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1. INTRODUCTION

This is the Non Technical Summary of an Environmental Impact Statement for a number of proposed amendments to the Indaver Ireland (referred to as Indaver henceforth) waste-to-energy facility at Carranstown, Duleek, Co. Meath. Planning permission (File Reference Number SA/600050, & PL 17.219721) was granted to Indaver Ireland in 2006 for the development of the facility. An amended permission (SA901467) relating to detailed design changes and a reduction in scale of the building was also granted in December 2009. The facility began the commissioning phase in August 2011, and has been fully operational since October 2011. The facility operates under EPA Licence W0167-02 which is also to be reviewed. The site location is shown on Figure 1.1.

The facility was designed and built to accept 200,000 tpa of waste. This was based on an expectation of the average calorific value of Irish residual municipal waste being 9.35MJ/kg. However, since commencing operations it has become apparent that the actual calorific value of Irish waste is much lower than 9.35 MJ/kg and is closer to 8 MJ/kg. This implies that the waste possibly has a higher biodegradable waste content than anticipated.

Similar to other conventional solid fuel power plants, the tonnage throughput of waste-to-energy facilities is defined by the size of the boiler (thermal capacity), the average expected CV of the waste and the number of operating hours per annum. In the Meath WTE facility, the boiler has a design capacity of 70MW. If the waste has a low calorific value, then more waste needs to be processed to achieve the same thermal output. Conversely, if waste has a higher calorific value then less waste is processed to achieve the same thermal output.

As Irish waste currently has a lower calorific value, more waste can be processed at the facility than previously expected to meet the thermal capacity of the boiler. As a result, it is now proposed to accept an additional 20,000 tpa at the Meath WTE facility bringing the total capacity to 220,000tpa.

In addition it is proposed to accept a number of suitable hazardous waste types for treatment in the Meath WTE facility. Most of these are already present in the MSW waste being currently accepted on site, (e.g. paint tins, rags and wipes contaminated with paints or oils), and are treated without difficulty.

The proposed amendments sought by this application in terms of the additional waste types and additional capacity do not result in any significant changes to the nature of the process or waste handling procedures (with the exception of one waste types if granted). The other proposed changes (conversion to permanent status of structures, car parking) require only minor construction works.



Figure 1 Existing Facility (March 2012)

A synopsis of the amendments proposed is presented in Section 1.1 below. The footprint of the facility is approximately 10 hectares (25 acres), located in a general agricultural area between Duleek and Drogheda next to a cement factory and quarry north of the site.

Proposed Amendments

The amendments to the facility are summarised as follows:

- 20,000 tonnes (10%) increase in annual throughput
- Inclusion of additional EWC Codes (hazardous and non hazardous)
- Amendment of waste acceptance hours:

Current	Proposed	Period
08:00 – 18:30	06:00 – 20:00	Mon - Fri
08:00 – 14:00	06:00 – 14:00	Sat

- Unrestricted hours for the dispatch of residues from site
- Future additional capacity ammonia storage tank and fuel oil tank
- Convert hardcore area for contractor parking during construction to permanent status
- Conversion from temporary to permanent status of two structures:
 - Spare Parts Warehouse & associated electrical switchgear building with hard core surround.
 - Single storey modular office block & associated electrical switchgear building and to include:
 - Effluent treatment plant

- Paved roadway (with hard cored area to each side) leading to office block
- 22 additional paved car parking spaces added to existing car park

Company Profile

In 1999 Indaver NV acquired 60% of MinChem Environmental Services Limited, a hazardous waste management company operating in Ireland since 1977. In 2003 Indaver NV acquired the remaining 40% of MinChem and in 2004 changed the name of the company to Indaver Ireland Limited. Today, Indaver Ireland Limited, with offices in Carranstown, Dun Laoghaire, Dublin Port and Cork, employs approximately 125 people and is the company that operates the Meath WTE Facility.

Indaver Ireland Limited are a registered Waste Broker (IRE/AG040/12), and also operate an EPA Licenced (W36-02) Waste Transfer Station and Solvent Recovery facility in Dublin Port. In 2010, Indaver Ireland Limited managed approximately 65,000 tonnes of hazardous waste for its customer base, and exported the majority of this amount to other Indaver Group facilities or external treatment centers.

Indaver Ireland

Indaver Ireland, a wholly owned subsidiary of Indaver NV, was established in 1999 to develop waste infrastructure in Ireland. The branch developed and built the Meath WTE facility and then transferred this to Indaver Ireland Limited to operate. The branch is also trying to develop and build an Industrial waste facility, which includes a hazardous waste incinerator, in Ringaskiddy, County Cork. Information on Indaver's projects can be found on the website www.indaver.ie.

Indaver NV Company Profile

Indaver NV, is the Flemish parent company of Indaver Ireland and Indaver Ireland Limited. Indaver is a waste management company that specialises in integrated waste management for industries and households. Indaver recycles, treats and disposes of both domestic and industrial waste. Advice on the prevention of waste is an integral part of the Indaver service.

The Dutch multi utility company, Delta is the majority shareholder of Indaver NV with a 75% shareholding. Flemish Environmental Holding is the holding company of the Government of Flanders and it has a 16% stake in Indaver NV. The remaining shares are held by a number of leading private companies in Flanders. The Indaver group plays a leading role in the implementation of the Flemish Government Waste Policy. The company employs over 800 people and has operations in six European countries. In 2010, Indaver offered a solution for the management of around 4.3 million tonnes of waste in its own processing installations as well as in external centres.

Indaver's Activities

Indaver NV is involved in a comprehensive range of waste management activities at its various facilities in Flanders, and elsewhere in Europe. More detail can be obtained from the Indaver Group Sustainability Report 2010 on www.indaver.ie, (Sustainability)

All the company's facilities are licensed by the regulatory authorities in the region in which they operate. Indaver is striving to have all its facilities accredited to the ISO 9002 Quality Assurance System, the ISO 14001 Environmental Management System and the OHSAS 18001 Health and Safety Standard. Indaver NV was the first waste management company in Flanders (and among the first in Europe), to attain accreditation to the ISO 14001. These certifications are independently audited on a regular basis to ensure company compliance.

An integral part of the above certifications is clear and regular communications with members of the public, customers, suppliers and regulatory authorities. Indaver is committed to permanent and open dialogue regarding environmental matters.

Pre-Planning Communications Programme

Indaver Ireland believes in a policy of openness and dialogue between the company and the local community. Indaver has undertaken a consultation campaign on the proposed amendments to the existing facility.

Further details outlining the principle changes to the waste-to-energy facility are available on the Indaver website www.indaver.ie Indaver will make themselves available to meet up with any parties throughout the planning process.

On-going Communications Programme

Indaver Ireland believes in a policy of openness and dialogue between the company and the local community. This openness and dialogue has started and Indaver Ireland will maintain this policy of openness throughout the construction phase and the lifetime of the facility. Through Indaver Ireland's website (www.indaver.ie) interested parties can register with Indaver Ireland to obtain regular updates on further developments of the project.

2. BACKGROUND TO THE PROJECT

Need for the Scheme

The need for the existing facility with 200,000 tpa capacity was established in the planning permission PL17.219721 granted for the facility in October 2007 and again in planning permission SA/901467 granted in December 2009. The reasons and considerations given in the final permission referred to:

- the national waste management policy framework and strategy as set out in Government Policy Statement Taking Stock and Moving Forward (2004)
- the National Development Plan (2007-2013) provisions in regard to waste management
- the National Strategies on Biodegradable Waste (2006) and Climate Change (2007-2012)
- the Waste Management Strategy for the North-East region as set out in the current North-East Regional Waste Management Plan (2007).

There has been no change in policy. The only changes in legislation have reinforced the position of waste-to-energy in priority over disposal options, including landfill.

In the EIS submitted in 2009, the position of waste-to-energy in the waste hierarchy ahead of landfill disposal was due to be updated in the national policy framework. While national legislation has been adopted that cements this position in line with the Waste Framework Directive, an update in national waste policy is still pending. Overall, there have been some key legislative developments but no changes yet to waste and energy policies and plans since the 2009 planning decision.

Site Selection

An assessment of alternative locations for the proposed facility was undertaken as part of the EIS prepared in 2006. The assessment comprised the consideration of a number of site selection criteria, both environmental and technical to determine whether the application site or a number of alternative sites were suitable sites for the development of the proposed facility.

For the purposes of this application it is considered, given the existing planning permission for the proposed development, that the site location is established. In 2006 it was submitted that the subject site was a suitable location to operate a waste to energy facility and was the best available site to Indaver. In granting planning permission both Meath County Council (in 2006) and the Board (in 2007) obviously agreed with the concept of waste to energy and that the chosen site was a suitable location to operate such a facility.

The increase in tonnage throughput of 20,000 tpa would be too small for a standalone facility on a new site. Co-Location with the only available existing facility for thermal treatment is the most sensible choice. The other proposed changes are site or facility specific and cannot be carried out elsewhere. The alternatives are considered in more detail in Section 3.

3. ALTERNATIVES

As part of the Environmental Impact Assessment (EIA) process alternatives are typically considered on the following levels;

- Alternative Locations
- Alternative Thermal Treatment Technologies
- Alternative Waste Management Strategies
- Alternative Energy Recovery and Gas Cleaning Systems
- Alternative Designs

Alternative Locations

For the purposes of this application, given the existing planning permission for the development, the suitability of the site location for a WTE Facility is established and unchanged from the final permission granted in October 2007.

The suitability of the site for the additional 20,000 tonnes per annum proposed (including the additional traffic movements) has been assessed as has the location of the Proposed Centralised Maintenance Facility, Modular Office Block and ancillary services.

Alternative Thermal Treatment Technologies

The Facility now operates with a moving grate furnace with a two stage flue gas cleaning system and energy recovery. The extra capacity proposed will comprise MSW and hazardous waste, but the exact split between the two waste types over the 20,000 tonnes will be driven by market factors and the availability of certain waste types should planning permission be granted.

Alternative Waste Management Strategies

The Meath WTE Facility is still in line with current National, Regional and European Policies. Indeed its existence makes the North East Region the only region in Ireland with a complete integrated waste management system in place.

Alternative Designs

This application includes the conversion of two existing temporary structures on site to permanent structures. These are the proposed Modular Office Block and the Centralised Maintenance Depot. The main consideration given was to effect the conversion of these structures in the least intrusive manner possible. The structures are in situ as part of the construction of the facility, and it was felt that making no changes to the appearance or lay-out would allow for the very minimum of construction activities, raw material usage, and general disruption to the operations on site.

4. PLANNING & POLICY

Since the previous planning permission was granted in November 2009, there have been relatively few changes to the Irish waste and energy policy environment. Existing policy continues to favour landfill diversion, promote the waste hierarchy and support the development of waste-to-energy capacity.

The key European Strategies and Directives relating to municipal waste, the Waste Framework Directive (2008/98/EC) and the Landfill Directive (1999/31/EC), remain unchanged. On a domestic level, these Directives have recently been implemented as well as the Renewable Energy Directive 2009/28/EC and *European Communities (Renewable Energy) Regulations 2011*.

Overall, any recent changes in waste policy or legislation have served to strengthen the position of waste-to-energy as an alternative to landfill for residual waste. Therefore, the proposed additional 20,000tpa capacity aligns with current policy in terms of being a suitable preferred treatment type for residual waste.

5. SITE AND SCHEME DESCRIPTION

Indaver Ireland Ltd. intend to apply for amendments to the existing permission PL17.219721 and SA/901467 granted for the Meath WTE Facility which began operating on the site in October 2011, after the completion of a three year construction phase.

Proposed Amendments

The proposed amendments do not entail a significant change in the processes or activities currently in place. The proposed amendments primarily relate to a 10% increase in the volume of waste processed annually by the facility and acceptance of a number of additional suitable hazardous waste types. The amendments are as follows;

- 20,000 tonnes (10%) increase in annual throughput
- Inclusion of additional EWC Codes (hazardous and non hazardous)
- Amendment of waste acceptance hours:

Current	Proposed	Period
08:00 – 18:30	06:00 – 20:00	Mon - Fri
08:00 – 14:00	06:00 – 14:00	Sat

- Unrestricted hours for the dispatch of residues from site
- Future additional capacity ammonia storage tank and fuel oil tank
- Convert hardcore area for contractor parking during construction to permanent status
- Conversion from temporary to permanent status of two structures:
 - Spare Parts Warehouse & associated electrical switchgear building with hard core surround.

- Single storey modular office block & associated electrical switchgear building and to include:
 - Effluent treatment plant
 - Paved roadway (with hard cored area to each side) leading to office block
 - 22 additional paved car parking spaces added to existing car park

Waste Acceptance Procedures

In order to ensure wastes are suitable for acceptance to the facility all possible feed streams were assessed before it's suitability for the Meath WTE was determined. Liquid wastes (hazardous & non-hazardous) will be sampled and analysed to ensure that the composition is well known and is suitable for treatment.

A complete screening of any proposed waste streams will be completed, to ensure that the waste streams will;

- Have a known calorific value range
- Have a known flashpoint range > 55°C
- Not contain elevated levels of PCBs, Halogens, heavy metals or radioactive material.
- Comply with the requirements of IED (Industrial Emissions Directive 2010/75 EU); Art. 45.2 (a) and Art. 52.3

Indaver Irelands Technical Team (part of the Quality, Environmental, Safety & Health (QESH) Dept) is responsible for waste classification. All waste types will be classified by the Technical Team of Indaver Ireland Limited, to comply with the very strict transport regulations of ADR & IMDG, EC1013/2006, as well to ensure they meet the acceptance criteria of the Waste Outlet to which they are being sent. This is in accordance with Indaver Ireland Procedure [Operations 4.2](#) "Classification and Identification of waste". A copy of this procedure is provided with the application.

It is foreseen that only minor adjustments will have to be made to the existing Waste Acceptance Procedure (Env 01.00) and Waste Handling Procedure ([ENV 02.00](#)) to reflect the proposed additional waste codes, as the wastes will still ultimately be tipped into the waste bunker and fed to the furnace using the grab cranes.

Wastes carrying a hazardous EWC code will be tipped into the bunker directly from the reception hall and hence no extra handling procedures are proposed for the acceptance of such solid wastes. Liquid wastes with non-hazardous EWC codes are currently permitted to discharge directly into the furnace. Extra precautions may also have to be taken for inspecting waste loads, but this will relate mainly to additional PPE requirements for the operators.

The only exception to this would be if infectious waste (EWC Code 180103*) was to be accepted at the plant and in this case a direct feeding method of this waste to the furnace would have to be provided. This is a requirement of the BAT Guidelines (Section 5.6) and the Industrial Emissions Directive (Article 50.6) which state that infectious clinical waste must be placed straight into the furnace without being mixed and without direct handling. Prior to acceptance of any infectious clinical waste, the Meath WTE will ensure full compliance with these criteria.

Process Changes

The incineration process and associated flue gas cleaning and energy recovery systems are unchanged from that outlined in the EIS of 2009. A schematic of the process is shown below in Figure 2

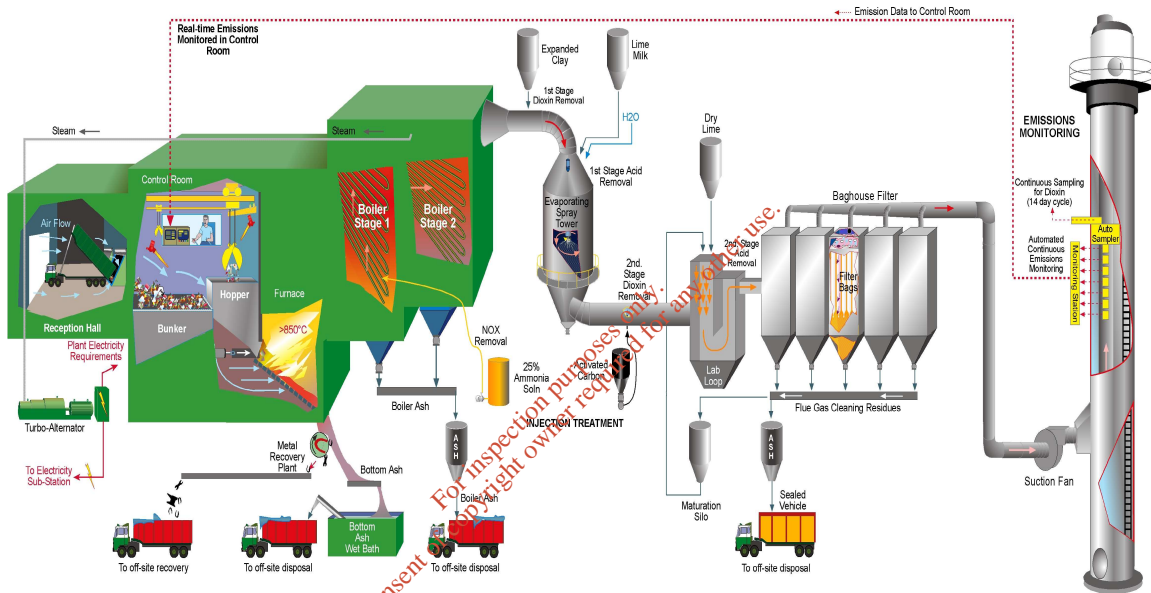


Figure 2 Process Schematic

As outlined previously the proposed amendments to the facility require no significant amendments to the process or plant used including moving grate incineration system, De NOx system, waste boiler, steam/turbine generator, flue gas cleaning or induced draft fan systems. Some additional raw materials will be required.

No changes are required at the ash handling stage. A conservative 10% increase in residue production is assumed in order to ensure that a robust assessment of changes to traffic flows to and from the site is done.

Description of Secondary Activities

- As outlined above there will be a small increase in traffic to take waste residues off site. The upgrade of the R152 road outside the plant has been completed to the satisfaction of Meath Co Co as required under permission PL.17.219721.

- The proposed amendments will involve no change to the manner in which on-site traffic is managed.
- The waste-to-energy plant exports electricity to the local electrical distribution system via a 38 kV line to Rathmullan Substation about 2.5km north of the site. The line is installed as an underground cable and hence does not have any visual impact.
- The development uses a small quantity of mains water as a potable supply for the facility. On site water well(s) were installed at the site in June 2011. These are used to supply process water within the facility.
- Domestic sewage from toilets, changing and kitchen areas discharge via the foul drainage system into the on site effluent treatment system which pass through a percolation area to ground. There are currently two such percolation areas, one for the main process building facilities and one for the gatehouse. An additional effluent system is proposed for the modular office block building.
- A telecommunications network is in place to the main process building and to all areas of the site where telemetry or remote monitoring is required. All cables are underground and ducted. The proposed amendments do not entail any changes to the existing network.
- It is not anticipated that any additional environmental monitoring will be required as a result of the proposed changes. The review of the existing waste licence with the EPA will identify any such requirements.
- The proposed amendments do not entail any change to Site Security procedures. All traffic (both vehicular and pedestrian) to the main site must route through the Gatehouse. This is manned by Security Personnel who ensure the procedure for access to site are followed.

Stack Emissions

In the 2006 EIS and subsequently in the 2009 EIS Amendment application, the emissions from the plant were assessed based on the maximum allowable limits in the Waste Incineration Directive (which will be replaced by the Industrial Emissions Directive 2010/75/EU) and 110% of the estimated flue gas flow rate at the plant nominal capacity. Recent measurements of the short term average nominal flue gas flowrate and the fact that the actual emissions from the plant are well below the limits modeled, demonstrating that the existing assessment of the impact on air quality is robust. A summary of current measured emission values have been presented in the EIS.

Staffing

Currently, there are 20 shift workers who work in teams of 4 to run and control the plant on a 24 hour basis. There are another 22 employees split between the following functions:

- Management and Administration
- Operations
- Quality Control and Assessment
- Maintenance

Other persons who may be on site intermittently would include:

- Visiting Staff from other Indaver Sites (both in Ireland and Europe)
- Contractors employed for servicing or repairs
- Educational visits/Site Inspections from a broad range of companies and institutions.

The proposed establishment of a Centralised Maintenance Department in one of the structures will result in an increase of staffing levels by 2-3 persons.

Regulatory Control

In order to operate the waste management facility, Indaver require a licence from the EPA. Indaver currently have a waste licence (ref. W0167-02), and this EIS has also been prepared for a licence review application to the EPA to increase the annual tonnage and to add the new waste types proposed.

Description of Decommissioning

A detailed Closure, Residuals and Aftercare Management Plan (CRAMP) and Environmental Liabilities Risk Assessment (ELRA) have been prepared and submitted to the EPA as part of compliance with Condition 10 of the Waste Licence.

Health and Safety

The facility has been built in accordance with the Safety Health and Welfare at Work Act, 2005, Health, Safety and Welfare at Work (General Application) Regulations, S.I. No. 299 of 2007 and associated Regulations. No changes are proposed to the systems and general approach to operational safety.

Indaver operates a combined Quality, Environmental, Safety & Health (QESH) Management System. It is proposed to apply all of the internationally recognised quality, environmental and health and safety standards/assessment series of our existing hazardous waste business (which operates to ISO 9001:2000, ISO 14001 and OHSAS 18001) to the Meath Facility also.

The site is not a Seveso site. During the course of the previous applications, the HSA has assessed the site and formed the view that Regulations of SI No. 74 of 2006 do not apply.. The proposed amendments will not result in any change in status.

6. HUMAN BEINGS

The human beings assessment has been conducted by: reviewing world policy and research papers on the impact of waste-to-energy facilities on human health; baseline monitoring of dioxins and predicting any possible impact from the facility: completion of an odour assessment; and reviewing the current and future socio-economic status of the area.

Health

As part of the 2006 EIS, Dr. Martin Hogan AFOM, FFOMI, a Medical Doctor specialising in Occupational Medicine was asked to assess the potential effect on human health of the Municipal Waste Incinerator at Carranstown Co Meath. It is considered that the proposed amendments, which do not result in a change to the primary process or the nature or characteristics of the emissions, will not result in an impact on human health. This is demonstrated in the findings of the air quality study (as presented in Chapter 7). It was therefore not considered necessary to reassess the potential impacts of the facility on human health. The potential health impacts regarding the delivery, handling and processing of the proposed new types and additional waste tonnages has been assessed.

Social Activities

The current socio economic status in the areas close to the development was reviewed. In the case of Indaver Ireland this is the District Electoral Division (DED) of Duleek in Co. Meath.

Identification of principal potential receptors and an analysis of recent trends in population, employment economic performance and land use including local amenities was completed and the impact of the development was assessed against this background. Reference is made to the most recent census data available from the Central Statistics Office (CSO), 'Census of Population 2006, Small Area Population Statistics'. Although the 2011 census has been completed the Small Area Population Statistics will not be available from the CSO until later during 2012. The only statistics available at the time of publication of from the 2011 census is the population for the state and province.

Residential development in Carranstown is predominantly ribbon development along the main roads. These vary from one off housing to garages and two-storey farmhouses with associated sheds (see Figure 3). The closest population centres are Duleek village to the south west and Drogheda town to the north east.

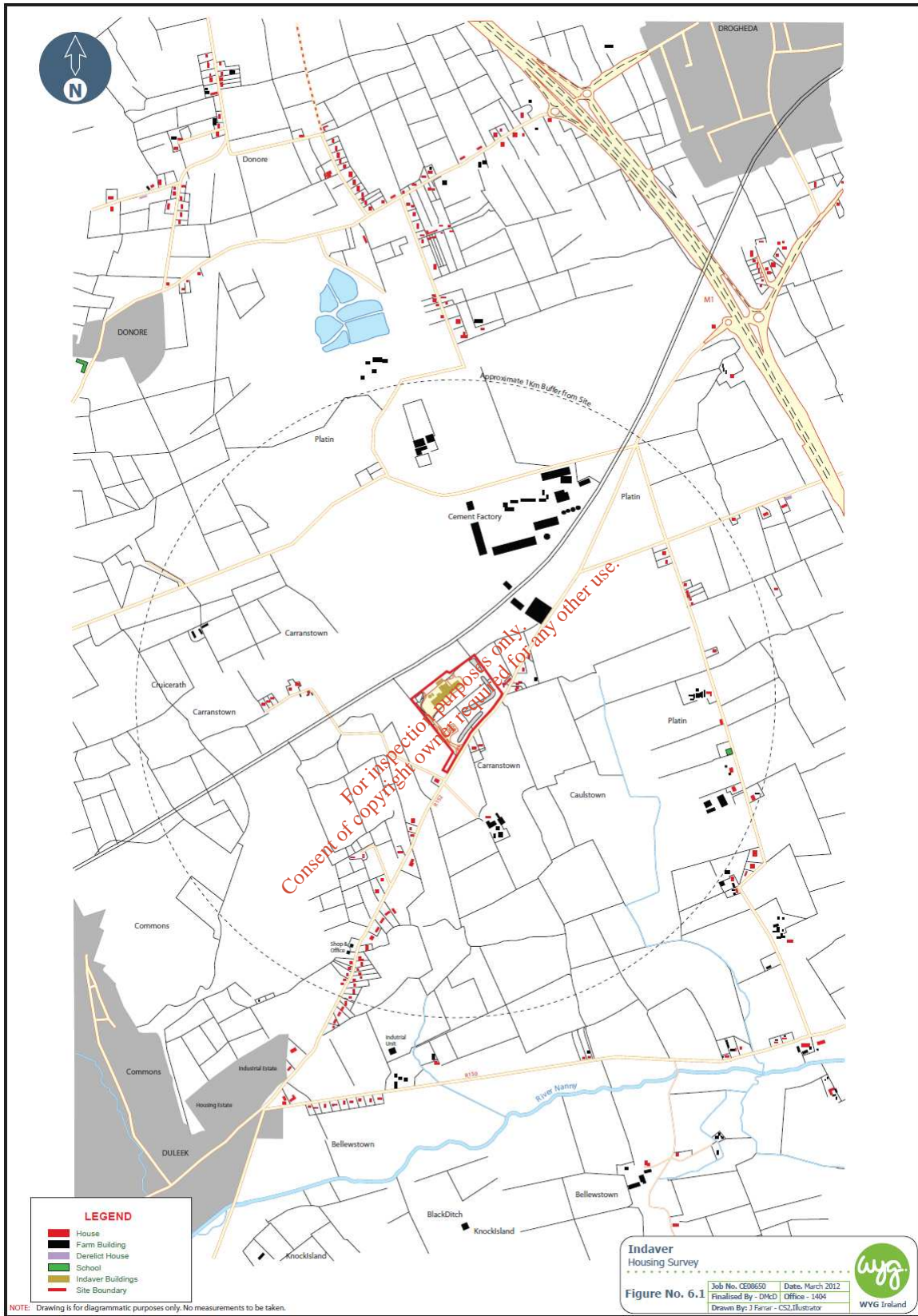


Figure 3. Housing Survey November 2011

Tourism

Many European municipal waste-to-energy facilities are located in the vicinity of major tourist attractions. Incinerators are currently operating in European cities such as Paris, Monaco, Vienna and Lisbon and on islands such as Madeira and Majorca, all popular holiday destinations and where tourism makes a significant contribution to the national economy. From research to date there is no evidence to suggest that a waste-to-energy plant has a significant impact on tourism in its vicinity.



Waste-to-energy facility on Island of Madeira

Economic Activity

It is expected that during construction works related to the proposed amendments a small number of additional staff will be required. The staff will comprise managerial, technical, skilled and unskilled workers.

Currently the facility employs 44 personnel in a full time capacity (the majority of whom are from the immediate area). Based on the proposed amendments the employment will increase to 46-47. It is considered that the revenue generated from the additional employment of 2-3 persons within the study area will result in additional money being spent in the locality. This will have effects on local service demand, accommodation etc over a long term basis resulting in continued expenditure within the locality.

Community Gain

As a condition of the original planning permission granted to Indaver Ireland an annual financial contribution of €200,000 is made to Meath County Council for the provision of environmental improvement and recreational/community facility projects in the vicinity of the facility. The identification of environmental/recreational/community facility projects are decided by Meath County Council and the Community Liaison Committee.

The additional tonnage proposed will provide an additional €25,000 per annum to the fund if granted.

Social Considerations

Ireland continues to have an urgent need of alternatives to Landfill due to pressures from the EU and Irish legislation. While waste to energy is not the *definitive* solution to the waste issue in this country, its necessity is paramount to the success of sustainable integrated waste management system in

Ireland. While the facility will be an end of cycle process for waste, the re-use of the waste as energy is in line with the principles of the waste hierarchy and sustainable development. Impacts upon society as a result of this development have been considered in detail in the individual subsections of the EIS.

Landuse

The proposed amendments entail no changes to the footprint of the facility. There will be no loss of rights of ways, amenities or rezoning of land required. The operation of the development is not predicted to have any significant impact on the land-use of the surrounding areas and is not predicted to have any significant impact on the housing in the surrounding areas.

7. AIR

The air quality assessment undertaken in 2009 comprehensively addressed the potential impacts of the emissions from the existing development on the air quality of the site and its environs. In order to account for the proposed amendments, the 2009 study has been updated to allow for an increase in traffic associated with the proposed increase in waste accepted from 200,000 tonnes to a maximum of 220,000 tonnes (including a possible maximum of between 10,000 – 15,000 TPA of suitable hazardous waste streams).

The 2009 assessment was modelled on the maximum emission concentrations outlined in the Waste Incineration Directive (2000/76/EC), and assumed 110% of the nominal flue gas flow rate and also assumed 100% availability of the plant of 8760 hours per year. This found that the impact on air quality would not be significant. As outlined in Chapter 5 of the EIS, the additional tonnage proposed and new waste types will not alter these conditions and as such this has been fully addressed by the 2009 assessment. In conclusion, the type of waste being incinerated is not wholly relevant as the emission limits in the Directive must be observed. Hence, this assessment is focused primarily on any impact associated with the additional truck movements to the site.

In 2009, Air dispersion modelling was carried out using the United States Environmental Protection Agency's (USEPA) regulatory model AERMOD. The aim of the study was to assess the impact in the ambient environment of emissions from the facility at the maximum emission limits outlined in Council Directive 2000/76/EC and also at a maximum stack emission flowrate. Modelling was also conducted under abnormal operating conditions to assess any short-term impact due to these infrequent events and also under expected or average operating conditions. The study demonstrates that all substances which will be emitted from the facility will be at levels that are well below even the most stringent ambient air quality standards and guidelines.

Methodology

The assessment methodology involved air dispersion modelling using the UK DMRB Screening Model⁽⁹⁾ (Version 1.03c, July 2007) and the NO_x to NO₂ Conversion Spreadsheet⁽¹⁰⁾ and following guidance issued by the NRA⁽¹¹⁾, UK DEFRA⁽⁶⁻⁹⁾ and the EPA^(12,13).

Construction

The construction activities associated with this development will be minor and temporary in nature. Dust emissions associated with the construction phase of the project will be negligible

Incineration

The effect of the changes to the process operation on air quality will not be significant.

Traffic Impact

Modelling results for PM₁₀, PM_{2.5} and NO₂ based on typical speeds indicated that though pollutant levels associated with additional traffic movements are increased at worst-case traffic speeds, pollutant levels are still significantly below the relevant limit values for PM₁₀, NO₂, and PM_{2.5}.

There will be no significant impact on air quality due to construction operation or changes to road traffic as a result of the proposed amendments.

8. NOISE

An assessment was conducted of the impact of the anticipated noise and vibration associated with the development at nearby sensitive locations on human health and the environment. The noise sources associated with the proposed amendments are identical to those originally assessed in the application of 2009. In terms of the current application the main potential for a change in the previously assessed noise impact relates to additional traffic on the local road network.

The methodology adopted for this noise and vibration assessment is as follows:

- Characterisation of the receiving environment;
- Characterisation of the proposed development;
- Prediction of the noise and vibration impact associated with the proposed development;
- Evaluation of noise and vibration impacts.

As part of on-going works, two continuous noise monitors have been maintained on the site for the duration of the construction phase. The data obtained from these units prior to the commencement of construction activities and during a period when the site was commissioned and through the testing process has been reviewed. It is considered that this data presents a robust picture of the actual noise impact of the operational facility.

During the construction phase of the project there will be some impact on nearby noise sensitive properties due to noise emissions from site traffic and other activities. However, given that the construction phase of the development is minor and temporary in nature and the distances between the main construction works and nearby noise sensitive properties, it is expected that the various noise sources will not be excessively intrusive.

Operationally, the increase in traffic noise levels along the adjoining road network will be less than 3dB(A) in all instances. It is expected that that activities on site will be controlled so as not to exceed typical EPA Waste Licence daytime and night-time criteria of 55dB and 45dB L_{Aeq} respectively at the façade of nearby residential properties.

The resultant noise impact from the proposed amendments to the development on the local community are therefore not deemed to be significant.

9. GEOLOGY AND SOILS

An assessment of the impact of the proposed development on soils and geology has been prepared based upon information from previous assessments of the site, the most recent of which was completed as part of an EIS and planning application submitted in 2009. A full assessment including intrusive investigations was undertaken at the site in 2005 which addressed the primary impacts potentially affecting the soils and geology aspect.

The soils beneath the site consist predominantly of brown silty clays generically known as boulder clays. These consist of medium dense brown silty clays with pebbles, cobbles and occasional boulders. The boulder clay varies in thickness across the site, ranging from four metres towards the west of the site, to greater than 10 metres towards the centre. The boulder clay is underlain by the Platin limestones. The Platin limestones display karst features in and around the nearby Platin quarry.

Baseline Assessment

As part of the site investigation completed prior to development, representative soil samples were collected from a number of trial pits across the site. Samples were analysed for priority pollutants including Volatile Organic Compounds, Polycyclic Aromatic Hydrocarbons (PAHs), Metals, Total phenols, Pesticides and Polychlorinated Biphenyls (PCBs). The results of this investigation showed that there is no significant soil contamination at the site. However some traces of metal contaminants were identified. The levels identified would commonly reflect agricultural activity within the area.

A test was conducted in December 2000 to assess the suitability of the site for the installation of a Puraflo™ system. In addition PM group in February 2009 conducted additional percolation tests. The

test results indicated that while the site percolation test results were unsuitable for a traditional percolation area an engineered percolation area could be constructed to comply with national guidelines. Two engineered percolation areas are in use for the security gatehouse and the main process building facilities. A third Puraflo system and percolation area is proposed for the modular office block. It will be designed and constructed in accordance with the recently published EPA guidance on the Authorisation of Discharges to Groundwater.

Construction Phase

Relative to the scale of the construction project completed at the site for the main facility in 2010/2011, the proposed amendments will entail minor construction work. Only very shallow and limited excavation works are required and as such any minor amounts of spoil or spoil found unsuitable for reuse on site will be transported off site to a licensed facility.

Potential impacts during the construction phase of the development would be associated with accidental spillage of potentially polluting substances including oils, paints and liquid wastes and other substances associated with the construction and operational activities.

Operational Phase

The potential impacts during the operational phase would be limited to accidental spillage of potentially polluting substances including oils, paints, liquid wastes, or raw materials such as lime or ammonia or impact from discharge of sewage to ground. With good management practices in place it is expected that the development will not cause any impact on the soils and geology of the site.

Potential vibration issues relating to blasting at Platin have been assessed. Upon consideration of vibration data it is concluded that blasting will not result in cosmetic or structural damage to any of the Indaver buildings.

Mitigation Measures

Construction works will be completed in accordance with the principles of CIRIA "Environmental good practice on site" (C692) and the Environmental Management Plan for the site.

All oils, chemicals, paints, fuels or other potentially polluting substances used during construction will be stored in designated storage areas which will be bunded to a volume of 110% capacity of the largest tank/container within the bunded area(s). It is anticipated that existing site storage infrastructure can be used to minimise risks during the construction period.

Filling and draw-off points will be fully located within the bunded area(s). Drainage for the bunded area(s) will be diverted for collection and safe disposal.

All domestic effluent generated on site during construction will be managed through the existing site foul water treatment infrastructure.

The implementation of good construction management practices will minimise the risk of pollution to geology and soils.

Therefore the facility, during construction and operation, will not have a negative impact on the soils or geology of the site.

10. GROUNDWATER AND HYDROGEOLOGY

An assessment of the hydrogeological environment of the site was completed based on assessments of the site in 2000 and 2001, geotechnical reports based on assessments completed in 2007 and 2008, borehole installation completed in 2011, a desk study and information from the Geological Survey of Ireland database.

The chapter assesses the impact of proposed amendments to the existing planning permission on the groundwater of the site and environs. The only significant changes with respect to potential impact on groundwater is the installation of an additional domestic effluent treatment system to serve the new office block. Minor construction works will also be required for hardstanding and parking associated with the new buildings. New legislative standards for groundwater quality (SI 9 of 2010) have been considered in determining the impact on the environment.

Baseline Assessment

The development site is underlain by a thick deposit of low permeability brown silty clays. The vulnerability of the site has been classified by the Geological Survey of Ireland (GSI) as Moderate. The Platin Formation which underlies the site has been classified by the GSI as; *regionally important, diffuse karst aquifer, with good development potential (Rkd)*. This classification was determined by the GSI in 2004. This regionally important aquifer displays both karst and fracture flow features.

The development site lies within the groundwater regime now established by the Platin dewatering programme. The quarry abstracts sufficient groundwater to maintain the water table just below the working quarry floor. This operation has resulted in a cone of depression in the water table therefore groundwater flow beneath the development site is now determined by the cone of depression centered on the Platin excavation.

Construction

Though only minor construction works are proposed, potential impacts during the construction phase would be associated with accidental spillage of potentially polluting substances including oils, paints and

liquid wastes and any additional substances associated with the construction activities.

Waste water generated during the construction phase will be managed through the existing foul water treatment systems.

Operation

The main potential impacts during the operational phase will include;

- Impact on Groundwater Levels
- Impact on Regional Groundwater quality

Groundwater flow beneath the site is determined by a cone of depression centred on Platin Excavation. Prior to the quarry development, the groundwater flow beneath the development site would have been towards the River Nanny and in a general South Easterly direction. Current water levels are well below the level of any excavations for the development.

Mitigation Measures Construction

All potentially polluting chemicals will be securely stored during the construction phase and refueling of earth moving machinery will be carried out in accordance with a method statement. All domestic effluent will be removed for appropriate disposal at an approved waste water treatment plant.

Mitigation Measures Operation

There are no additional mitigation measures/monitoring requirements as a result of the proposed amendments.

The storm water attenuation pond has been constructed with a sealing membrane of commonly used for forming secondary containment liners in effluent tanks. The pond will be tested in accordance with facility licence conditions. The tank is approximately 2.6m deep and surrounded by a 2.4m high chainlink fence. A minimum permanent water level of approximately 300mm will be maintained in the tank at all times. A minimum freeboard of 300mm will be maintained for any storm occurrence less than 1:100 years.

All domestic effluent will be treated by an appropriate system prior to its discharge to the percolation area.

All underground piping will be maintained and regularly inspected for integrity.

A petrol interceptor is in place on the surface water drainage outfall line from hardstanding areas to contain any leakages from vehicles on site. Full details of the proposed on site drainage network are presented in Section 11.

It was concluded that the amendments to the facility will not have a significant impact on the hydrogeology of the development site or beneath the surrounding lands.

11. SURFACE WATER

As part of the 2006 and 2009 EIS', assessments of the surface water environment of the site were completed and submitted with the planning application. A revised assessment has been completed for this EIS which supplements the previous assessment with updated information where available. The amendments entail some additional construction in the form of conversion of two temporary office and maintenance structures respectively to permanent structures, the installation of an additional foul water treatment plant system and associated hardstanding surfaces and parking.

Surface water on and in the vicinity of the site drains, through land drains and ditches, towards the local stream that flows to the River Nanny. The drainage ditches are mostly dry in the summer months.

Construction Phase

Storm water management during the required construction works will be controlled in accordance with the site Environmental Management Plan (currently being agreed with the Agency) and any planning conditions set down by the planning authority. The facility (ref W0167-02) licence provides for monitoring of such issues as dust generation, noise generation, traffic management and surface water run-off.

Run off generated during construction will be directed to the existing surface water drainage system (including interceptors, attenuation pond, monitoring stations etc) prior to its discharge to the local drainage network.

Operation Phase

The site storm water drainage system has been designed in general accordance with Sustainable Drainage Systems (SuDS) principles and will collect rainwater from all roofs, hardstands, roads and grassed areas which fall naturally towards these areas. This area will amount to approximately 6.8Ha. The proposed amendments will entail some alteration to the existing drainage system but in the main the existing infrastructure will remain. There will be no need for any additional stormwater attenuation capacity. The existing design has been agreed and is in accordance with the requirements of Meath County Council.

Attenuation for a 1 in 30 year storm has been provided by means of an attenuation pond which discharges via a pump to an external drainage ditch. Attenuation of 1 in 100 year storms will also be contained with the attenuation pond. In the event of a greater than 1:100 year storm occurrence, the paving at the facility has been designed to slope away from the building meaning any flooding that may occur will flow away from the building towards the drainage system and land drains. The design will

prevent downstream flooding due to "flash flooding" from the site and will serve to add water to the ditch system in a similar manner as currently exists under agricultural usage.

The drainage design allows for the monitoring of the storm water discharge at two locations in order to prevent any uncontrolled water discharges from oil leakages, spillages etc entering the watercourses.

Domestic effluent will be treated by a Puraflo treatment system and discharged to the percolation area. There are currently two such systems on site serving the main process building and gatehouse. It is proposed to install a new system for the modular office block.

Raw materials or other potentially polluting substances (with the exception of fuel and ammonia storage) will be stored in containers/silos within the main process/warehouse building. Residues will be stored in a hall or silos within the main process building.

Fire suppression is provided by an on site dual purpose water storage tank. This tank has an overall capacity of 2,185m³ with an effective fire-fighting storage volume of 1855m³ and a process water storage capacity of 330m³. The fire fighting effort is supported by 2 diesel fire pumps connected to a fire main and hydrant system throughout both the site and buildings. This will be further augmented by Local Fire Service capabilities. In the event of a fire, the process water requirement will not be needed and potentially all 2,185m³ will be available for fire fighting. All staff are trained in Emergency Response techniques in order to deal with emergencies including fire fighting.

The greatest potential for fire at the facility arises within the waste bunker where localised heating can occur due to decomposition of organic material. Localised fires within the waste bunker are lifted using the grab crane, into the hoppers which transfer the waste directly to the furnace. Up to the level of the tipping hall, the bunker has a capacity of 5,670m³ approximately. If a 50% voidage ratio is assumed for the waste, then there would be a retention capacity of 2,835m³ within the waste bunker. With 2,185m³ of water available for fire fighting, this demonstrates that all of the water will be retained within the bunker even in the most extreme fire event.

If a fire occurred in the turbine area, the fire fighting water would be collected in the cellar beneath the turbine which has a capacity of circa 1,000 m³. The waste bunker has been designed conservatively with 1.1m thick walls and 800mm base and secondary containment system. It will therefore retain any fire water generated within the bunker.

With respect to fire occurring elsewhere in the process building or other buildings on site, the design philosophy as outlined in the 2009 EIS remains unchanged.

The firewater retention tank volume of 300m³ remains unchanged and has been calculated using the German LÖRÜRL Methodology for the calculation of retention volume.

A Fire Water Risk Management Programme was prepared in July 2011 to comply with Condition 3.7 of Indaver's Waste Licence W 0167-02.

A schematic of the effluent streams and their management is presented in Figure 4.

The existing surface water management system is adequately designed to prevent uncontrolled discharges to the outfall ditch by the provision of two layers of monitoring and a controlled discharge system. As a result of the proposed amendments there will be no significant negative impacts on the existing surface water environment.

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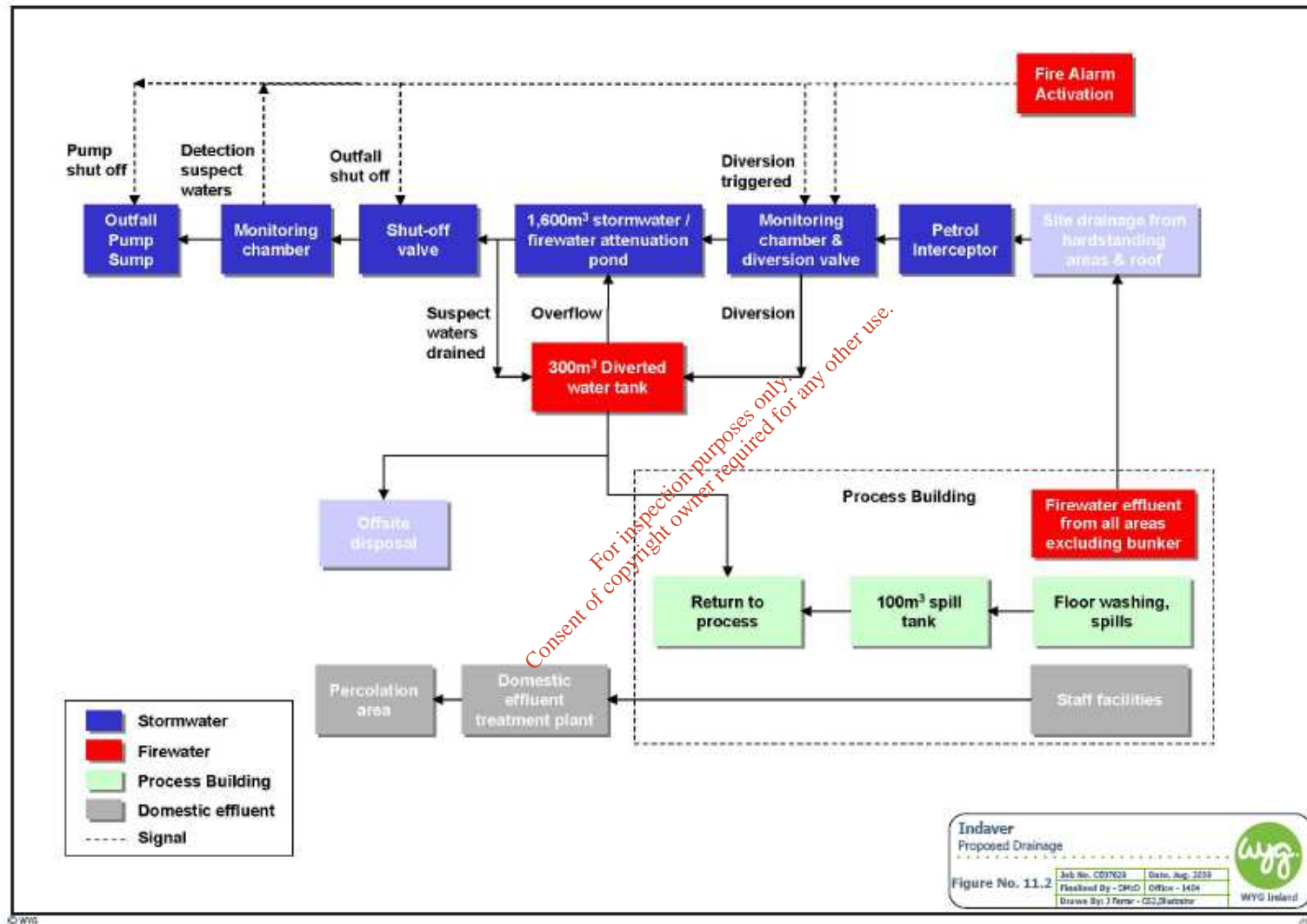


Figure 4 Proposed Drainage system for Waste to Energy Facility

12. ECOLOGY

As part of the 2006 and 2009 EIS', flora, mammal and bird surveys were conducted at the development site. No designated habitats of international or national value were recorded on or adjacent to the site. All the habitats recorded on site are widespread within the landscape and of moderate to low species-richness.

This chapter has been prepared based on a review of the previous ecological assessments of the site. The primary ecological assessment for the development was undertaken in 2005 and addressed the potential impacts of the proposed development on the flora and fauna of the site and its environs. As the primary facility has now been constructed and is operational, a number of ecological mitigation measures recommended in previous EIS's have now been implemented.

The proposed amendments to the development will have no significant impact on the ecology of the site. A number of mitigation measures have now been completed and should ensure that any potential impacts to flora, fauna and birds are minimised.

13. TRAFFIC

The existing Waste to Energy Facility at Carranstown, Co Meath consists of a 70 MW Waste to Energy Plant which has a capacity of 200,000 tonnes per annum for the treatment of Non Hazardous Waste. This proposal includes for a 10% increase in the capacity of the existing facility to 220,000 tonnes per annum and extending the opening hours on Monday to Fridays from between 08:00-18:30 (10.5 hours) to 06:00-20:00 (14 hours) and on Saturdays from between 08:00-14:00 (6 hours) to 06:00-14:00 (8 hours).

The subject site is located on the R152 Regional Road linking Drogheda and Duleek. Access to the subject site is via the existing R152 Drogheda to Duleek Road. The main routes that carry traffic to and from the development are the R152, the N2 and the M1 motorway. There are 5 main haul routes as follows:

- (i) From Drogheda via the R152;
- (ii) From Louth and Monaghan via the M1 Motorway and R152;
- (iii) From Navan and surrounds via the R153 through Kentstown, across the N2 and then via the R150 through Duleek to join the R152;
- (iv) From Ashbourne via the N2 and R152 from Kilmoon Cross;
- (v) From east Meath via the R150 through Julianstown.

The traffic data used in this assessment is based on two separate traffic counts, one carried out on a Wednesday in May 2009, when the plant was under construction, at 8 locations on the haul routes, and

the second being three 7 day Automatic Traffic Count (ATC) surveys in December 2011 at different locations on the haul routes and one Manual Classified Count (MCC) survey at the site entrance.

In order to assess the worst case scenario of the expansion of the plant capacity, the likely benefits of the spread of traffic associated with the proposed extended operating times has been ignored. It is estimated that a maximum average of 8 additional truck movements would be anticipated in during the above peak hours as a result of the proposed increase in facility capacity.

The R152/R150 junction will continue operate well within capacity under the expected traffic conditions with no significant loss in spare capacity as a result of the traffic generated by the development.

The M1/R152 junction will continue to operate well within capacity under the expected traffic conditions with no significant loss in spare capacity as a result of the traffic generated by the expansion.

The traffic flow at the R150/R152 junction will reach capacity in the year 2013. The construction of the planned Duleek by-pass will improve the traffic flows in and around the village of Duleek, particularly the R150/ R152 junction.

Construction Traffic

Only very minor construction works are proposed and its maximum expected construction period for the proposed facility is 1 month. During this period, there will be a maximum of 10 people employed in the construction activities.

It is expected that construction traffic will not be generated during the peak morning and evening hours. As a result, the traffic impact of the proposed development will be negligible during peak morning and evening hours. As demonstrated previously, the surrounding road network is has sufficient spare capacity to cater for the operational phase traffic. There is therefore sufficient capacity to cater for the predicted construction traffic.

14. LANDSCAPE & VISUAL IMPACT

A full assessment of landscape and visual impacts of the Waste to Energy facility on the land and surrounding areas to the site was undertaken in 2005 and was included in the EIS submitted with the planning application in February 2006. The proposed amendments entail the conversion of two temporary buildings (a modular office building and a spare parts building) to permanent use and three temporary areas of hard standing as part of the existing Waste-to-Energy Facility at Carranstown, Duleek, County Meath. The subject application also seeks to increase the through-put of the facility from 200,000 tonnes per annum to 220,000 tonnes per annum (a 10% increase).

In order to assess the likely visibility and consequent visual impact of the proposed amendments, a visual survey of the site was conducted on Friday the 27th of January 2012. From ARC's on-site assessment, it is clear that neither of the two buildings and none of the three areas of hard-standing are readily visible from outside the site. Glimpses of one of the buildings and one of the areas of hard-standing may be possible from just inside the gate. Since these features will not be visible from outside the site, they can have no visual impact on the surroundings.

It is predicted that the proposed amendments to the development will not result in any visual impacts.

15. CLIMATE

The climate assessment undertaken in 2009 comprehensively addressed the potential impacts of the emissions from the existing development on the climate of the site and its environs. This 2009 study has been updated to allow for an increase in waste accepted from 200,000 tonnes to 220,000 tonnes (including a possible maximum of between 10,000 – 15,000 tpa of suitable hazardous waste). Attention was focused both on Ireland's obligations under the Kyoto Protocol and the effect of the facility on the total national emissions of carbon dioxide and other greenhouse gases and also in the context of overall climatic impact with and without the development.

The contribution of the Waste-to-Energy Facility to total greenhouse gas emissions in Ireland is equivalent to only 0.09% of the Kyoto Target for Ireland in 2012, when energy recovery is taken into account. Moreover, compared to the "Do Nothing" scenario, emissions will increase by only 0.05% of the Kyoto Target for Ireland in 2012, when energy recovery is taken into account. Thus, the overall annual impact of the existing plant on climate is to increase greenhouse gas emissions by approximately 0.04% of the total greenhouse gas emissions in Ireland in 2012 and thus will be imperceptible in terms of Ireland's obligations under the Kyoto Protocol.

16. CULTURAL HERITAGE

An Archaeological Impact Assessment of the site was conducted in 2005 which included field walking and desk-based research. The study addressed the potential archaeological impact of the industrial development. During 2008-2009, topsoil stripping associated with the construction of the development was carried out and further information has become available from archaeological monitoring. These features have been assessed, recorded and documented by ADS. Topsoil stripping is now largely complete. It is therefore unlikely that construction of the proposed amendments to the development will have any impact on any further archaeological features which may survive below ground at the development site.

Any further topsoil stripping works at the site will be monitored by a suitably qualified archaeologist as required by planning condition 10 of the existing planning permission.

The physical impact of the development due to its proximity to the World Heritage Site of Newgrange was considered in the 2006 EIS. The facility is a minimum of 3km from the river valley and approximately 5km from the boundary of the World Heritage Site, sufficiently distant so as to render any archaeological impacts not significant. The UNESCO-ICOMOS monitoring mission which reported on the site in 2004, also considered the direct impacts and found that *there were no grounds for believing that the construction of the proposed incinerator itself would have a direct impact on the outstanding universal value of the World heritage site. Any effect on possible archaeological sites of local interest within the application area would be mitigated by archaeological monitoring.*

A report entitled *Assessment Of Air Quality Impact Of Carranstown Waste Management Facility At Bru Na Boinne* was completed by AWN in March 2004. A USEPA approved air dispersion model was used to predict ground level concentrations at Bru na Boinne resulting from compounds emitted at the proposed facility at Carranstown. It was concluded that the impact of air emissions from the facility at Bru na Boinne will be insignificant. As is demonstrated in Chapter 7 Air Quality there is no significant change in the emissions from the development as modelled in 2006 and the proposed amended development. It has therefore not been necessary to reassess the impact on Bru na Boinne.

17. MATERIAL ASSETS

Material assets are defined as *'resources that are valued and that are intrinsic to specific places, they may be either human or natural origin and the value may arise for either economic or cultural reasons'*.

Property Prices

In developments of all sizes, types and scales there are often short-term impacts on adjoining assets and properties. This is due to the precautionary nature of people to purchase at a time of construction. Since the facility was granted planning permission, Ireland has experienced a major economic recession and property prices have fallen nationwide. At present it is difficult to assess whether the construction of the facility has had an impact on local property prices as very few transactions are taking place. Overall it is considered unlikely that the proposed amendments will impact on property prices now construction is complete. It is likely that the perceived belief that there will be long-term negative impact due to the location of the incinerator was based on mis-information regarding the facility's impact on public health or the environment. It is now proposed to accept some additional waste streams at the facility which carry a hazardous EWC codes and hence are classified as "hazardous waste". There may be a further perceived risk of negative impacts by members of the public associated with the acceptance of these waste streams, but as explained in Chapter 2, these waste streams are already present in the MSW waste stream and are mainly commonplace materials (such as empty paint tins, rags, etc).

With mitigation measures specified in place, neither the construction nor operational phases of the development will result in any significant negative impacts on the existing economic assets.

Electricity and Water Supply

The 70 MW Waste to Energy Plant generates approximately 16.56MW of electrical output of which c.2MW is used to meet the electrical demands of the facility itself leaving 14.49MW to be exported to the National Grid.

The waste to energy plant exports electricity to the local electrical distribution system via a 38 kV line to Rathmullan Substation about 2.5km north of the site. The line was installed as an underground cable and has not resulted in any visual impact. The proposed amendments will not have any impact on energy generation or energy usage within the plant.

The plant uses an effluent free flue gas cleaning process and an air cooled condenser rather than cooling towers and as a result it has a significantly lower water requirement than would otherwise be the case. The water requirement for the process has already been reduced from 11.6m³ per hour to 8.5m³ per hour. The biggest water requirement is for flue gas cleaning. Process water (for the steam cycle), drinking water, domestic potable water and water for cleaning account for the rest of the demand.

Agriculture

Though the site is located in agricultural surroundings and was a former agricultural site itself, it is not considered that the existing facility or the proposed amendments will have any impact on agriculture in the area. The facility is operated under strictest emissions controls and with full regulatory compliance will ensure no significant negative impacts. The potential impacts of this development to agriculture is addressed in relation to soils and discussed in greater detail in Chapter 10 (Soils and Geology). Likewise the assimilative capacity of air and water and their respective potential impacts are discussed in Sections 7 and 10 respectively. See Chapter 6 for potential impact to human health.

As part of the EPA licence for operation of the facility, the Agency is carrying out a programme of monitoring in the areas around the waste-to-energy facility. The programme includes monitoring of food produce in the vicinity in conjunction with the Food Safety Authority of Ireland.

Due to the strict emissions controls and regulatory compliance that the plant is and will be working under, no significant negative impacts to adjacent agricultural lands are expected.

18. CONSTRUCTION

The Construction chapter sets out the construction works required for the proposed amendments and indicates the mitigation measures to be implemented to ensure that potential environmental impacts are minimised. The proposed amendments will entail some very minor construction works.

From a construction perspective, the majority of the proposed physical amendments relate to the change of status of existing temporary structures to permanent status and will therefore only require connection to roadways, drainage systems, installation of footpaths, hardstanding, car parking spaces etc. A new domestic effluent treatment is required for the modular office block.

Construction Hours

The site construction working hours will be confined to between 0700 and 1900 hours Monday to Saturday, inclusive (excluding public holidays and Sundays). Working hours may vary slightly depending on weather conditions and daylight hours during winter months.

Construction Impacts and Mitigation

Construction works completed at the site are to be small scale and short in duration. All construction works will be completed in accordance with the environmental management plan for the site and the facility licence. The facility licence and the monitoring regime set out by it ensures that all potential nuisances (including traffic management, dust, noise, vibration, litter etc) are managed in accordance with best practice.

Good housekeeping and facility management during the construction period will ensure that there will be no negative environmental impacts from construction works.

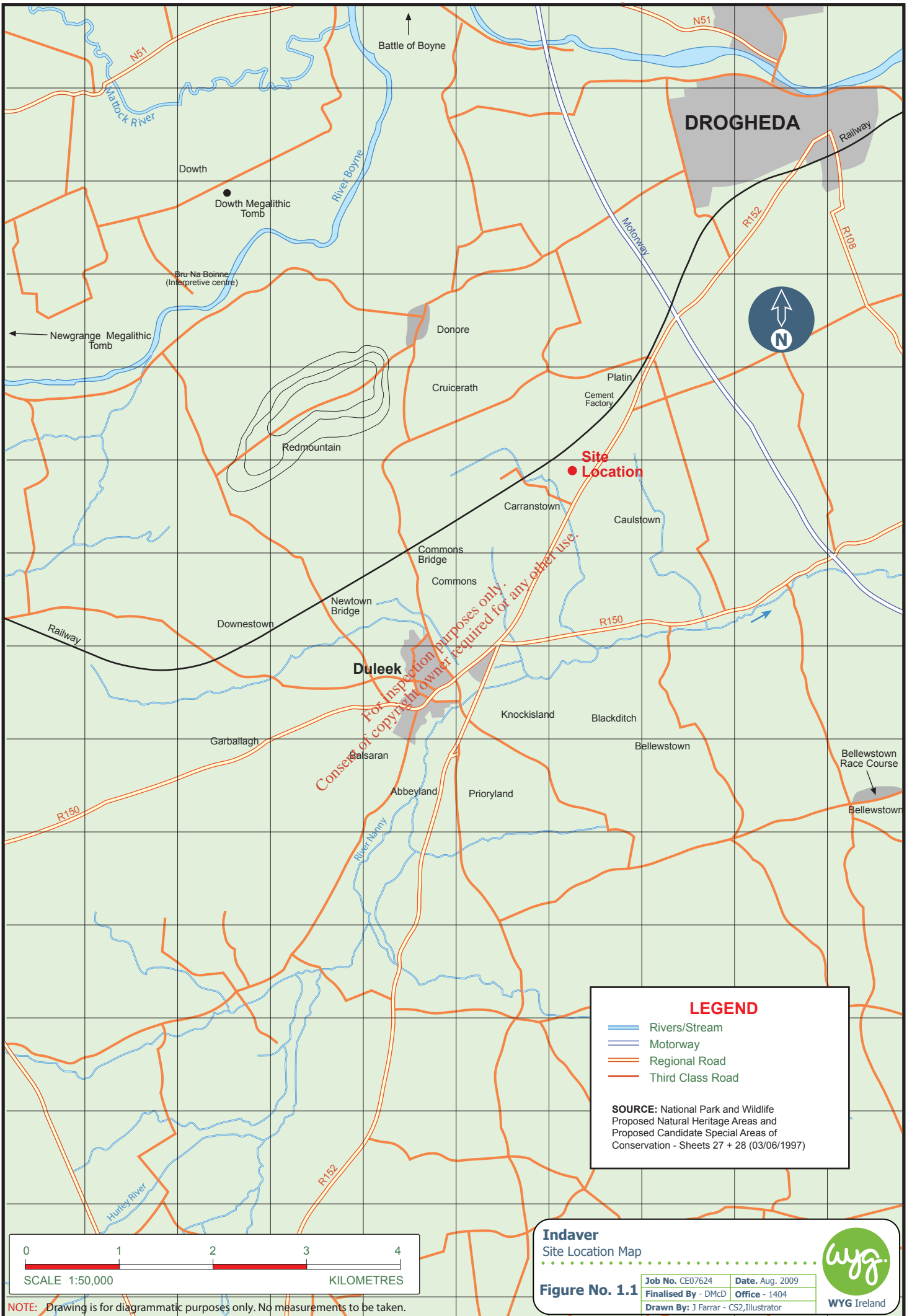
19. INTERACTIONS

Interactions between various environmental factors were completed as part of the environmental impact assessment. The impacts and likely significant effects on the interaction between the following environmental media were assessed: human beings; flora and fauna; soils and groundwater; surface water; air; noise; climate; material assets; and the landscape. The interaction matrix (19.1 below) is based on the potential interrelationships of the environmental media as a result of the proposed amendments to the development.

Table 19.1 Interactions between Environmental Media

	Human Beings	Air	Noise	Landscape	Flora & Fauna	Surface Water	Soils & Groundwater	Climate	Material Assets
Human Beings									
Air									
Noise									
Landscape									
Flora & Fauna									
Surface Water									
Soils & Groundwater									
Climate									
Material Assets									

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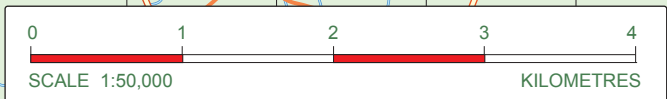


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LEGEND

- Rivers/Stream
- Motorway
- Regional Road
- Third Class Road

SOURCE: National Park and Wildlife Proposed Natural Heritage Areas and Proposed Candidate Special Areas of Conservation - Sheets 27 + 28 (03/06/1997)



NOTE: Drawing is for diagrammatic purposes only. No measurements to be taken.

Indaver
 Site Location Map

Figure No. 1.1

Job No. CE07624	Date. Aug. 2009
Finalised By - DMcD	Office - 1404
Drawn By: J Farrar - CS2,illustrator	

WYG Ireland