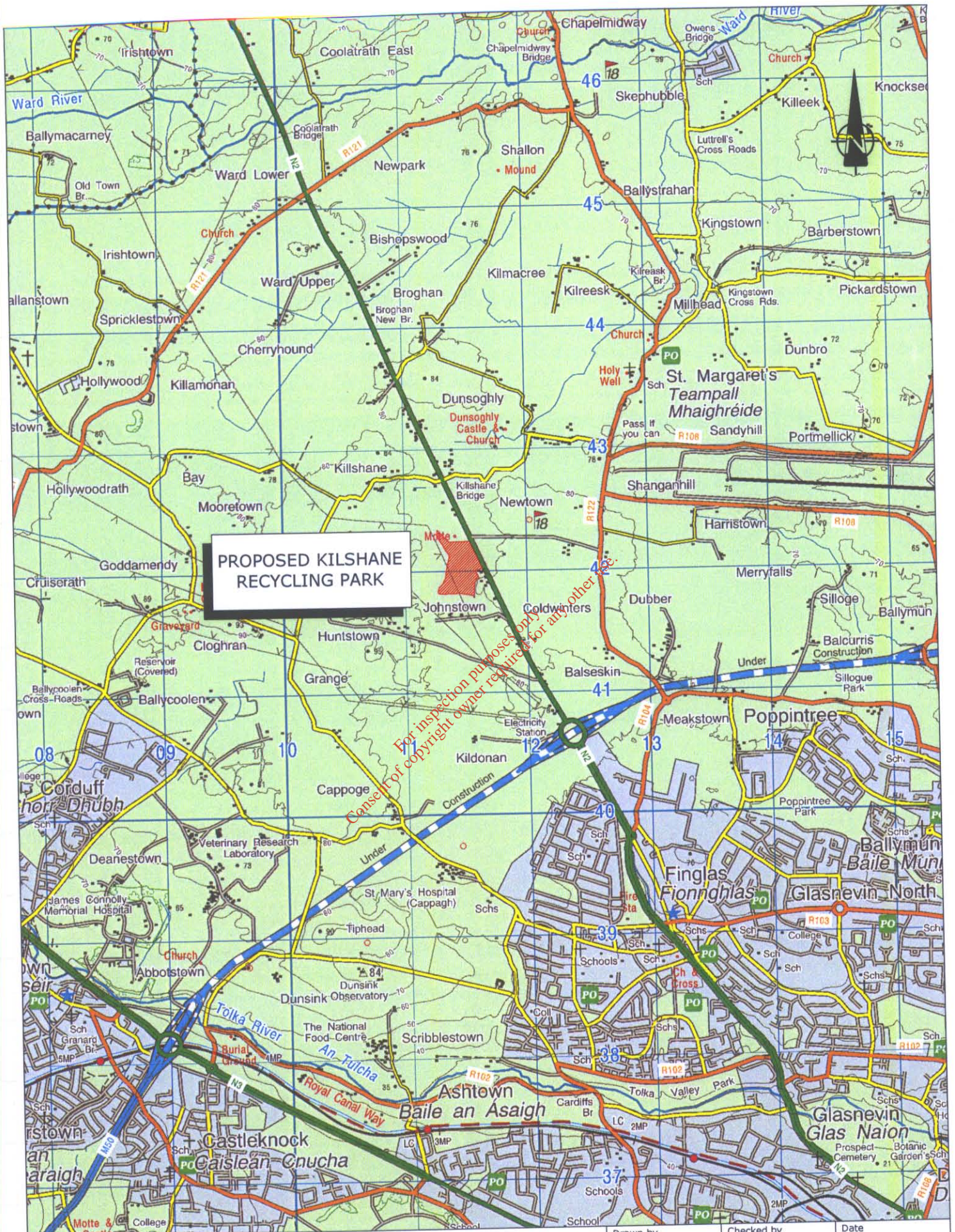
2. Background

2.1 Site Location

The Kilshane Cross site is found approximately 1.5km north of the N2/M50 interchange in the townland of Newtown, which is located within the local authority administration area of Fingal. The site is presently undeveloped. The N2: Finglas to Ashbourne Road Scheme is currently being constructed to the east of the site. The Huntstown Quarry is located to the south and west of the proposed development site. The Huntstown Power Station is located to the south of the site, adjacent to the Huntstown Quarry and there is also an ESB transmission station located further to the south, adjacent to the M50. Dublin airport is located approximately 5km to the east of the site. There are a number of businesses to the east and north along the N2 in the vicinity of the site. The Coldwinters Golf Club is located to the east of the site. The golf course is currently closed while the N2: Finglas to Ashbourne Road Scheme is being constructed.


2.2 Site Suitability

The Kilshane Cross site is the most appropriate location of each of the proposed facilities. Grouping the facilities in one site allows for economies of scale in relation to transportation, planning, licensing and land costs. The site's location on the N2 provides easy access to the M50, other primary road routes and all parts of the Fingal County Council functional area, as well as the other Dublin Local Authority Areas. The Kilshane Cross site is close to the centroid of waste generation of both household organic waste for the North Dublin Region and of household residual waste for Fingal County. There are a number of existing large-scale developments in the vicinity of the site and the new N2; Finglas to Ashbourne Road Scheme is currently under construction adjacent to the site.



**PROPOSED KILSHANE
RECYCLING PARK**

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Client FINGAL COUNTY COUNCIL	Drawing Title	Drawn by Dermot Burke	Checked by Sean Finlay	Date September 05
Project KILSHANE CROSS RECYCLING PARK	LOCATION MAP	 <p>BLOCK 10.3 BLANCHARDSTOWN CORPORATE PARK, DUBLIN 15 IRELAND TEL 01 8000401 FAX 01 8000410 email administration@tes.ie</p>		
Drawing No. FIGURE 1.1	Scale 1/40,000			

2.3 Limitation of the EIS Process

The detailed engineering specifications of the different elements of the Recycling Park are not fully known. This is due to the fact that the proposed facility will be developed using the Public Private Partnership (PPP) process. The exact nature of the contractual arrangements has also to be finalised. The PPP process will require the bidding contractors to submit their preferred designs for consideration. The EIS has considered the worst-case scenario, and/or has specified design limits on emissions necessary to meet emission limits or designated standards. The specific environmental limits specified by the EPA will be incorporated into the Contract Documents of the final contract in terms of design envelopes. These design envelopes will clearly define the range of emissions that will be permitted, and each submitted proposal will be examined to ensure strict adherence with the appropriate design envelopes.

2.4 Consultation

A comprehensive consultation process has been followed to date in respect of the proposed facility. The consultation process consisted of consultation with the public, competent bodies, statutory bodies and other interested parties from an early stage of the compilation of the EIS. The primary objectives of the consultation process followed were to aid the scoping of the EIS and to fully brief all the interested parties of Fingal County Council's proposal and to ascertain their observations.

3. Existing Environment

3.1 Human Beings/ Socio-economic

The majority of the area surrounding the proposed development site is designated as rural and green belt, characterised by scattered individual dwellings and development clusters, often along main roads; a mix of traditional farm based dwellings; small newer houses; and a few larger dwellings set in grounds. There are a limited number of residences likely to be directly or indirectly impacted upon by the proposed development. There are 15 dwellings within a 1 km radius of the site of the proposed development. The majority of the houses are located to the north and east of the site along the N2. The proposed development site is not used as a tourist amenity and is currently fallow agricultural land. The proposed site is not contained within or is not located adjacent to any area of high natural beauty, high quality landscape character, views or prospects, listed buildings, scenic routes, amenity use designated areas, proposed Natural Heritage Area, European sites, Special Areas of Conservation, or Special Protection Areas. In addition, it does not interfere in any manner with the cultural heritage of the area. This proposed enterprise will provide employment for at least 80 people directly over its lifespan as well as further indirect employment for service personnel.

3.2 Flora & Fauna

The site is composed of a single large field of semi-natural grassland, surrounded by hedgerow on the western and southern boundaries. It is partly bounded by hedgerow to the east. The remainder of the eastern boundary comprises of an earthen embankment topped with wire and post fencing. The western boundary also coincides with a small stream. No physical boundary delineates the proposed site to the north. There are two designated nature conservation areas located within 5km of the site, namely, Santry Demesne and the Royal Canal. The habitats on site are dominated by a low to moderate diversity grassland classified as Dry Meadows and Grassy Verges. A number of hedgerows form the boundaries of the site. Furthermore, a small stream flows along the western boundary of the site. These habitats are considered of moderate to high local ecological value. Fauna noted on site are considered typical of agricultural habitats and are common and widespread.

3.3 Geology

The subject site is mostly underlain by soil described as a deep well drained mineral soil derived from mainly basic parent materials. The soils in this category include Grey Brown Podzolics and Brown Earths. The results of site investigations, i.e. trial pits and boreholes, revealed the subsoils were a mixture of silt and clay – rich tills with a variable content of sand, gravels, cobbles and boulders. This geology is consistent with the general subsoil reported by the Geological Survey of Ireland for this area of County Dublin. The bedrock encountered during the site investigations varied between firm dark grey, limestone and weathered orange/yellow bedrock, with no evidence of fresh bedrock. There are three bedrock formations underlying the proposed site. The formations are classified by the Geological Survey of Ireland (GSI) as the Malahide Formation, the Waulsortian Limestone, and the Tober Colleen Formation. An aquifer classification by the GSI describes the Waulsortian Limestone and the Malahide Formation as Locally Important Aquifers, which are moderately productive only in localised zones. The Tober Colleen Formation is classified as a Poor Aquifer, which is generally unproductive except in localised zones.

3.4 Water

The proposed site is within the River Ward catchment. A number of tributary streams contribute to the overall flow in the River Ward along its course. A tributary stream of the River Ward, St. Margaret's Stream, flows from south to north and forms the western boundary of the site for approximately 470m. This stream feeds into the River Ward, which is located approximately 4.5 km to the northeast of the site. The EPA Water Quality Database, as presented on the EPA website, indicates that the water quality in the River Ward is Moderately Polluted.

St. Margaret's Stream was sampled at 2 No. locations as part of the baseline assessment of water quality. The analytical results concur with the EPA water quality ratings for the River Ward and indicate that in general the water quality in St. Margaret's Stream is moderately polluted. To assess the hydraulic characteristics of the site, 3 No. boreholes were drilled. The water levels in the boreholes indicate that the groundwater flow direction is from north to south, which is the opposite of the surface water flow direction. The difference between the groundwater flow direction and the surface water flow direction is considered to be due to dewatering within Huntstown Quarry, which is located immediately to the south and west of the subject site. The reported concentrations for all parameters were within the corresponding Maximum Admissible Concentrations as quoted in the Drinking Water Regulations with the exception of the detected

values for ammoniacal nitrogen, manganese, nitrite and iron. The Geological Survey of Ireland has not, as yet, classified the groundwater vulnerability of the area of the proposed development. Given the nature of the subsoil revealed at the subject site and the depth to bedrock proven in the boreholes drilled at the site, a low vulnerability rating is considered appropriate for the entire site.

3.5 Climate

There is no meteorological data specific to the proposed site. In order to give reliable climatic data on a particular area a weather station should be in operation for at least 30 years. The closest rainfall gauging station is located at Dublin Airport, which is approximately 5km east of the site. The 30-year annual average rainfall for the area is 733mm. Information from Dublin Airport states that the prevailing winds are from the southwest, with lesser wind flows from the south and west.

3.6 Air: Dust

Dust deposition levels at the site were monitored on a number of occasions, covering different seasons. The results of testing showed that dust deposition levels were below the guideline limit of 350 mg/m²/day.

3.7 Air: Air Quality

A baseline monitoring survey was carried out at the site of the proposed development using a range of air monitoring techniques. The dominant source of Nitrogen Dioxide (NO₂), Sulphur Dioxide (SO₂) and particulates in the area appears to be from motor vehicle exhausts, the burners/boiler heating local residences and the close by industrial processes. The measured concentrations at all monitoring locations are within the Irish and EU Ambient Air Standards.

Hydrogen Sulphide (H₂S) is used as an indicator gas for the assessment of significant odour nuisance in the vicinity of wastewater treatment plants and composting facilities. The World Health Organization (WHO) recommends that in order to avoid substantial complaints about odour annoyance among the exposed population, hydrogen sulphide concentrations should not be

allowed to exceed 0.005 ppm (5 ppb; $7 \mu\text{g m}^{-3}$), with a 30-minute averaging time. H_2S concentration levels at the site did not exceed 4ppb. Bioaerosols were also monitored at the existing site and it was established that minimal Bioaerosol impact exists on the current site.

3.8 Noise & Vibration

Typical noise sources in the vicinity of the site include the emissions from road traffic flow on the National Primary Route (N2) to the east, the passage of aircraft overhead at low altitude running east to west, noise emissions from the Viridian Power Plant to the south and noise emissions from the Roadstone quarry to the west and south of the site.

3.9 Landscape

The general landscape surrounding Kilshane Cross is predominantly low lying rural agricultural land. This agricultural land is comprised of both improved and unimproved pasture and arable. The fields are broadly rectangular and medium to large in size and open in character; field boundaries are predominantly hedgerows and earth banks. The site falls into the Landscape Character Area, Low Lying in the Landscape Character Assessment of the Development Plan for 2005 to 2011; it is described as, "A mixture of pasture and arable farming on level land with few views or prospects. The landscape character is increasingly being influenced by urban fringe development of Dublin. Residential settlement in the area is typical of rural areas and occurs at regular intervals along the local road network, mostly in small clusters."

3.10 Cultural Heritage

There is an archaeological monument (Recorded Monument 14:13) recorded as a "motte and bailey (possible)" in the Sites and Monuments Record (RMP) for County Dublin adjacent to the site of the proposed development. No surface trace of the site survives above ground today, however the site is visible as a soil mark on aerial photographs taken by the Fairey Survey of Ireland 1971 and the Ordnance Survey colour aerial photography. The area around the motte and bailey (site of) has been the subject of numerous archaeological testing and monitoring works, however no feature or finds of any archaeological nature were located.

3.11 Infrastructure & Transport

The proposed site is located on land, owned by Fingal County Council, immediately abutting the N2 National Primary Road, on the south side of the N2, approximately 1.5km north of the M50/N2 interchange. Access to the lands is directly from the N2. Figure No. 1.1 shows the location of the site in relation to the surrounding road network. The site is easily accessible from the R125, R121, Kilshane Cross/Airport Road as well as the M50. The N2: Finglas to Ashbourne Road Scheme is being constructed adjacent to the proposed site, from the existing junction of the N2/M50 to a point some 3km north of Ashbourne in County Meath. The N2 between the M50 and Kilshane Cross carries very substantial volumes of traffic. Recent traffic data from the National Roads Authority (NRA) for the counter on the N2 was 19,541 vehicles per day , with a HCV¹ content of 14%.

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¹ HCVs are taken to include trucks, artics, buses, agricultural vehicles and miscellaneous goods vehicles (based on the definition given by the NRA in 'National Roads and Traffic Flow 2002')

4. PROPOSED DEVELOPMENT

It is proposed to develop four separate waste management facilities at the Kilshane Cross Recycling Park site, i.e. a Construction & Demolition Waste Recovery Facility (C&DWRF), a Biological Treatment Facility (BTF), a Waste Transfer Facility (WTF) and a Sludge Hub Centre (SHC). Please refer to the proposed Site Layout Map, Figure 4.1. The facilities will be developed using the Public Private Partnership (PPP) process, with each facility being developed and operated by different private contractors. The whole Recycling Park will be covered by a single planning approval and waste licence, with Fingal County Council being the licence and permission holders.

The exact nature of the treatment processes or technologies will emerge from the procurement process and thus have yet to be agreed. The following is a brief description of the processes to be carried out at each facility.

4.1 Construction & Demolition Waste Recovery Facility (C&DWRF)

The C&DWRF will mainly deal with the recovery of construction and demolition (C&D) waste from industrial, commercial and household sources. The materials to be treated will mainly consist of soil, rubble, old road material, reinforced concrete, bricks, blocks, etc. This material will be brought on-site in bulk haulage vehicles and large skips, and will be the result of large development and infrastructural projects. The facility will produce a variety of aggregate types depending on the final market for the material. This material will be stockpiled in a designated area of the site and it will be sold as an aggregate product.

All waste upon arrival at site will be weighed at the facility weighbridge and will be directed to the outdoor reception/ processing area. The unprocessed C&D waste will be fed into a hopper by a grab crane or loading shovel depending on the type of material. From the hopper the material will be fed into a mobile crusher and the crushed material will go by conveyor belt to a screening rig. Before the screens, the conveyor passes a magnet, which extracts steel and metal (e.g. reinforcing bars) from the crushed material. The screens sort the crushed material into different aggregate sizes and put them into stockpiles depending on size. The grade of material recovered will be largely dependent on available market outlets and the processing equipment will have the flexibility to produce a number of grades.

The aggregates produced will be tested for their suitability as a civil engineering material. The materials produced at the facility will have to match the properties of virgin building materials in order to compete in the market.

4.2 Biological Treatment Facility (BTF)

The BTF will utilise either aerobic in-vessel composting or anaerobic digestion (AD) to treat biowaste collected in the Dublin Region. Other waste streams may also feed into the facility and include separately collected kitchen waste from restaurants, hotels and other commercial sectors. The exact process to be used in the BTF will emerge from the procurement process.

In-vessel Composting

The composting facility will be fully enclosed in a large building and will comprise the following elements:

- Waste reception area;
- Pre-treatment area;
- In-vessel composting units;
- Maturation pads;
- Odour abatement systems;
- Process control and monitoring equipment; and
- Post treatment and bagging area.

The processing steps of the in-vessel composting systems will include waste acceptance and pre-treatment of incoming waste, biological processing, maturation, post treatment, and process control and monitoring. All waste to be accepted at the facility will be inspected and deposited in the enclosed waste reception area, where it will undergo pre-treatment. Removal of contaminants from the feedstock will assist in producing high quality compost. Once the material has undergone the relevant pre-treatment processes the waste will then be placed in the in-vessel units and the in-vessel composting process will begin.

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Legend:
FENCING LEGEND
 TYPE 1 FENCING - WALL & RAILING ENTRANCE FENCE
 TYPE 2 FENCING - PALISADE SECURITY TYPE FENCE
 TYPE 3 FENCING - WIRE & POST TYPE FENCE

— SITE ACTIVITY BOUNDARY

Extract from OSI 6 Inch Series Sheet No. 13 Dublin
 NOTE: Ordnance Survey Ireland Licence No. 03001602
 © Ordnance Survey Ireland Government of Ireland

- 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 of any discrepancies before any work commences.
 4. All levels relate to Ordnance Survey Datum at Main Head.

Rev.	Revisions	date	int

Client



Fingal County Council
 Comhairle Contae Fhine Gall

Project
KILSHANE CROSS RECYCLING PARK

Drawing Title
PROPOSED SITE LAYOUT PLAN

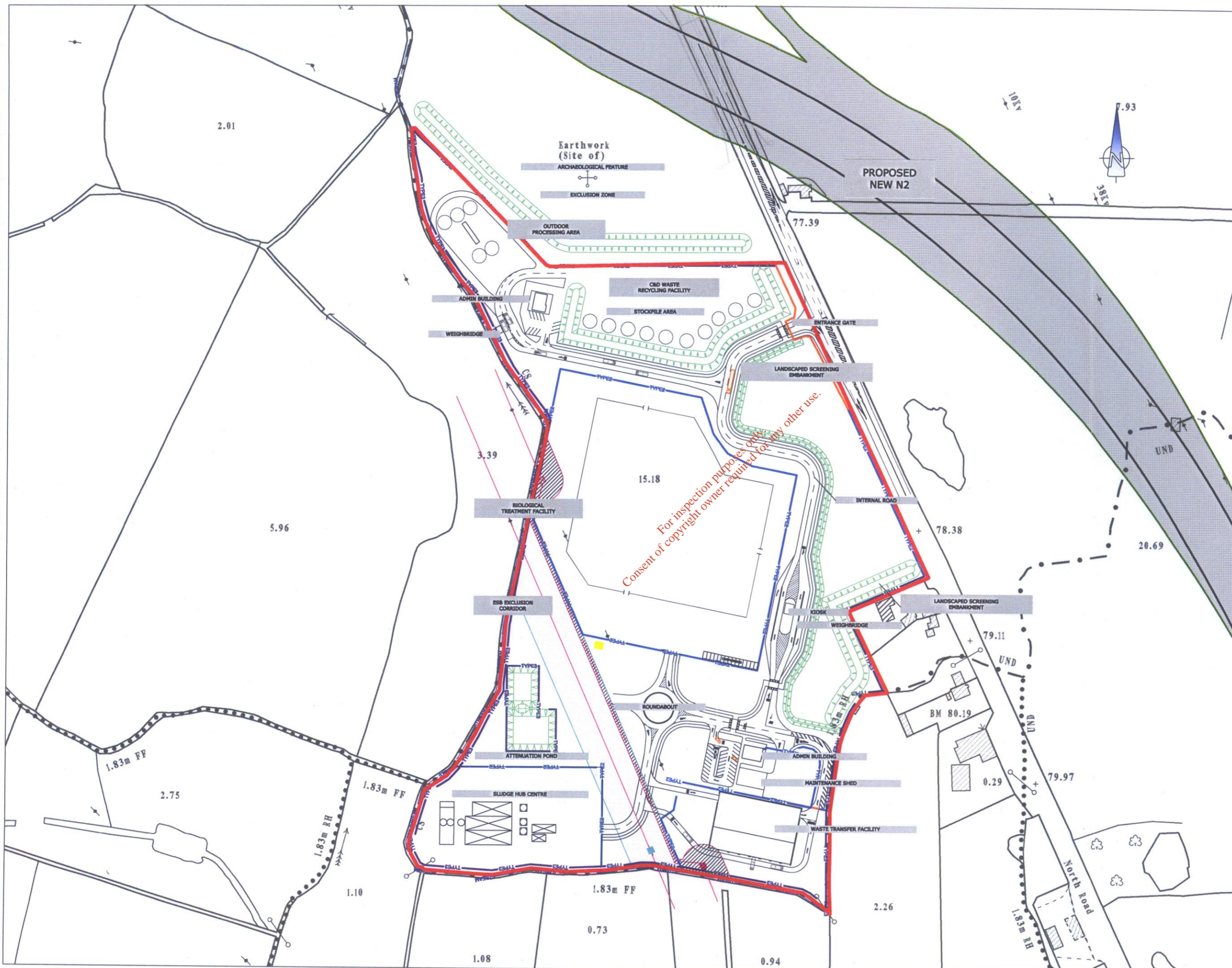
Scale 1 : 2,500 @ A3
 Drawn by Colin Peacock Checked by Date September 2005

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Drawing No. **Figure 4.1**

Rev.				



In-vessel systems supply optimum conditions for microbes to live and breakdown the waste by providing optimum temperature, aeration and moisture in an insulated system. Maintaining high temperatures (60-65°) within the vessel will ensure that a sanitised product will be produced. The principle of in-vessel composting systems is to maintain these optimum conditions for as long as required. Residence times in in-vessel systems can vary from a few hours to approximately 2 weeks.

Maturation usually takes place by placing piles of the treated material on aerated floors, which continue to supply air to the material. Maturation periods usually last for 6-8 weeks depending on the quality of the product required. Additional screening of the finished product may also be required to remove further contaminants from the product. In-vessel composting processes are typically fully automated, which allow site operators to continuously monitor key process parameters such as pH, temperature, moisture content, aeration, etc. Monitoring and control of the above parameters will ensure that the process runs efficiently and that there are no significant impacts on the environment.

Anaerobic Digestion

Anaerobic Digestion (AD) is a biological process where organic waste can be broken down by micro-organisms in the relative absence of oxygen to produce a mixture of biogas, solid digestate and nutrient rich wastewater. Biogas consists primarily of a mixture of Methane (40-70%) and Carbon Dioxide (30-60%), with small quantities of hydrogen, hydrogen sulphide, and ammonia present. Biogas is commonly used in a Combined Heat and Power (CHP) station to produce electricity and heat through a gas engine and steam boiler. Energy produced can be used to fuel the AD plant and the excess can be exported to the national grid or can possibly be used to provide power to the other facilities in the Recycling Park.

- The main elements of an AD processing facility comprise:
- Waste reception building;
- Pre-treatment area;
- Pasteurisation plant – to meet Animal By-Products Regulations
- Gas handling equipment such as pipes, valves, flares, gas cleaning and storage equipment;
- Gas engines, turbines and electricity generators;
- Steam generators - to provide heat to the digester;

- Digestate dewatering equipment such as presses, centrifuges, effluent storage;
- Maturation pads;
- Odour abatement systems;
- Process control and monitoring equipment; and
- Pre and post-treatment equipment such as screens, magnetic and eddy current separators.

All waste to be accepted at the facility will be inspected and deposited at the enclosed waste reception building where it will undergo pre-treatment. Once the material has undergone the relevant pre-treatment processes the waste will then be placed in the digester and the AD process will begin. Digesters are usually constructed of steel and/or reinforced concrete. Reactors may be vertical or horizontal depending on the technology. The reactor volume will depend on the volume of waste throughput and the residence time.

Centralised anaerobic digestion plants (CAD plants) can be mesophilic (about 35°C) or thermophilic (about 55°C). The digesters operate mainly as plug flow systems, with fresh material being fed into the mixed batch which is allowed to spill out into the overflow. Processing times in digesters can vary between 12-30 days, depending on parameters such as feedstock composition, process type and temperature. Once the AD process has been brought to completion in the digester, the digestate that has been produced is removed and processed further. Compost/digestate fibres will be matured on maturation pads for a period of time following which, a fully stabilised and mature compost product will be produced.

The biogas will generally need to be cleaned by removing sulphur and dust, and is dried to prevent corrosion. Biogas is commonly used in a CHP station to produce electricity and heat through gas engines and a steam boiler. Process air will be extracted to an air treatment unit to remove dust and particles, and any odorous compounds in the exhaust air.

4.3 Waste Transfer Facility (WTF)

In the future, large articulated trailers will be required to transfer waste to other waste treatment facilities, i.e. landfill facilities, the material recovery facility, the thermal treatment unit, etc. This will involve the transfer of residual waste at the proposed WTF on-site from Refuse Collection Vehicles (RCVs) to large articulated trailers. After weighing and logging at the weighbridge facility, the municipal solid waste will enter the facility in RCVs. The RCVs will reverse into the

WTF and will then empty their loads onto a large tipping floor in the building and will exit the WTF via the same doorways they entered. The tipped waste will then be transferred to large volume articulated trailers, which will be able to hold approximately 20 to 22 tonnes of waste. The exact method of waste transferral will emerge from the procurement process. The WTF will be under slight negative pressure and the collected air will be transferred to an air treatment system. This will mitigate the emission of any odours generate during the transferral process from the WTF.

4.4 Sludge Hub Centre (SHC)

The SHC will treat municipal sludges generated in the functioning area of Fingal County Council by the thermal drying process. The facility will take in raw and digested sludge cake from the satellite sites and treatment works. The preferred procurement route for the development is under a Design Build Operate (DBO) contract using the restricted procedure, involving a 20 year operating period. The successful tenderer will have to submit a design incorporating the best practicable technology that demonstrates minimal environmental effects during the construction and operation of the facility.

Thermal drying produces a granulated or pelletised product with a very high dry-solids content (in excess of 90%), by direct or indirect application of an external heat source to dewatered sludge cake. Drying is achieved either by convection drying when hot gas / air is blown through the sludge or by conduction drying whereby the sludge is brought into contact with a heated surface. In the case of convection drying, the gas/air flowing through the drier can be heated directly or indirectly. Thermally dried sewage sludge is commonly used in agriculture and can be used as a fuel substitute in municipal waste plants, cement and brick kilns and industrial furnaces.

The liquor generated by the treatment process is typically high strength (in particular having a high Biochemical Oxygen Demand² and ammonia content) and a treatment and disposal route is required for this waste stream. Partial treatment on-site of the liquor will be undertaken with discharge to the existing Dublin sewerage system and will have to meet daily load limits.

The treatment process offered by the DBO contractor will also be subject to operational limits

² A measure of the organic matter present.

e.g. for noise, odour and air quality, i.e. the process will operate without exceeding specified limits for noise and odour levels, and ground levels of atmospheric pollutants.

In addition to the four facilities describe above the will also be a main administration building, weighbridge facility and a maintenance building at the Recycling Park.

4.5 FACILITY OPERATION

The Kilshane Cross Recycling Park will operate between the hours of 07:00 and 22:00 Monday to Saturday and will normally be closed on Sundays and on Bank Holidays. The facility will also be open for waste acceptance during these hours. Maintenance out of hours may also be required for emergency breakdowns etc.

The operation of the proposed waste management facility at Kilshane Cross will be undertaken under licence issued by the EPA. The conditions of the licence will include measures to minimise or prevent nuisance to the public occurring as a result of the operation of the facility.

Potential nuisances such as odours, dust, noise, litter, vermin, etc. will be addressed with the implementation of the operational plan for each facility to be developed, whereby all activities at the proposed facilities will be carried out in a controlled manner, thereby minimising the possibility of these nuisances.

Monitoring points in accordance with EPA requirements will be established at the site. The primary aims of the monitoring programme are to comply with legislation and the requirements of the EPA and to quantify the quality of the environment in the vicinity of the proposed facility and identify any adverse impacts from the development of the Recycling Park.

Emission Limit Values (ELV) will be set by the EPA for many of the parameters to be monitored. Exceeding these values will be judged by the EPA to be a non-compliance of the Waste Licence.

Contingency plans will be put in place for each of the facilities, and all accidents and other emergencies will be handled by calling in the relevant authorities including the Fire Service, Gardaí, or Ambulance Services All site operatives and other relevant employees of the facilities will also be trained in emergency response procedures and in fire prevention and control.

5. POTENTIAL IMPACTS AND PROPOSED MITIGATION MEASURES

5.1 Human Beings/ Socio-economic

There are a limited number of residences that will be impacted negatively upon by the proposed Kilshane Cross Recycling Park. There are 15No. dwellings within a 1km radius of the proposed development. The majority of those residing within a one-kilometre radius of the subject site will not have their social or travel patterns disrupted and will encounter little or no change to their existing situation. The proposed site of the Recycling Park is not contained within or is not located adjacent to any area of high natural beauty, high quality landscape character, views or prospects, listed buildings, scenic routes, amenity use designated areas, proposed Natural Heritage Area, European sites, Special Areas of Conservation, or Special Protection Areas. The day-to-day operation of the Recycling Park, including the workings associated with all machinery and visitors to the site will be undertaken in compliance with all health and safety laws and regulations. There will only be one vehicular/pedestrian entrance to the subject lands, which shall be properly and secured against unauthorised access and trespass.

5.2 Flora & Fauna

There are no designated areas in the direct vicinity of the proposed site. There are 2No. sites within 5km of the site, namely Santry Demesne and the Royal Canal. Neither of these sites will be impacted either directly or indirectly by the proposed development. The principal habitat occurring on the site is Dry Meadows and Grassy Verges. This habitat type is considered to be of moderate local ecological value. The majority of this habitat will be removed as part of the proposed development, resulting in a moderate permanent impact on local ecology. Several hedgerows occur along the boundaries of the proposed site. These are considered to be of moderate to high local ecological value. Fauna recorded on the proposed site are regarded as common and widespread. The proposed development will not have any significant impact on existing fauna. Hedgerows will be retained where possible. The stream on site will not be affected and all water generated on site is to be attenuate and treated prior to controlled discharge. Strict controls will be implemented to avoid pollution or sedimentation of the stream during the construction phase.

5.3 Geology

The proposed development will involve the removal of subsoils at the site to facilitate construction and to create level platforms for construction. This is a direct permanent impact but is not considered to be a significant negative impact. The operation will have no potential impacts on the soil and geology aspect of the environment. The development will result in a permanent covering of part of the site with roadways, paths and other impervious surfaces. Land to the north of the site boundary will remain as agricultural land. The removal of subsoil is an inevitable consequence of implementing the proposed development and no mitigation measures could be proposed. Any material removed off site will be done so in accordance with the Waste Management Act and Regulations. Topsoil and other soils that can be used for amenity purposes will be stockpiled on the site for use in the final landscaping of the development. There is no requirement for monitoring of the soils post construction.

5.4 Water

It is estimated that runoff would be generated from c. 70% of the site that will be covered with impermeable surfaces. A drainage system will be installed to accommodate this runoff. The generation of additional runoff is a direct, long-term effect but is not considered to be a significant negative impact. There would be reduced recharge to the ground in the area of the impermeable surfaces. However, this reduction of potential recharge to underlying groundwater resources is not considered to be a significant negative impact. As part of the water management system, it is proposed to discharge treated water runoff to the St. Margaret's Stream. This could have a potential negative impact on the water quality in the stream. However, the correct design and use of attenuation ponds, petrol interceptors and grit traps will prevent the occurrence of surface water contamination. The subject site is underlain by bedrock that is considered to have poor potential for groundwater resources, and there are no private groundwater abstractions between the subject site and the St. Margaret's Stream, which is considered to be the discharge zone for groundwater moving beneath the site.

Surface water and runoff will be diverted through a drainage system to an attenuation pond on site where settlement will occur before discharge to St. Margaret's Stream. Runoff will also be diverted through grit traps and petrol interceptors prior to discharge. A discharge licence will be required for this activity and the runoff will meet the quality standards defined in the licence. The proposed drainage system, described in Section 3.2.13, will ensure that the release of particulate

matter (mainly grit and dust) to St. Margaret's Stream will be minimal and consequently there will be no significant adverse impact on the surface water quality. During the construction phase all water to be discharged off-site will be undergo treatment prior to discharge to ensure that it does not adversely impact on the surface water environment.

5.5 Air: Dust

The main potential impact from dust at the proposed facility will be from the outdoor C&DWRF. The closest receptors are the residences adjacent to the eastern boundary of the site, along the existing N2; approximately 220m to the southeast. The prevailing wind direction in the vicinity of the site is from the southwest (Refer to Section 2.5.2.3), which means that the C&DWRF is effectively upwind from the residences and the potential for dust impact to these residences is negligible. The nearest properties downwind to the C&DWRF are approximately 300m to the northeast. Potential for dust impact from the facility will be reduced by the elevated section of the new N2 motorway, which is located between the houses and the site of the C&DWRF. It is considered that the rest of the facility operations will not be a source of significant dust. In order to mitigate dust emissions on-site, most areas of the site that traffic will be on will be paved. Hardstand and paved areas will be sprayed with water when necessary, to avoid dust generation. A 3.5m high soil berm will be constructed around the material processing and stockpiling area of the C&DWRF, in order to mitigate the potential impact of dust generation at the facility.

5.6 Air: Odours

As the proposed Recycling Park is a Design/Build/Operate (DBO) project, quantifying odour emissions from the site is difficult. For the BTF, raw materials for composting can be odourous due to the development of anaerobic zones within the input material. The rate of release of odourous compounds into the atmosphere at composting operations is influenced by:

- Long residence time of accepted input product in containers and on-site;
- Temperature of accepted raw materials (increased temperature causes increased anaerobic conditions and volatilisation of odourous compounds);
- The concentration of odourous compounds in the solid phase exposed to air and exposed surface area;
- Processes that generate turbulence like mixing and screening processes;
- Excess moisture;

- Incorrect Carbon: Nitrogen ratio;
- Maintenance of oxygen rich conditions within the composting operations;
- Tipping, screening and shredding of raw materials;
- Non-homogenous aeration and mixing;
- Inappropriate storage of finished material.

The rate of release of odourous compounds into the atmosphere at Anaerobic Digestion operations is influenced by:

- Long residence time of accepted input product in containers and on-site;
- Temperature of accepted raw materials (increased temperature causes increased anaerobic conditions and volatilisation of odourous compounds);
- The concentration of odourous compounds in the solid phase exposed to air and exposed surface area;
- Processes that generate turbulence like mixing and screening processes;
- Positive sour gas release from the pressure release manifolds;
- Gas leakage due to start/stop operation of gas compression engines and flare.

Odours from Waste Transfer Station operations may arise due to:

- Waste tipping;
- Waste movement through front-end loader operation. Sealed refuse sacks are broken easily and emit odourous compounds and trapped gases;
- Waste movement through use of grab; the waste is removed and tipped into the trailer using a grab. This movement allows for the stripping and volatilisation of odourous compounds from the waste matrix. Waste refuse sacks are squeezed and odourous gases are released;
- Waste storage within the building has the potential to contaminate any air in contact with the waste. Also anaerobic conditions proliferate and the waste “cooks”;
- Other minor sources include waste trucks, waste storage trucks, grease traps, oil separator and exposed manholes around the yard.
- All dirty surfaces especially in warmer summer months radiate odour;
- Dust deposits within the building radiate odour and increase background odours within the building;

Odours from Sludge Hub Centre operations may arise due to:

- Delivery of sludge to site in skips may lead to the fugitive emissions of odours during emptying,
- Pumping of sludge from tankers can release odours from the storage tank and pressure release manifold on tanker. Negative ventilation will be provided on the sludge storage tank and all odourous air treated in and Odour Control Unit (OCU),
- Depending on the drying technology, incomplete combustion of odours within the combustion chamber of the sludge drying plant can be emitted untreated,
- Cyclic loading on the OCU may allow for the release of odours from the sludge drying OCU. This will be considered during the design of the OCU,
- Leaks around fans can lead to the emissions of odours from the sludge drying equipment.
- Particulate removal from the odour stream is essential for efficient operation of the sludge drying OCU,
- Open sludge storage areas may cause odours. All sludge storage will be enclosed.

A worst-case odour emission scenario was modelled for the Recycling Park using an atmospheric dispersion model, worst-case meteorological year and worst-case odour emission data to predict any potential odour impact in the vicinity of the proposed Kilshane Cross Recycling Park. It was concluded that during operation of the Kilshane Cross Recycling Park, with considered abatement protocols implemented, no odour impact will be registered by residents living in the vicinity of the facility. During DBO procurement, odour emission limit values will be used for specification. Maintaining good housekeeping practices and implementing an odour management plan for the operators of the Kilshane Cross Recycling Park will mitigate potential for odour impact.

5.7 Air: Pollutants

The operation of the proposed processes at the Recycling Park will lead to emissions of air pollutants and by using atmospheric dispersion modelling, the potential impact of these pollutants were assessed and compared to relevant ambient air quality objectives and limits. Background air quality data was obtained from on-site assessment and review of the available baseline air quality data generated by the Irish EPA. The main compounds assessed include oxides of Nitrogen (NO_x), Carbon Monoxide (CO), Sulphur Dioxide (SO_2), Total Organic Carbon (TOC), particulates (PM), Hydrogen Fluoride, Hydrogen Chloride and Formaldehyde. The results of the modelling showed no exceedences on air quality impacts for the modelled parameters.

5.8 Noise

In terms of noise impact, the proposed development will generate potential noise impacts from the construction of the all the facilities, the operation of the completed facilities and the subsequent road traffic flow associated with operation of the completed facilities. Construction activities on a large site have the potential to generate considerable levels of noise. Noise emissions are associated both with the movement of construction traffic to and from the site, and the operation of equipment on the site e.g. excavators, lifting equipment, dumping trucks ready-mix trucks etc. The noise level predictions from the increase in road traffic flow attributable to construction will be negligible along the N2 at less than 0.2 dB(A).

For the operation of the completed facilities, the potential for noise generation will come from the plant, vehicles and equipment to be utilised at the facilities. The predicted noise levels assume that all mobile and fixed plant is operational together and that all these main noise sources are housed inside a building structure / envelope giving an overall sound transmission loss of 15 dB(A). The maximum predicted noise impact at the closest noise receptor, i.e. the residences adjacent to the southeast boundary of the site, is 46.2 dB(A).

The principal road traffic noise will be that associated with delivery of materials to and from the recycling facility, staff movements, and visitors. Ground vibration can be generated from construction traffic, light vehicles on the roadway and by construction activity. It is predicted that when the recycling facility is completed, the traffic flow on the N2 will be substantially reduced by the opening of the new N2 motorway. The traffic flow increase on the existing N2 in year 2006 (with new N2 motorway open) is predicted at less than 10% of the projected 2004 N2 flow. This increase in noise levels will be insignificant at less than 0.8 dB(A) along the N2. Mitigation measures for noise impact include the construction of a 3.5m topsoil berm along the southeast boundary of the site in line with nearest residences, and to the around the processing and stockpiling areas of the C&DWRF, and the structures that will house all the main noise sources will be designed to give an overall sound transmission loss of 15 dB(A)

5.9 Landscape & Visuals

Landscape and visual impacts can arise from the proposed development in a number of ways, including the removal of landscape features (temporary or permanent), the construction impacts (short term) and operational impacts, including lighting (medium or long term). Construction

impacts are likely to have significant impacts, but by their nature will be short-lived. Construction activities will be largely screened from the south and southwest of the site by the temporary quarry workings and presence of intervening vegetation. Views from the north and northwest will be partially screened by the construction of the new N2 road and intervening vegetation.

The effect of the proposals would be to increase the footprint area and size of industrial type facilities within the Kilshane area. The nature of the development is consistent with other nearby land uses, as the presence of the quarry, power plant and associated structures; power lines and pylons already heavily influence and degrade the landscape character of the area immediately adjacent to the proposed development. The taller structures will be visible but would not significantly change views as tall existing industrial buildings to the southwest of the site are already prominent in these views. Appropriate finishes will lessen the impact of the larger buildings and structures within the landscape. The users of the existing N2 road will receive a slightly negative impact from the development following mitigation. The views from the new N2 will be greater than from the existing N2. This is because the new road will be elevated over the existing N2 in the northeast corner of the site. However as the tree and shrub planting on the embankments of the new N2 road matures, the views of the Recycling Park will be lessened.

Properties located immediately by the southeastern end of the development and which line the existing N2 road will experience the most significant effects of the development; due to their close proximity. The proposed landscape bunding and planting along the southeast boundary of the site will screen these properties from ground floor level and the growth of shrub and tree material will also further lessen the visual impact over time. Mitigation measure of visual impact of the facility include the retention of existing hedgerows and trees surrounding the edges of the site for screening, supplementary planting of local provenance plant material at the site's perimeter to reinforce the existing landscape structure

5.10 Cultural Heritage

The following are the potential impacts of the proposed development on the cultural assets and heritage:

- Archaeological deposits have been located in the area defined as a possible motte and bailey (site of) these consist of ditches, burnt area, gullies, possible pits and postholes.

- Archaeological deposits in the form of a spread of heat affected and shattered stone have been located in the area flagged as a geophysical anomaly.
- Archaeological deposits could potentially be located within the areas undisturbed by testing.

The following mitigation measures are recommended:

- No development will proceed in the vicinity of the features associated with the possible motte site
- A buffer zone will be created around the possible motte and bailey site, which measures 10m to the south and east and 20m to the north and west.
- It is recommended that if the archaeological deposits identified as a spread of heat affected and shattered stone to the north west of the site and an area of burning cannot be avoided by the proposed development, then a full record of the site will be created through archaeological resolution under licence/ direction of The Department of Environment, Heritage and Local Government.
- It is recommended that full monitoring of any groundworks outside of the recommended buffer zone area be carried out by a suitably qualified archaeologist under licence/ direction of The Department of Environment, Heritage and Local Government.

5.11 Infrastructure & Transport

It is estimated that the total site, when fully developed, will generate some 450No. vehicle movements, comprising 310No. HCV movements and 140No. car and light goods movements during the normal working day. During construction, it is estimated that the works will generate an average of 10No. HCV trips, with peaks of 20 HCV trips per day being generated during certain operations, such as the pouring of the concrete etc. It is estimated that the development will also generate approximately 20No. other car and light vehicle trips per day, this will include service vans, site visitors, journeys to work etc.

The traffic flow at the location of the proposed exit on the N2 is very high with a predicted AADT of over 30,000 in 2004. At peak times, the level of service on this section of road would

be E³. There are proposals to provide a new motorway link between the M50 and the N2 north of Ashbourne. This road is at an advanced stage of construction and is expected to open in 2006. The level of service experienced on the section of the old N2 in the opening year of the motorway at the proposed site, including the proposed facility in full operation, will be at least B³.

The construction phase of the waste facility project will, at worst, correspond with the final phase of the motorway construction. The overall increase in existing traffic in volumetric terms for the construction phase will be less than 0.5% of existing traffic level. When the new N2 Road Scheme is in operation, the main impact on traffic on the existing N2 will be from traffic entering and leaving the facility. The mitigation measures for the impact of traffic from the proposed develop include a single access point to the site, the single access is located towards the centre of the total site in order to maximise the entrance sightlines in both directions, the fence line will be set back to facilitate the provision of sightlines at the entrance to comply with the requirements of NRA Design Manual for Roads and Bridges and it is proposed to incorporate into the design a right turning lane for traffic coming from the Kilshane Cross direction together with a left slip lane for traffic entering the site from the south (M50).

6 INTERACTION OF THE FOREGOING

There is the potential for interaction/ inter-relationships between the impacts of the proposed development within and adjacent to the proposed development, as follows:

- Dust suppression and the use of a vehicle wheel wash at the C&D Waste Recycling Facility are proposed to mitigate the impact of wind blown dust around the site and to nearby dwellings. All waste handling and storage will take place within the confines each of the waste treatment buildings; therefore, there will be not external generation of dust. Road cleansing will be undertaken to minimise the impact on the road network. These measures will reduce the impact on human beings, ecology, water environment, climate and roads in the vicinity of the proposed development;
- Travel patterns will not be disrupted by the proposed facility. The new N2 Road Scheme will

³ National Roads Needs Study, National Roads Authority 1998. Level of service rating E refers to a single carriageway with an average speed of 72kph. Level of service rating B refers to a single carriageway with an average speed of 88kph.

significantly reduce the vehicle numbers on the existing N2. The proposed facility will have negligible impact on the existing N2 once the new Road Scheme is opened, when compared with existing road usage levels. Mitigation measures to improve the entrance road and possible measures to repair any damage caused by the construction traffic to the local roads in the vicinity of the site will further reduce the impact of the facility. These measures will improve road safety for all road users in the Kilshane Cross area.

- The use of road-worthy and sealed containers, tankers and refuse collection vehicles for the transport of organic material and residual waste, both to and from the Sludge Hub Centre, the Biological Waste Treatment Facility and the Waste Transfer Facility, will mitigate against odour generation during transportation. This measure will reduce the impact on human beings and the local environment.
- Odours will be reduced by ensuring that there will be no external handling or treatment of waste. All waste treatment buildings will be constructed to the highest specifications to reduce the emissions and air abatement systems will be installed to treat air and exhaust gases. These measures will reduce impacts of odour on human beings.
- Professional vermin control experts will be employed, if deemed necessary, to ensure vermin activity is minimised. All waste operations will be carried out indoors, thus the proposed facility will not be an attractant to birds.
- Compliance monitoring will be undertaken, as per regulatory conditions and will be reported on, as part of the annual environmental report for whole facility. These reports will be made available to all interested parties, which will allay public concerns as to the operation of the site and will result in a positive interaction with respect to human beings.
- The facility will be operated to Best Available Techniques (BAT) as per EPA recommendations. All information will be available to interested parties; a complaints register will be maintained. The EPA will undertake regular environmental audits, which will demonstrate how the facility is performing. These measures will result in interaction in all environmental criteria.
- The baseline assessment for this project was completed prior to the design of the facility, which allowed major impacts to be avoided. Avoidance of impacts will be used during the design of the proposed facility. The impact and mitigation measures proposed are designed to further ameliorate the impact of the waste management facility on the wider environment.

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

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SEPTEMBER 2005