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Environmental Protection Agency

PO Box 3000

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Date 13/03/2014

Re: W-0282-01 EPA Notice for the purposes of Section 76A(3) of the Waste Management Act as amended 19/02/2014

To whom it may concern,

Please find attached to this document confirmation of Glanpower Ltds compliance check with the requirements of Regulation 9 of the EPA (Industrial Emissions) (Licensing) Regulations 2013 as carried out in accordance with the Annex 2 EPA Checklist for Regulation 9 Compliance document. Glanpower Ltd have carried out a full review of the requirements and have decided that all requirements have been met in the prior submissions made to date. Attachment 1 below is a completed checklist as required by the Agency whereby identification of where each Regulation 9 Compliance requirement is addressed in previously submitted documentation. Glanpower have reviewed this internally and also via our consultants RME Environmental.

Glanpower Ltd have identified that the previous waste licensing submission documents did not require addressing Regulation 9(2)(o) which is related to confirming measures taken to minimise pollution over long distances or in the territory of other states. Glanpower have included document I.8 as attachment 2 below to this document detailing where Glanpower believes this submission has been addressed in previous submissions.

Glanpower Regulation 9 Compliance submission 13/03/14

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I trust this is to the satisfaction of the Agency and should there be any further queries please do not hesitate to contact me.

Yours Sincerely

A handwritten signature in blue ink that reads "Raphael Mc Evoy".

**Raphael Mc Evoy,
Managing Director
Glanpower Ltd**

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**Attachment No. 1: Annex 2 EPA Checklist for Regulation 9 Compliance document
Regulation 9(2)**

	Section in Application	Checked by Applicant ✓
<p>(a) Give:</p> <p>(i) the name, address and telephone number of the applicant and, if different, any address to which correspondence relating to the application should be sent and, if the applicant is a body corporate, the address of its registered or principal office, give the location or postal address (including where appropriate, the name of the relevant townland or townlands) and the National Grid reference of the premises to which the activity relates,</p> <p>(iii) give the name of the planning authority in whose functional area the activity is or will be carried on, and</p> <p>(iv) in the case of a discharge of any trade effluent or other matter (other than domestic sewage or storm water) to a sewer of a Water Services Authority, give the name of the Water Services Authority in which the sewer is vested or by which it is controlled,</p>	<p>Section B1 ✓</p> <p>Section B2 ✓</p> <p>Section B3 ✓</p> <p>Section B4 ✓</p>	
<p>(b) give -</p> <p>(i) in the case of an established activity, the number of employees and other persons working or engaged in connection with the activity on the date after which a licence is required and during normal levels of operation, or</p> <p>(ii) in any other case, the gross capital cost of the activity to which the application relates,</p>	<p>N/A ✓</p> <p>N/A ✓</p>	
<p>(c) specify the relevant class or classes in the First Schedule to the Act to which the integrated pollution control activity relates,</p>	<p>N/A ✓</p>	
<p>(d) In accordance with section 87(1B)(a) of the Act of 1992 in the case where an application for permission for the development comprising or for the purposes of the integrated pollution control activity to which the application for the licence relates is currently under consideration by the planning authority concerned or An Bord Pleanála a written confirmation from the planning authority or An Bord Pleanála, as appropriate, of that fat together with either:</p>	<p>N/A ✓</p>	



	<p>(i) a copy of the environmental impact statement, 2 hard copies and 2 electronic copies or in such form as may be specified by the Agency, that was required to be submitted with the application for permission, or</p> <p>(ii) a written confirmation from the planning authority or An Bord Pleanála that an environmental impact assessment is not required by or under the Act of 2000,</p>	N/A N/A	✓ ✓
(e)	<p>In accordance with section 87(1B)(b) of the Act of 1992 in the case where permission for the development comprising or for the purposes of the integrated pollution control activity to which the application for the licence relates has been granted, a copy of the grant of permission together with either:</p> <p>(i) a copy of the environmental impact statement, 2 hard copies and 2 electronic copies or in such form as may be specified by the Agency, that was required to be submitted with the application for permission, or</p> <p>(ii) a written confirmation from the planning authority or An Bord Pleanála that an environmental impact assessment was not required by or under the Act of 2000,</p>	Section B3 of application and attachment B3 Submitted with application 22/06/12	✓ ✓
(f)	specify the raw and ancillary materials, substances, preparations, fuels and energy which will be produced by or utilised in the activity,	Section G1 and G2	✓
(g)	describe the plant, methods, processes, ancillary processes, abatement, recovery and treatment systems, and operating procedures for the activity,	Section D1, D2 and F1	✓



Regulation 9(2) continued.. /		Section in Application	Checked by Applicant ✓
(h)	indicate how the requirements of section 83(5)(a)(i) to (v), (vii) and (viii) to (x) of the Act shall be met, having regard, where appropriate, to any relevant specification issued by the Agency under section 5(3) of the Act and the reasons for the selection of the arrangements proposed,	Attachment E1 - E6 Attachment E4 - E6 Attachment F1 - F7 Attachment G1 and G2 Attachment J1 Attachment H1 - H5	✓
(i)	give particulars of the source, nature, composition, temperature, volume, level, rate, method of treatment and location of emissions, and the period or periods during which the emissions are made or are to be made,	Attachment E and F.I. section 3.5, 3.6, 3.8, 3.10 & 3.13	✓
(j)	identify monitoring and sampling points and outline proposals for monitoring emissions and the environmental consequences of any such emissions,	Attachment E, F and Appendix A - EIS F.I. 3.1, 3.13, 3.10	✓
(k)	provide: (i) details, and an assessment, of the impacts of any existing or proposed emissions on the environment, including on an environmental medium other than that or those into which the emissions are or are to be made, and (ii) details of the proposed measures to prevent or eliminate, or where that is not practicable, to limit, reduce or abate emissions,	Attachment E, F and Appendix A - EIS F.I. 3.1, 3.13, 3.10	✓

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Regulation 9(2) continued.. /		Section in Application	Checked by Applicant ✓
(l)	describe in outline the main alternatives, if any, to the proposals contained in the application which were studied by the applicant,	Appendix A -EIS Section: Alternatives	✓
(m)	describe the condition of the site of the installation,	Section 3.12 Of F.I. Baseline monitoring report (to be attached)	✓
(n)	specify the measures to be taken to comply with an environmental quality standard where such a standard requires stricter conditions to be attached to a licence than would otherwise be determined by reference to best available techniques	Attach F Attach L.1.3 Appendix L	✓
(o)	describe the measures to be taken for minimising pollution over long distances or in the territory of other states,	Please refer to Attachment I	✓
(p)	describe the measures to be taken under abnormal operating conditions, including start-up, shutdown, leaks, malfunctions, breakdowns and momentary stoppages	Attach J and D Table F1 in appendix F2 emissions to air (to be attached)	✓
(q)	describe the measures to be taken on and following the permanent cessation of the activity or part of the activity to avoid any risk of environmental pollution and to return the site of the activity to a satisfactory state,	Attachment K1 Attach 4 of F.I Attach 10 of F.I.	✓

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Regulation 9(2) continued.. /

		Section in Application	Checked by Applicant ✓
(r)	describe the arrangements for the prevention or minimisation of waste and, where waste is produced, the on and of site arrangements for the recovery or disposal of solid and liquid wastes,	Section H1 of application Section D.1.t (i) point d Attach H1 Section 3.1 of F.I.	✓
(s)	specify, by reference to the relevant European Waste Catalogue codes as prescribed by Commission Decision 2000/532/EC of 3 May 2000, the quantity and nature of the waste or wastes produced or to be produced by the activity or the quantity and nature of the waste or waste accepted or to be accepted at the installation,	Section H of application form Attach H1 Appendix H1	✓
(t)	state whether the activity consists of, comprises, or is for the purposes an establishment to which the European Communities (Control of Major Accident Hazards involving Dangerous Substances) Regulations, 2006 (S.I. No. 74 of 2006) apply,	Section B8 of application form	✓
(u)	describe, in the case of an activity which gives, or could give rise, to an emission containing a hazardous substance which is discharged to an aquifer and is specified in the Annex to Council Directive 80/68/EEC of 17 December 1979 on the protection of groundwater against pollution caused by certain dangerous substances, the arrangements necessary to comply with said Council Directive, and	N/A	✓
(v)	include a non-technical summary of information provided in relation to the matters specified in subparagraphs (c) and (f) to (u) of this paragraph.	Attach A of application form	✓



Regulation 9(3) An application for a review of a licence shall:		Section in Application	Checked by Applicant ✓
(a)	state the grounds on which it is made,	N/A	✓
(b)	Specify the reference number given to the relevant licence in the register,	N/A	✓
(c)	Include the information specified in paragraph (2) and such plans, documents and particulars as are specified under paragraph (4) to the extent and in such a manner as may be specified by the Agency.	N/A	✓
(a)	a copy of the relevant page of the newspaper in which the notice in accordance with Regulation 5 has been published,	Attach B6 Appendix B8	✓
(b)	a copy of the text of the site notice erected or fixed on the land or structure in accordance with Regulation 6,	Appendix B9	✓
(c)	a copy of the notice given to the planning authority under section 87(1)(a) of the Act,	Appendix B10	✓
(d)	a copy of such plans, including a site plan and location map (no larger than A3), and such other particulars, reports and supporting documentation as are necessary to identify and describe -	Appendix D	✓
	(i) the activity	Appendix D	✓



	Regulation 9(3) An application for a review of a licence shall:	Section in Application	Checked by Applicant ✓
	(ii) the position of the site notice in accordance with Regulation 6,	Appendix D	✓
	(iii) the point or points from which emissions are made or are to be made, and	Appendix D	✓
	(iv) monitoring and sampling points, and	Appendix D	✓
(e)	a fee specified in accordance with section 99A of the Act of 1992.	Included section B.7.3	✓

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Attachment 2: Attachment I.8 Regulation 9 (2) (o) response

Attachment I.8 and Regulation 9 (2) (o)

In compliance with the requirements of IED Regulation 9(2)(o) the Agency is referred to section 9 W0282-01 Response to EPA "Request for Information, Article 12 Compliance Requirements" dated July 10 2013 Glanpower believe that the request to "describe the measures to be taken for minimising pollution over long distances or in the territory of other states" as is required in Section I is dealt with in the existing submission. This addendum is added to comply with the requirements of Regulation 9 (2) (o) as the original waste licence application did not require verification on "measures to be taken to minimise pollution over long distances".

The proposed facility has undertaken a significant amount of measures designed to minimise pollution over long distances that may result from the operation of the facility. The project design team have assessed thoroughly the potential emissions to air, surface water and Ground water from the facility

Potential Emissions to Air:

Section 3 of the Article 12 Compliance requirements as submitted on July 10 2013 highlights all of the potential atmospheric emissions from the facility as proposed. Appendix 3 of the same submission documents in tabular form the potential atmospheric emissions (E Tables) and Appendix 3 (F Tables) also describes the monitoring and control equipment and requirements to effectively minimise the effects both locally and over long distances of any potential atmospheric emissions.

Section 3.10 of the Article 12 Compliance document submitted to the EPA on July 10 2013 describes the "Air Impact Assessment" for the proposed development and draws the



conclusion that *“even at maximum potential emissions from the operation of the proposed Energy Centre ambient air quality will remain below the relevant air quality standard limits and guidelines values. Therefore it is concluded that there is no predicted significant impact on air quality due to the operation of the proposed facility”*. This conclusion is determined to include all potential impacts from the facility to air either proximate or at long distances from the site.

Potential Emissions to Surface Water and Groundwater

Sections F3 and F5 of the original application to the Agency and attachments F3 and F5 respectively have described the potential surface water and groundwater emissions from the propose facility. Neither have been deemed to be significant in the Application itself or indeed via the assessments made in the Environmental Impact Assessment as submitted also with the original application. Therefore with no local significant impact predicted and with adequate onsite bunding and materials management there will be no adverse long distance threats to either receiving element.

The Screening for appropriate Assessment review document as submitted as Attachment 11 of the Article 12 Compliance document on July 10 2013 documents potential sensitive receptors and European heritage sites at distances of 3.5 km (Charleville Wood SAC 000571), 5.6 Km (River Barrow and River Nore SAC 002162), 9.4 km (Slieve bloom Mountains SPA 004160) and 14.3 km (Raheenmore Bog SAC00582). The Report concludes for all sites that *“there is no impact pathway or other type of relationship between the proposed development and the European Sites”*. The final conclusion of the report states *“The AA screening process identified only one European Site that may be linked via potential impact pathways to the proposed development due to its proximity. All likely significant effects that could arise from the proposed development have been addressed within the design of the facility that achieves compliance with air quality standards and does not affect the areas covered by the site designations. Based on the information available, it*



was determined that it was possible to rule out likely significant impacts on European Sites. This conclusion has been reached by an analysis of Qualifying Interests of all European Sites and of the threats potentially preventing these Qualifying Interests from maintaining favourable conservation status.

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Attachment 3: Revised Attachment A: Non-Technical Summary Document

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Attachment 3: Revised Attachment A: Non-Technical Summary Document

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ATTACHMENT A

NON-TECHNICAL SUMMARY

(29 pages)

- A.1.1: Introduction
- A.1.2: Company & Facility Overview
- A.1.3: Management of the Facility
- A.1.4: Infrastructure & Operation
- A.1.5: Emissions
- A.1.6: Emission Control & Abatement
- A.1.7: Monitoring of Emissions
- A.1.8: Resource Use & Energy Efficiency
- A.1.9: Materials Handling
- A.1.10: Existing Environment & Impact of the Facility
- A.1.11: Accident Prevention & Emergency Response
- A.1.12: Remediation, Decommissioning, Restoration & Aftercare
- A.1.13: Statutory Requirements
- A.1.14: Declaration of Application
- A.1.15: Glossary of Terms

ATTACHMENT A.1 NON-TECHNICAL SUMMARY

A.1.1 Introduction

Glanpower Ltd. (company registration number 465847), with registered offices at 19 High Street, Tullamore, Co. Offaly is applying to the Environmental Protection Agency (EPA) for a waste licence. The purpose of the application is for the company to operate a proposed energy from waste facility at Derryclure, Tullamore, County Offaly.

Notification of the application has been posted at the site location; submitted in writing to Offaly County Council, and advertised in the *Tullamore Tribune* newspaper, issue of 14th June 2012.

Following construction and testing, the proposed facility will utilise municipal waste (65,000tonnes per annum) and energy crop biomass (10,000tonnes per annum) for the generation of renewable energy, by a system based on pyrolysis technology.

The proposed facility will be constructed on a site in the townland of Derryclure, located approximately 8km south of Tullamore, Co. Offaly as shown in Figure A.1.1. The site is entirely within the functional area of Offaly County Council and is adjacent to the existing N80 national secondary road.

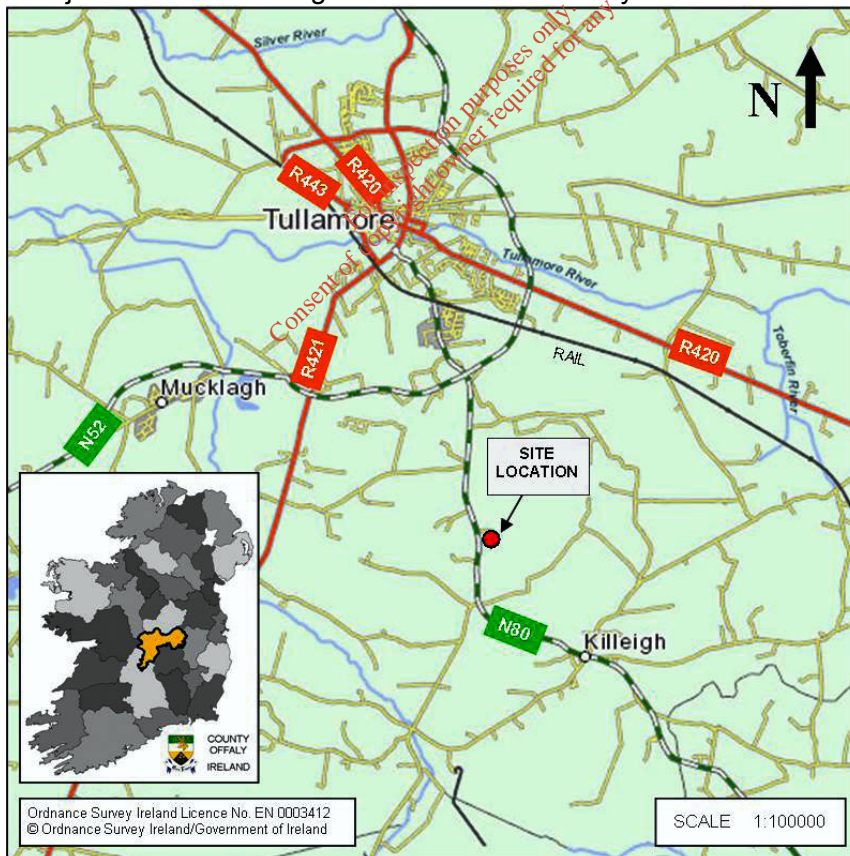


Figure A.1.1: Location of the Site

The site of the proposed facility (grid reference 2351E, 2202N) is approximately 4.5ha (11.3acres) in size and was selected based on its central location with the Midlands Region and other factors including spatial issues, planning considerations, environmental screening, road network connectivity and capacity, electricity grid accessibility, historic land use and financial considerations.

The waste to be accepted at the facility will comprise 65,000tonnes per annum of non-hazardous mixed municipal household and commercial waste. Waste will be subject to pre-treatment on-site prior to recovery.

The facility was granted planning permission by An Bord Pleanála (planning ref. PL19.238420) on 21st July 2011. The application for planning permission was supported by the submission of an Environmental Impact Statement (EIS). A copy of the EIS is included with this application.

A.1.2 Company & Facility Overview

A.1.2a Company Information

Glanpower is a wholly Irish-owned and operated company, dedicated to the development and operation of environmentally sustainable, alternative power generation projects in Ireland and abroad. Glanpower's aim is to produce energy which is dependable, costeffective, environmentally responsible, and which is derived from renewable sources. Further company information and contact details are included in the form submitted as part of the application.

Glanpower was founded in 2008. The company's primary purpose at that time was to research and develop renewable energy opportunities within the Irish energy market. Included in the company's research were investigations into the best available and emerging technologies in wind energy, solar energy and energy-from-waste, both in Ireland and abroad. The key outcome of that research was, in broad terms, to develop particular core technologies and bring them to full energy production status. Since that time, Glanpower has increasingly focused its attention on the energy-from-waste sector. The company has identified a pyrolysis system suitable for the thermal treatment of waste (and biomass), uniquely configured to be sustainable and responsible.

A.1.2b Facility Overview

The facility will support national and regional waste policy, by providing a local means of handling waste produced within the Midlands area and diverting waste from landfill.

The generation and export of electricity from waste and biomass sources delivers added benefits. The facility will support greater energy security as it will provide a local source of energy, helping to reduce dependence on imported fuel. Also the production of electricity from renewable means will help to reduce dependence on fossil fuels which are a non-renewable source of energy.

The proposed Glanpower Energy from Waste facility has been submitted to the European Investment Bank as one of two Irish proposals for the EU Commission NER 300 funding programme for innovative renewable energy¹.

A.1.2c Classes of Activity

The proposed facility will be classified under a number of the waste activities defined in the Fourth Schedule of the Waste Managements Acts 1996 to 2011.

The principal class of waste activity applicable, under the Fourth Schedule of the Waste Management Acts 1996 to 2011, will be as follows:

“R 1. Use principally as a fuel or other means to generate energy: This includes incineration facilities dedicated to the processing of municipal solid waste only where their energy efficiency is equal to or above:

- 0.60 for installations in operation and permitted in accordance with applicable Community acts before 1 January 2009,*
- 0.65 for installations permitted after 31 December 2008, using the following formula, applied in accordance with the reference document on Best Available Techniques for Waste Incineration:*

Energy Efficiency = $(E_p - (E_f + E_i)) / (0.97 \times (E_w + E_f))$

where-

- ‘E_p’ means annual energy produced as heat or electricity and is calculated with energy in the form of electricity being multiplied by 2.6 and heat produced for commercial use multiplied by 1.1 (GJ/year),*
- ‘E_f’ means annual energy input to the system from fuels contributing to the production of steam (GJ/year),*
- ‘E_w’ means annual energy contained in the treated waste calculated using the net calorific value of the waste (GJ/year),*
- ‘E_i’ means annual energy imported excluding E_w and B_f (GJ/year),*
- ‘0.97’ is a factor accounting for energy losses due to bottom ash and radiation.”*

The other classes of activity applicable to the proposed facility, under the Fourth Schedule of the Waste Management Acts 1996 to 2011, include: *“R 12. Exchange of waste for submission to any of the operations numbered R 1 to R 11 (if there is no other R code appropriate, this can include preliminary operations prior to recovery including preprocessing such as, amongst others, dismantling, sorting, crushing, compacting, pelletising, drying, shredding, conditioning, repackaging, separating, blending or mixing prior to submission to any of the operations numbered R1 to R11).”*

“R 13. Storage of waste pending any of the operations numbered R 1 to R 12 (excluding temporary storage (being preliminary storage

¹

<http://www.dcenr.gov.ie/Energy/Sustainable+and+Renewable+Energy+Division/NER+300.htm>, 29th May 2012

according to the definition of 'collection' in section 5(1), pending collection, on the site where the waste is produced)".

It is the intent of Glanpower to ensure the maximum recovery of both waste accepted and waste arising at the site. In this way, the quantity of waste consigned for disposal to landfill will be minimised (less than 15% of waste intake).

A.1.3 Management of the Facility

A.1.3a Technical Competence & Site Management

The Executive Board of Glanpower Ltd. will have overall responsibility for the construction and operation of the proposed facility. The facility will be operated by a dedicated management team. The staff of the facility will be technically experienced and qualified in the areas of waste; engineering; environmental management; health and safety; finance; administration, human resources and maintenance.

A.1.3b Environmental Management System

An Environmental Management System (EMS) will be developed by Glanpower for the management of the environmental aspects of the proposed facility. The EMS will address the provision of all resources, human and otherwise, necessary to ensure control and continuous improvement in the environmental management of the facility. The EMS will be subject to an assessment for suitability (management review) by a member of senior management, at least on a yearly basis.

A.1.3c Hours of Operation

Construction activities on-site (approximately 12 months duration) will be limited to the hours of 7:00am to 6:30pm Monday to Friday and 8:00am to 1:30pm Saturday. No construction activity will be permitted on a Sunday or public holidays.

Waste will be accepted during the hours of 7:00am to 6:00pm Monday to Saturday inclusive. Waste will not be accepted at the site on weekends or public holidays.

Handling, pre-treatment and processing of waste will be carried out within the facility building on a continual basis i.e. 24 hours per day. It is intended that continuous (24 hours per day) waste pre-treatment, storage and handling (R12/R13) activities will be facilitated at all times during the year i.e. up to 8,760 hours per annum. Based on the requirement for maintenance of pyrolysis/energy recovery plant, it is expected that pyrolysis and energy recovery (R1) activities will be carried on for approximately 8,000 hours per annum.

Deliveries of waste to the site will only be accepted at the facility from suitably permitted waste hauliers holding valid waste collection permits. Waste acceptance and handling procedures will be implemented onsite, which will include for the inspection of waste. Non-conforming waste materials which are not permitted at the facility will be quarantined for removal and appropriate treatment off-site as required.

A.1.4 Infrastructure & Operation

A.1.4a Site Infrastructure

The proposed facility will utilise energy crop biomass and mixed municipal waste materials to generate renewable energy.

The facility will consist of a single building, which will house the following:

- Reception and pre-treatment area;
- Enclosed fuel recovery area;
- Pyrolysis area;
- Engine areas;
- Office, visitor reception and staff accommodation;
- Ancillary accommodation (weighbridge, services including power, water mains, telephone/broadband);
- Maintenance areas.

Condensing units associated with the steam turbine will be located on the roof of the main building.

Externally the site will be secured by perimeter fencing and gates. The site will accommodate:

- Vehicular access roads and pedestrian footpaths;
- Staff and visitor car parking;
- Security hut;
- Service yard (and underground trade effluent tank);
- Emergency generator;
- Fuel oil storage tank and bund;
- Water storage tank and associated pump house;
- Regenerative Thermal Oxidiser (RTO);
- Fuel and lube oil delivery areas;
- Transformer compound;
- Emergency flare stack;
- Foul sewage treatment area;
- Vehicle utilities (wheelwash, weighbridge).

The main building will be a steel framed structure 7,740m² in size, 129m long and 60m wide, with a selected aluminium cladding to finish externally. Visually the building is divided into three sections or stages representing the internal processes involved, namely:

1. Reception & Pre-Treatment
2. Fuel Feed and Pyrolysis System
3. Engine, Steam Generation and Office Accommodation Areas

A schematic of the building layout is shown in Figure A.1.2.

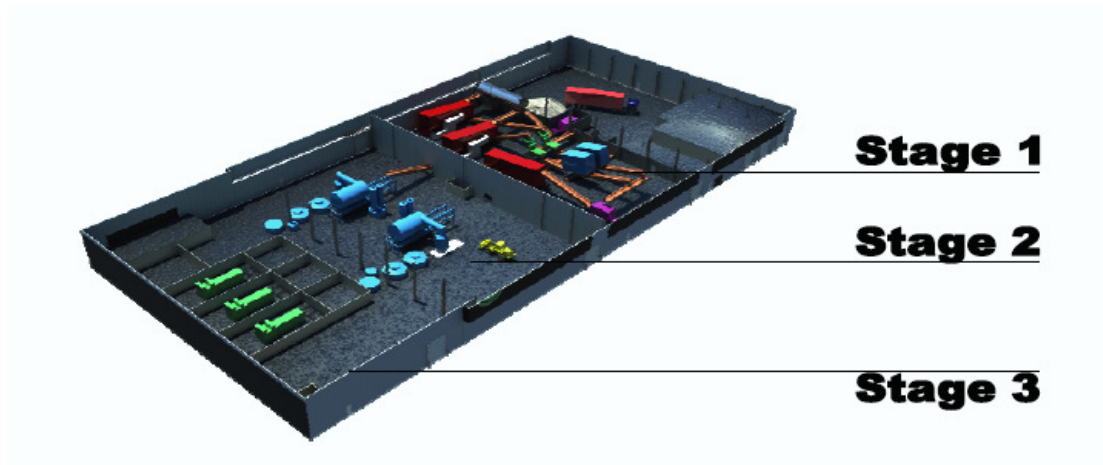


Figure A.1.2: Schematic of Facility

Three taller bays (height 15.9m) are expressed in a separate cladding panel and divided from each other by a translucent cladding bay. The final bay (height 11.4m) is to accommodate the engines and office accommodation. The main stack will be 30m (above ground) in height.

Service infrastructure on-site will include power, telephone/broadband, water mains, surface water network and a sanitary effluent treatment system.

A.1.4b Process Description

The proposed Glanpower pyrolysis plant has been developed as an efficient system to convert waste and energy crop biomass into a clean gas for electricity production. A summary of the process is shown in Figure A.1.3

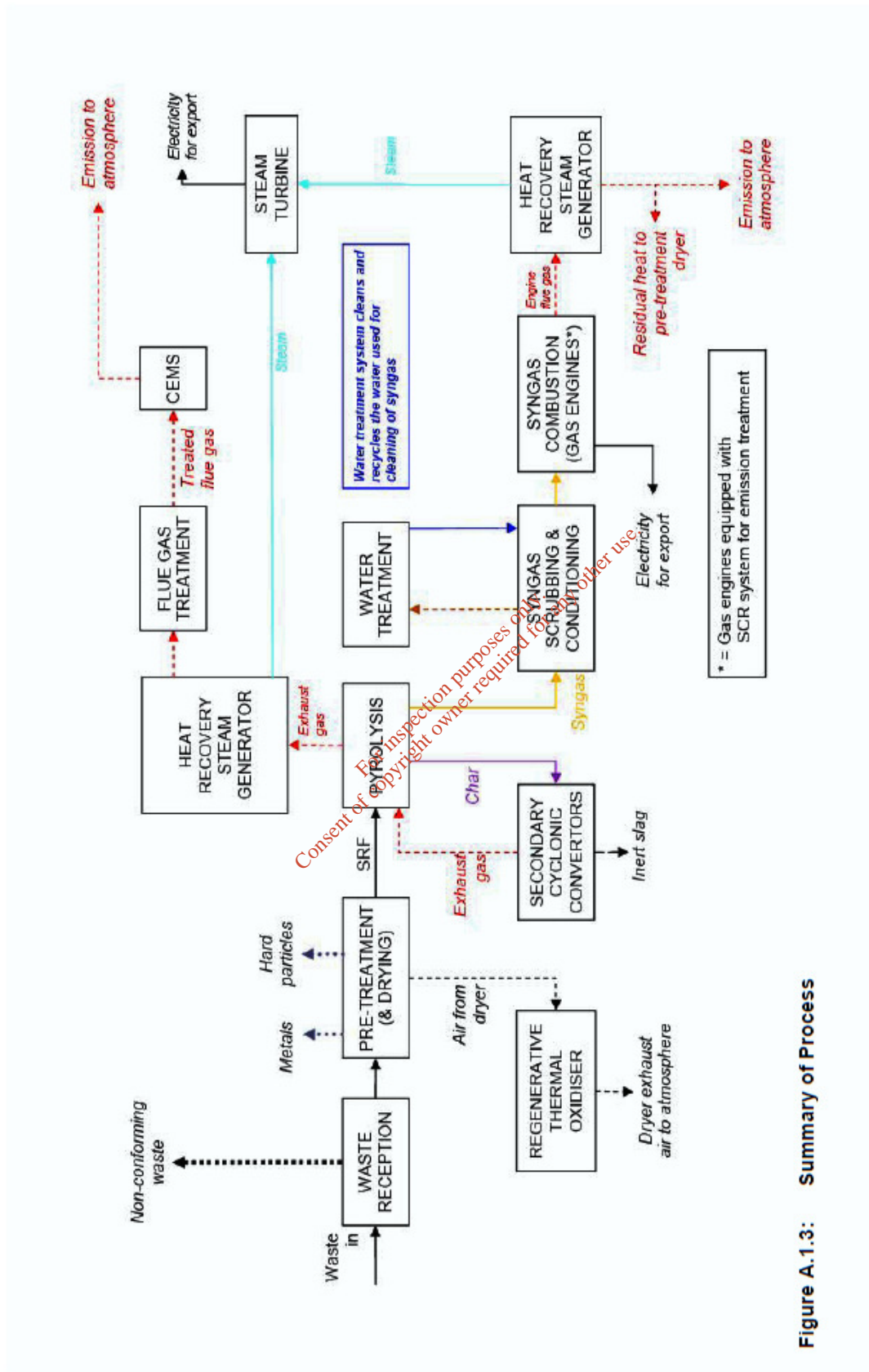


Figure A.1.3: Summary of Process

Pre-Treatment

The first step in the process is the reception, screening and pretreatment of waste. This is to ensure that unsuitable and potentially hazardous waste materials within the incoming waste feed are removed for appropriate recovery/disposal off-site. Unsuitable materials include batteries, electrical items, hazardous substances etc. Glass, metal and hard particles are also removed to enable the recycling of these fractions off-site. The pre-treatment stage, involving shredding and drying steps, converts the remaining waste in to a Solid Recovered Fuel (SRF). The SRF is then subject to pyrolysis, which is the core process step of the proposed Glanpower facility.

Pyrolysis

Pyrolysis is the thermochemical decomposition of material at elevated temperatures in the absence of oxygen. In contrast with conventional incineration, waste material is not directly combusted in a fire. Material is instead superheated (in the absence of oxygen) and broken down in to a gaseous by-product (synthesis gas or 'syngas') and a solid byproduct (char). The solid carbon char generated is used as the fuel to generate heat necessary for pyrolysis to occur.

Glanpower Pyrolysis System

In the case of the proposed Glanpower facility, pre-treated waste (or SRF) and energy crop biomass will be the materials subjected to pyrolysis. Heat in the pyrolysis flue gas will be recovered (steam generation) for use in a steam turbine for the production of electricity.

The syngas generated by the Glanpower pyrolysis system will be subsequently cleaned and combusted in three gas engines, for the direct generation of electricity. This electricity will be exported to the National Grid.

Excess heat energy in the gas engine flue stream will also be recovered for (steam generation) for use in the steam turbine to produce additional electricity. Residual heat remaining in the engine flue gas will also be recovered for drying waste at the pre-treatment stage.

Emissions

To minimise odour emissions from the handling of municipal waste, air to be ventilated will be passed through a dedicated odour abatement unit (if not used as process air). Odorous air arising from the drying step will also be specially vented, through a Regenerative Thermal Oxidiser. Exhaust emissions from the pyrolysis stage will be treated using a flue gas treatment system prior to discharge to atmosphere. Emissions from the gas engines will be through three 30m stacks.

All emissions from the plant to atmosphere (including noise), surface water and groundwater will be monitored continuously or at regular intervals as required.

Treatment of Process Water

Water is used in the process mainly for cleaning the syngas generated by pyrolysis.

A multi-step water treatment system will be employed to treat and recycle this water. Excess water will be diverted to the secondary cyclonic convertors.

Residues

The most significant residue stream arising from the operation of the facility will be a solid, inert, vitrified slag material arising from the combustion of char in the secondary cyclonic convertors (3,200tonnes per annum). Residues arising from the syngas cleaning and flue gas treatment steps will be reprocessed within the overall system.

Electricity Generation

The plant will generate 11MW electricity of which approximately 9MW will be exported to the National Grid via substation at Clonminch, Tullamore, Co. Offaly. Grid connection consent has been agreed and confirmed with ESB Networks. The main process steps may be summarised as follows:

- Waste reception;
- Waste pre-treatment;
- Waste drying;
- Fuel feed to pyrolysis chamber;
- Pyrolysis chamber;
- Char recovery and delivery system;
- Secondary cyclonic convertor (thermal oxidiser);
- Syngas scrubbing;
- Syngas conditioning;
- Heat recovery from pyrolysis;
- Syngas engines;
- Heat recovery from syngas engines;
- Flue gas treatment;
- Steam turbine;
- Scrubber water treatment system;
- Utilities.

A.1.4c Compliance with Waste Incineration Directive

The facility has been designed to comply with the requirements of the Waste Incineration Directive (2000/76/EC). This has been achieved in the following ways:

1. Limiting the scope of the facility to the acceptance of nonhazardous waste only and incorporating a pre-treatment stage in the design. The pre-treatment stage ensures that materials not suitable for pyrolysis are removed. The pre-treatment step has been designed to achieve a particular specification for moisture content, composition and particle size (prior to the pyrolysis step).

2. The heat generated in the process is recovered as far as practicable. Measures include (i) heat recycle from char combustion to pyrolysis chambers; (ii) heat recovery steam generators to recover heat from pyrolysis flue gas residual heat and gas engine heat; (ii) residual gas engine exhaust heat recovery for drying of waste at pre-treatment stage.
3. The main process residue will be a vitrified slag (from the combustion of pyrolysis-derived char) which is not harmful to the environment or human health. Residues from the gas scrubbing and flue gas treatment steps will be reprocessed within the pyrolysis system, directly in the plant.
4. Recyclable waste materials are removed insofar as practicable at the pre-treatment stage. The vitrified slag residue (3,200tonnes per annum or approximately 5% of waste intake) will initially be sent to landfill for disposal, however approval will be sought for use of the product as an aggregate for road building / land cover. Transport of such waste residues will only be carried out by hauliers holding a valid waste collection permit for the classes of waste concerned.

A.1.5 Emissions

The normal emissions from the facility will comprise:

- Emissions to air from pyrolysis units, waste handling/drying and gas engines;
- Emissions to surface water from site and roof runoff;
- Emissions to groundwater from sanitary effluent system;
- Noise emissions from operation of plant and vehicle movements.

The control and monitoring of emissions are described at Sections A.1.6 and A.1.7 respectively.

A.1.5a Emissions to Air

The sources of emissions to atmosphere resulting from the proposed Glanpower facility are summarised below. There will be no fugitive or uncontrolled emissions to air from the proposed facility.

- **2 no. PGE Prima 3000 Pyrolysis Units**
Emissions arising from the pyrolysis of pre-treated waste (Solid Recovered Fuel) and energy crop biomass will be made up primarily of oxides of nitrogen (NO_x), sulphur dioxide (SO₂) and carbon monoxide (CO). Other emission constituents, including particulates, volatile organic compounds (VOC), hydrogen chloride, hydrogen fluoride and metals arise in minor quantities.

The emissions arising from the two pyrolysis units will be emitted from one primary stack, 30m in height above ground on a continuous basis (except during planned shutdowns). The stack will emerge from the roof of the main building.

These emissions are regulated under the Waste Incineration Directive (WID).

- **3 no. Syngas-Fired Engines**

There will be three engines at the facility. Emissions arising from the combustion of syngas in the gas engines will be made up primarily of oxides of nitrogen (NO_x) and carbon monoxide (CO). Other emission constituents, including particulates and volatile organic compounds (VOC) arise in minor quantities. It has been verified with the engine supplier that the combustion of the syngas will cause emissions no higher than those resulting from the burning of natural gas.

The emissions from three gas engines will be emitted from three secondary stacks, 30m in height above ground on a continuous basis (except during planned shutdowns). These secondary stacks will emerge from the roof of the main building, adjacent to the primary stack described above. These emissions are not regulated under the Waste Incineration Directive.

- **Regenerative Thermal Oxidiser (associated with waste drying)**

The drying of waste at the pre-treatment stage will result in an off-gas stream of odorous air. This air will be treated in a single Regenerative Thermal Oxidiser (RTO) to decompose all odour generating components present in the dryer exhaust gas before it is emitted to atmosphere. The RTO is dedicated solely to the treatment of waste pre-treatment dryer exhaust air.

Emissions from the RTO will be emitted from 1 stack, 19m in height, on a continuous basis (except during planned shutdowns). This stack is located at the southern side of the main building. This emission (odour only) is not regulated under the Waste Incineration Directive.

- **Waste Reception Hall (management of odour)**

The handling of municipal waste in the waste reception hall will result in the presence of significant odour. The waste reception hall has been designed to be air tight to prevent the egress of odour to the external environment. Air not drawn for use in the process will be directed through a dedicated odour abatement unit and vented at 15m height. The emission of air from the waste reception hall will be on a continuous basis. This emission is not regulated under the Waste Incineration Directive.

- **Emergency generator**

A standard emergency generator will be installed at the facility to ensure continued operation in the event of loss of electrical power. Emissions to air will consist primarily of oxides of nitrogen (NO_x), carbon monoxide (CO) and dust. The emergency generator will only be operated under abnormal conditions (i.e. loss of power from National Grid and site supply) and for approximately 20 minutes weekly for testing.

A.1.5b Emissions to Surface Water

There will be one surface water emission point to an existing open drainage ditch at the west of the site. This drainage ditch ultimately discharges to the Clodiagh River, approximately 5km from the site.

Surface water emissions will comprise non-contaminated runoff from the internal site roadways, pavement and yard areas, in addition to runoff from building roof areas. All runoff water will drain to the outfall through an underground drainage network via petrol interceptors, grit traps and an underground surface water attenuation tank. The quantity and flow of surface water runoff at the outfall will vary depending on rainfall amounts.

The landscaped areas of the site will continue to drain naturally to existing drainage ditches and will not be open to sources of potential contamination from the process or operations on-site.

There will be no process effluent discharge from the facility to surface water.

A.1.5c Emissions to Sewer

There will be no emissions to a sewer of a sanitary authority from the proposed facility. All sanitary effluent from the facility (toilets, sinks, canteen etc.) will be treated on-site in a packaged treatment plant and discharged to groundwater via polishing filter.

A.1.5d Emissions to Groundwater

There will be one emission point to groundwater consisting of the discharge from the site sanitary effluent treatment system. Wastewater from toilets, sinks, showers, canteen and kitchen areas will be treated on-site in a package effluent treatment plant. The treatment system and polishing filter have been designed in accordance with EPA guidelines and the requirements of Offaly County Council, to achieve a high standard of quality prior to discharge to groundwater. The effluent treatment system is based on Sequence Batch Reactor (SBR) technology, which is commonly used in domestic and commercial wastewater treatment. The effluent treatment system and discharge point to groundwater will be located in the southwest corner of the site.

There will be no fugitive or uncontrolled emissions from the facility to ground or groundwater.

The proposed activities will not give rise to an emission in to an aquifer containing the List I and II substances specified in the Annex to Council Directive 80/68/EEC as amended.

A.1.5e Noise Emissions

The main sources of external noise will be the regenerative thermal oxidiser, electrical transformers, emergency generator and roofmounted condenser units associated with the steam turbine. All other significant items of waste handling / process equipment will be housed indoors to minimise the emission of noise to the external environment. Equipment will be designed with acoustic enclosures.

A.1.5f Other Nuisances

All waste handling activities will be undertaken indoors to reduce the potential for bird nuisance, wind blown litter and vermin. The potential for wind blown litter is minimised as the site is located in a low lying area with shelter provided to the south by the existing Derryclure Woods. Additional shelter will be provided by means of site landscaping in accordance with planning requirements.

Measures planned to minimise dust include wheelwash provision; good housekeeping and site management practices; air-tight building design and the paving of roads, footpaths, yard and car-parking areas.

Traffic will be managed through the provision of a new left-turn decelerating lane from the N80 main road; new roundabout on the access road between the entrances of Derryclure landfill and the proposed facility; car parking facilities; new lighting and site speed limit.

The facility has been designed with detection, alarm and suppression systems for fire protection in consultation with Offaly County Council.

A.1.6 Emission Control & Abatement

The facility has been designed to ensure that emissions from the plant are not harmful to human health or the environment and are compliant with the relevant requirements of the Waste Incineration Directive (2000/76/EC). The monitoring of emissions is described at Section A.17.

A.1.6a Control of Emissions to Air

Emissions to air will be minimised in the first instance by a pretreatment step which ensures a consistent, homogeneous fuel feed for the pyrolysis system.

Emissions from Pyrolysis

The pyrolysis process further minimises harmful emissions by inherently avoiding the direct combustion of raw waste in an oxygen environment. The emissions arising from the pyrolysis process will be treated prior to discharge at the stack, using a combination of physical and chemical treatment in a flue gas treatment system.

Emissions from Gas Engines

The combustion of syngas in the gas engines will cause emissions no higher than those resulting from the burning of natural gas. The gas engines will be equipped with a Selective Catalytic Reduction system for treatment of flue gas. Accordingly these emissions will not have a harmful impact on air quality.

Emissions from Emergency Generator

The emissions arising from the emergency generator will be sampled and analysed when the generator is installed and commissioned. This will ensure the generator operates according to expected emission levels. Weekly testing of the generator and ongoing maintenance will ensure emissions do not exceed expected values. Emissions from the generator will only arise during abnormal conditions.

Control of Odour Emissions

The air-tight building design will ensure that potential odour emissions are eliminated to the greatest extent possible. Air not used in the process to be vented from the waste reception hall will be directed through a dedicated odour abatement unit before venting to atmosphere. A Regenerative Thermal Oxidiser (RTO) will be installed for the treatment of odour arising from the waste drying step. These measures will ensure that there is no significant odour impact at the nearest sensitive receptor.

A.1.6b Control of Emissions to Surface Water

The surface water discharge will consist of uncontaminated runoff rainwater only. In an emergency event of surface water contamination (e.g. uncontrolled spill, fire etc.), contaminated surface water flowing to drain will be held in an underground attenuation tank to prevent the release of pollutants in to the water environment.

The surface water drainage system has been designed to control the emission rate of surface water from the site. The rate of discharge will be controlled and limited by hydrobrake. Excess water during heavy rainfall will be stored in the underground attenuation tank.

All potentially pollutant raw materials stored on-site will be contained in designated areas. Bunding will be provided where necessary to contain unplanned releases from material storage areas, including at the external oil storage tank.

A.1.6c Control of Emissions to Groundwater

The effluent treatment system has been designed in accordance with EPA guidelines and the requirements of Offaly County Council. The design has been agreed to regulate the quantity and quality of treated sanitary effluent discharged to groundwater.

There will be no fugitive emissions to groundwater. Areas where materials are in transit or handled on-site are of hardstanding and any potential spills or releases would be contained in the surface water drainage system. All potentially polluting raw materials will be stored in bunded areas to prevent unplanned releases to drain.

A.1.6d Control of Noise Emissions

The facility has been sited taking account of the surrounding built environment, to avoid proximity to existing residential areas and noise sensitive locations. The nearest noise sensitive location (NSL) is a single dwelling located approximately 350m to the northwest of the site. To minimise noise emissions arising from the process, all main process items of plant will be sited indoors within the main process building. Acoustic enclosures will be installed on items of plant generating significant noise. Since planning approval, new design modifications require the installation externally of a Regenerative Thermal Oxidiser (RTO), emergency generator, transformers, water pump house and roof-mounted condensing units. Based on noise levels measured in the existing noise environment (dominated by N80 traffic), it is not expected these will create a significant additional impact on the noise environment.

There are no equipment items or activities on-site which could generate significant vibration emissions to the external environment.

A.1.7 Monitoring of Emissions

Emissions to the environment will be monitored and sampled in accordance with the requirements of the EPA. This will ensure that the facility and equipment operate as designed and intended.

All monitoring will be recorded and files retained on-site. Subject to grant of waste licence, monitoring results will be reported to the EPA in the format specified by licence conditions.

A.1.7a Air Monitoring & Sampling

The emissions arising from the pyrolysis process will be monitored continuously for the following parameters and any others required by the EPA:

- Oxides of nitrogen (NO_x)
- Sulphur dioxide (SO₂)
- Carbon monoxide (CO)
- Total Organic Carbon (TOC)
- Total dust (particulates)
- Hydrogen chloride (HCl)
- Hydrogen fluoride (HF)
- Oxygen (O₂)
- Temperature

The emissions will be monitored using a Continuous Environmental Monitoring System (CEMS) installed at the main stack, which will relay results to a central computerised control system. The personnel operating the plant will be able to monitor the results. The operation will be set up to automatically and safely shut down in the event of a breach in emission limit set points.

Other pollutant parameters including metals, dioxins and furans will be monitored by taking grab samples on a quarterly basis. This periodic sampling and the associated laboratory analysis will be undertaken by an accredited laboratory.

Spot checks for odour will be carried out weekly at a minimum of two boundary locations, depending on wind direction.

A.1.7b Surface Water Monitoring & Sampling

A monitoring chamber installed at the surface water outfall point at the west of the site will enable continuous monitoring of parameters including flow, temperature, pH, conductivity and TOC.

Sampling and laboratory analysis of surface water in the existing drainage ditches will also be carried out periodically during the construction phase.

A.1.7c Groundwater Monitoring & Sampling

The discharge from the outlet of the effluent treatment system will be monitored at a dedicated sampling chamber. Samples will be taken on a quarterly basis and analysed for levels of biological oxygen demand (BOD), chemical oxygen demand (COD) and total suspended solids (TSS). Sampling and analysis will be undertaken by an accredited laboratory.

Two groundwater monitoring wells have been installed on-site, one upstream and one downstream of the facility. This will allow for the monitoring of ambient groundwater quality in proximity to the licensed activities. It is proposed that samples will be collected monthly and analysed for levels of total organic carbon (TOC), ammonia and conductivity. It is proposed that samples will be analysed for additional parameters once every six months (twice per annum) including pH, nitrate, nitrite, chloride, metals and organohalogenes. The parameters and frequency of ambient groundwater monitoring will be carried out as specified by the EPA. All sampling and analysis will be undertaken by an accredited laboratory.

A.1.7d Noise Monitoring & Sampling

An environmental noise survey will be commissioned annually to measure and assess the daytime and night-time noise levels. Noise levels will be measured at four site boundary locations and at the site boundary of one noise sensitive location (NSL) off-site. All measurements will be reported in accordance with EPA guidelines.

A.1.7e Meteorological Monitoring & Sampling

A meteorological monitoring station will be installed at the facility for the continuous measurement of wind speed, wind direction and atmospheric pressure. Precipitation and temperature will also be measured on a daily basis. It is proposed to locate the weather station, subject to detailed design, on the north-west corner of the roof of the main process building, or an alternative location agreeable to the EPA.

A.1.8 Resource Use & Energy Efficiency

A.1.8a Raw & Ancillary Materials

The pre-treatment (including drying) of waste (65,000tonnes per annum) will generate approximately 50,000tonnes per annum (tpa) of solid recovered fuel (SRF) material through the removal of dry recyclable fractions, non-conforming waste and moisture content. Where significant quantities of waste accepted are dry may increase the quantity of SRF generated. The plant has been sized to treat up to 62,400tonnes per annum of SRF based on 8,000 hours of operation per year.

SRF and energy crop biomass (10,000tpa) will be the materials that ultimately fuel the pyrolysis and gas engine systems.

Within the pyrolysis chamber, the SRF and biomass will be thermally decomposed into a solid material stream of char and gaseous stream of synthetic gas.

The solid char will fuel the secondary cyclonic convertors that provide the heat energy to the pyrolysis chambers. These secondary cyclonic convertors will be initially primed with low sulphur kerosene oil (approximately 6.5tpa). The regenerative thermal oxidiser, associated with the waste drying step, will also be fuelled using low sulphur kerosene oil (approximately 15.4tpa).

Minor quantities of transformer oil, hydraulic oils and lubricants will be used in the operation of plant components (e.g. electricity substation, motor compactors etc.).

Water used in the system, including the syngas cleaning water, will be treated using minor quantities of chemicals including caustic (pH adjustment), sulphuric acid (pH adjustment), monoethylene glycol (water jackets operation) and bromine biocide (water treatment for cooler operation), chlorine dioxide biocide (prevention of Legionella) and sand media (media filtration).

Urea solution/ammonia (SNCR and SCR reagents) will be used in the treatment of flue gas prior to emission to atmosphere.

Activated carbon will be used for cleaning of syngas prior to combustion in the gas engines.

Water will be sourced from connection to the public mains and will be stored on-site in a 1000m³ capacity tank.

A.1.8b Energy Efficiency

The proposed facility will be a net exporter of electricity through (i) combustion of syngas in 3 no. 3.2MW engines (ii) recovery of residual heat energy for production of steam feed to a 1.56MW steam turbine. The plant will generate 11MW electricity of which approximately 9MW will be exported to the National Grid via substation at Clonminch, Tullamore, Co. Offaly.

Energy Efficiency in Design

Specific energy efficient measures incorporated into the design of the facility include:

- Use of char produced by pyrolysis as a fuel source for the system;
- Two stage pyrolysis process which reduces the impact of corrosivity, allowing for maximum energy recovery;
- Use of gas engines to combust gas product derived from pyrolysis (exporting energy to the National Grid);
- Use of excess heat in the gas engine exhaust stream for drying of waste at pre-treatment stage and residual heat recovery via steam turbine to generate electricity;
- Pyrolysis exhaust gas heat recovery via steam turbine to generate electricity.

Operational measures for energy efficiency will include installation of sprung door close devices to reduce heat loss from rooms; lighting control and automation;

electronic document management (scan, email based systems) to minimise the use of photocopiers; office heater control by timer(s) and monitoring of facility energy use.

Energy Efficiency Requirements of Waste Incineration Directive

The facility has been demonstrated to meet the energy efficiency requirements of the Waste Framework Directive under the criteria commonly known as the “R 1 formula”. This R 1 formula provides a standard method of calculating the energy efficiency of plants where waste is used “*principally as a fuel or other means to generate energy*”. The formula and resulting value acceptable for energy efficiency is defined in the Fourth Schedule of the Waste Management Acts 1996 to 2011. For new facilities, the minimum value acceptable using the “R 1 formula” is 0.65. The energy efficiency of the Glanpower facility has been calculated to be 0.84.

High Efficiency CHP

The facility has also been assessed against the requirements of Directive 2004/8/EC on the promotion of cogeneration based on useful heat demand in the internal energy market. In order to qualify as a High Efficiency Combined Heat and Power (CHP) plant, the Glanpower facility must demonstrate primary energy savings (PES) of at least 10% compared with separate production of heat and electricity. This is calculated using a formula defined in the Directive (2004/8/EC). According to this formula, the PES of the proposed facility will be 17.9%.

Glanpower has submitted a ‘High Efficiency Combined Heat and Power’ (HE CHP) application to the Commission for Energy Regulation (CER).

Energy Efficiency Requirement of the Waste Management Acts 1996 to 2011

The facility will be a net exporter of electricity to the National Grid. Low grade heat will be further recovered from the process for drying waste, heating the fuel storage area and generating electricity in a steam turbine.

A.1.9 Materials Handling

A.1.9a Quantity & Nature of Waste

This application seeks consent for the acceptance, pre-treatment and recovery of 65,000tonnes per annum of non-hazardous municipal household and commercial waste as shown in Table A.1.1. As the facility will be subject to market competition, it is not possible to predict at this stage the exact quantities of each waste type.

Table A.1.1: Waste Types Accepted at the Facility

Waste Type	Tonnes Per Annum (proposed)
Household	0 – 65,000
Commercial	0 – 65,000
Sewage Sludge	0
Construction and Demolition	0

Waste Type	Tonnes Per Annum (proposed)
Industrial Non-Hazardous Sludges	0
Industrial Non-Hazardous Solids	0 – 65,000
Hazardous	Not accepted

Waste will be accepted and handled at the site in accordance with site specific procedures.

A.1.9b Waste Arisings

The main waste arising will be 3,200tonnes per annum of inert, vitrified slag material arising from the combustion of pyrolysis-derived char in the secondary cyclonic convertors. The quantity of vitrified slag residue will be minimised by ensuring a consistent level of pre-treatment, monitoring of system temperature and oxygen levels and scheduled maintenance of all plant and equipment. The vitrified slag residue (3,200tonnes per annum or 5% of waste intake) may initially be sent to landfill for disposal, however approval will be sought for use of the product as an aggregate for road building / land cover.

All metals, glass and hard particles in the incoming waste stream will be removed at the pre-treatment stage for off-site recycling. Similarly non-conforming waste items arising in waste consignments (e.g. hazardous materials, WEEE, etc.) will be quarantined for recovery or disposal off-site. The recovery or disposal route will be determined on a case-by-case basis, taking account of the waste hierarchy.

Process residues arising, including scrubber water treatment residues, flue gas treatment residues and waste oils will be reprocessed within the pyrolysis system preventing the requirement for treatment as waste off-site.

Minor quantities of waste arising from the operation of the facility will include office waste, kitchen waste, garden (landscaping) waste, waste electrical and electronic equipment (computers, electrical appliances etc.) Reduction of waste arising will be included as an objective of the site Environmental Management System (EMS) to ensure unnecessary quantities of these waste streams are prevented and that necessary consumption is minimised.

Liquid waste from the emptying of hydrocarbon interceptors will be treated as hazardous waste and processed off-site at a licensed facility for recovery/disposal.

A.1.9c Waste Reuse & Recycling

The facility will include a pre-treatment step to maximise the amount of material which may be separated out of the incoming waste stream for recycling. Heavy particles (including glass, ceramics, stones); metals and waste electrical and electronic equipment will be removed at the pre-treatment stage for recycling off-site.

The facility will assist in improving recycling rates for metal and glass by removing these fractions from mixed municipal waste consignments or “black bin waste”.

A.1.10 Existing Environment & Impact of the Facility

The facility has been designed to ensure that the emissions which will arise from the facility do not have an adverse impact on human health or the environment. A description of the existing environment (air quality, water quality, noise levels, ecology) is included in the Environmental Impact Statement (EIS) included with this application. Further to the impact assessment detailed in the EIS, a summary of the impact of emissions is included below.

A.1.10a Impact of Emissions to Air

Emissions from Pyrolysis

The design of the pyrolysis process and the flue gas treatment technologies selected will ensure that the emissions to air will be compliant with the limit values set under the Waste Incineration Directive (2000/76/EC). This will safeguard against harmful impact to human health or the environment.

Emissions from Gas Engines

The combustion of syngas in the gas engines will cause emissions no higher than those resulting from the burning of natural gas. Accordingly these emissions will not have a harmful impact on air quality.

Odour Emissions

There will be no significant odour impact at the nearest sensitive receptor as a result of the control measures described at Section A.1.6a.

Impact Assessment – Air Dispersion Model

The impact of emissions to air from the facility has been assessed using best practice air dispersion modelling software, AERMOD. Modelling was completed in accordance with EPA guidelines. The model considered the combined impact of facility emissions and existing background concentrations of air pollutants (e.g. oxides of nitrogen, sulphur dioxide etc.).

The air dispersion model was completed initially as part of the Environmental Impact Assessment (EIA) process at planning stage. The model has been revised taking account of the latest design modifications and these results are included as part of this application.

The results of the air quality modelling analysis undertaken indicates that ambient air quality will remain below the relevant air quality standard limits and guidelines values. This has been demonstrated for the worst case scenario of facility operation (i.e. maximum potential emissions).

A.1.10b Impact of Emissions to Surface Water

According to the control measures described at Section A.1.b, there will be no impact on surface water quality. The maximum allowable discharge of surface water runoff will be no greater than the runoff rate from a greenfield site.

A.1.10c Impact of Emissions to Groundwater

The sanitary effluent treatment design and surface water collection system will ensure there is no significant impact on groundwater quality.

A.1.10d Impact of Noise Emissions

The control measures described at Section A.1.6d are designed to minimise noise emissions. The assessment of noise impact has been completed using noise modelling computer software. The noise model was completed initially as part of the Environmental Impact Assessment (EIA) process at planning stage. Additional items of plant have been incorporated in a revised facility design since the grant of planning permission. Based on the existing noise environment and influence of traffic noise from the adjacent N80 national secondary route, it is concluded that noise emissions from the facility will not have a significant impact on the existing noise environment.

There will be no vibration impact arising from the proposed waste activities.

A.1.10e Impact on Ecology

The ecological assessment of the site and surrounding area identified the site land and associated habitats as having relatively low ecological value. The site is not located in proximity to a sensitive habitat or an area designated under conservation legislation (e.g. Special Protection Area, Special Area of Conservation, Natural Habitat Area etc.). A Screening Statement for Appropriate Assessment report was completed in accordance with the requirements of the EU Habitats Directive.

The construction phase (of twelve months duration approx.) has the potential to affect at least one breeding and growing season for most species. Mitigation measures have been identified to minimise the impact of construction and operation phase activities on the ecology features present (e.g. hedgerows, birds etc.). These measures are described in the Environmental Impact Statement (EIS). Examples of these measures include landscaping of the site (with native species); reduced lighting design and maximum retention and maintenance of existing hedgerows.

In summary, there is no negative ecological impact of significance envisaged from the construction or operation of the proposed facility.

A.1.11 Accident Prevention & Emergency Response

Glanpower Ltd. is committed to operating the proposed facility to the highest standards of practice in health and safety, environmental and quality management.

Safety in Design

The facility design is being carried out according to standards, design codes and applicable safety legislation. The design programme includes for EHS Design Review, Hazard and Operability (HAZOP) review and constructability review. The proposed activities are not for the purposes of an establishment to which the European Communities (Control of Major Accident Hazards Involving Dangerous Substances) Regulations 2000 (S.I. No. 74 of 2006) apply.

Critical items of equipment (including pumps, computers, power supply) will be installed on a duty-standby basis or with spare back-up capacity.

Safety in Construction

During the construction phase, the approach to construction safety will be the responsibility of Glanpower in conjunction with its appointed PSDP/PSCS. A Construction Management Plan (CMP) will be implemented on-site to ensure the facility is constructed in a safe and environmentally responsible manner.

Safety in Operation

The facility will be operated under a Safety Statement approved by senior management. A dedicated QEHS Manager will assume overall responsibility for the management of health and safety on-site. Glanpower will apply strict rules on safety such as a Permit to Work System, training of operators and staff and provision and use of personal protection equipment (PPE).

An equipment maintenance schedule will be implemented to ensure that equipment failure is prevented and that any associated incident is avoided.

The monitoring of emissions by GEMS and automatic interlocks on emission set points will ensure that unauthorised emissions are prevented.

Competence

A Human Resources professional will be appointed to oversee the recruitment, qualifications, training, appraisal and development of employees. This is to ensure that the necessary skills and experience are employed on-site for the ongoing protection of employee health and safety as well as environmental protection.

Fire Protection

The fire protection system to be provided at the proposed facility includes for automatic detection, alarm and suppression in accordance with the requirements of Offaly County Council.

Emergency Planning

For operational activities, a Site Emergency Plan will be prepared prior to start-up on-site which sets out the response measures to be taken by personnel in the event of an emergency. The Site Emergency Plan, to be agreed with the EPA, will have four basic components, namely prevention; preparedness; response; recovery.

A.1.12 Remediation, Decommissioning, Restoration & Aftercare

The proposed facility has a projected life span of approximately 20 years, which may be extended through equipment maintenance, upgrades, repairs and/or replacements. An Environmental Liabilities Risk Assessment (ELRA) will be prepared upon commencement of operations to cover potential liabilities arising from the development.

In the unforeseen event of facility closure or cessation of waste activities, Glanpower Ltd. is committed to ensuring that any associated (negative) environmental impact is prevented or minimised to the greatest possible extent. Under a closure/cessation scenario, a Decommissioning Management Plan will be prepared and submitted to the EPA for agreement. This Plan will be informed by the ELRA.

Measures to be implemented upon closure of the facility would include:

- Notification of EPA and local stakeholders;
- Removal of all materials from site;
 - Raw materials returned to supplier, sold onwards or disposed of in accordance with legal requirements and the waste hierarchy;
 - Remaining stock of waste/biomass (fuel) feed processed on-site where possible or alternatively disposed under permit;
 - Petrol interceptors purged (contents transported under permit for disposal at a licensed facility);
 -
- Decommissioning of all plant and equipment under engineering supervision;
- Cleaning, inspection and making secure of facility and site;
- Compilation of handover package including site drawings, documentation and legal records.

If the site is to be permanently vacated, the land will be returned to its current agricultural use.

It is currently envisaged that minimal aftercare provisions will be required as all residual waste items at the site upon closure will be removed for off-site recycling or disposal (in accordance with the waste hierarchy).

A.1.13 Statutory Requirements

The EPA cannot grant a waste licence unless it is satisfied that the conditions outlined in Section 40(4) of the Waste Management Acts 1996 to 2011 have been met. A summary of the compliance with these conditions is included below.

A.1.13a Impact of Facility on Environment and Health

Emissions from the proposed facility will not cause environmental pollution and will not contravene relevant standards, as summarised below.

Operating Standards (General)

The facility has been designed in line with the requirements of BAT, the Waste Incineration Directive (2000/76/EC), architecture and engineering design codes (Eurocodes, British Standards etc.) and monitoring equipment standards prescribed by the EPA. The scope of the detailed design of the facility (ongoing at time of application) includes provision for conformity with health and safety standards (e.g. ATEX requirements, CE Marking, PSDP, PSCS, HAZOP etc.)

Air Emissions & Abatement Air Quality Standards

The Waste Incineration Directive (2000/76/EC) will be applicable to exhaust emissions from the pyrolysis units and associated secondary cyclonic convertors. A flue gas treatment step has been incorporated in the design for the abatement of these emissions. Emissions ultimately discharged from the stack will be below the applicable limits set out in Waste Incineration Directive 2000/76/EC. The cumulative impact of emissions from the facility and existing background air quality will be within Air Quality Standards under the worst case scenario operating conditions.

Effluent Emission Standards

There will be no discharge of trade effluent to surface water or sewer of a sanitary authority. Surface water runoff from areas of hardstanding and building roof areas will drain to an underground surface water network and be discharged centrally via oil interceptors, attenuation tank and hydrobrake to an existing ditch.

There will be a single emission to ground/groundwater, comprising the discharge of sanitary effluent arising from toilets, sinks, kitchen/canteen areas etc. The discharge will be treated by an on-site package wastewater treatment plant (WWTP) and a polishing filter designed in accordance with EPA guidelines.

The facility has been designed to prevent the unauthorised or accidental release of polluting substances to groundwater in accordance with the Groundwater Directive 80/68/EC and Article 8(7) of the Waste Incineration Directive.

Noise Standards

As part of the site selection criteria, the distance from site to neighbouring residences, businesses and other receptors was considered. The nearest noise sensitive location (NSL) is sited a distance of approximately 350m from the proposed facility.

Ecological Standards

A detailed ecological assessment of the facility was completed as part of the EIS, which considered relevant legislation and governing standards including the Wildlife Acts 1976 and 2000, EC Habitats Directive (92/43/EEC) and EC Birds Directive (79/409/EEC), among others.

A screening exercise for Appropriate Assessment was completed for the project (Section 8.8 of the EIS) and it was concluded that there are not likely to be significant effects on any designated (Natura 2000) conservation sites.

Standards for the Management of Residue

In accordance with the Waste Incineration Directive, the system has been designed so that, where practicable, process residues (e.g. syngas scrubbing residues) will be reprocessed within the pyrolysis system. This eliminates the need for their disposal off-site. The vitrified slag residue will initially be sent to landfill for disposal, however approval will be sought for use of the product as an aggregate for road building / land cover. The quantity of waste consigned for disposal to landfill from the facility will be less than 15% of waste intake.

IED Regulation 9(2)(o) Compliance

In accordance with Regulation 9 of the EPA (Industrial Emissions) (Licensing) Regulations 2013 it has been demonstrated in Attachment I.8 Regulation 9 (2) (o) response of 13th March 2013 that the proposed facility have taken suitable measures through assessment, implementation of control, monitoring and prediction modelling to minimise pollution over long distances.

A.1.13b Application of Best Available Techniques (BAT)

The facility has been designed in accordance with Best Available Techniques (BAT), as prescribed in the following documents:

- Reference Document on the Best Available Techniques for Waste Incineration, European Commission, August 1996;
- Batneec Guidance Note for the Waste Sector (Revision 1 – May 1996), EPA;
- BAT Guidance Note on Best Available Techniques for the Waste Sector: Waste Transfer and Materials Recovery, EPA, December 2011.

A.1.13c Compliance with Waste Management Plan

The facility will be located within the area governed by the Waste Management Plan for the Midland Region (WMPMR). The proposed activity is consistent with the objectives of the Waste Management Plan for the Midland Region 2005-2010 (extended to 2014). The grant of planning consent for the proposed development by An Bord Pleanála (planning ref. PL 19.238420) was provided having regard to the Waste Management Plan for the Midlands Region, 2005-2010.

A.1.13d Fit and Proper Person

Neither Glanpower Ltd. nor any Director of Glanpower Ltd. (in their present or previous roles) has been convicted of any offence under environmental legislation. The management and staff of the facility will be suitably qualified and experienced to operate the facility. Personnel will be specifically recruited in the areas of quality, environmental management, health and safety. Organisation structures for both company's senior management and facility management have been devised, in the context of the proposed facility. Staff will receive extensive training in facility operating procedures. Training will be completed in conjunction with equipment suppliers, through formal service/maintenance contracts.

A.1.13e Meeting Financial Commitments & Liabilities

Glanpower is a start-up company. Glanpower Ltd. is fully committed to furnish the EPA with any evidence required to satisfy the Agency of the company's ability to meet any financial commitments or liabilities that will be entered into or incurred in carrying on the activities to which this application relates or in consequence of ceasing to carry out these activities.

Environmental Liabilities Risk Assessment

Prior to commencement of operations it is proposed to carry out an Environmental Liabilities Risk Assessment (ELRA), in accordance with EPA guidelines, to identify the possible requirement(s) for financial provision addressing potential environmental liabilities. This will be submitted to the EPA upon completion.

Insurance

Glanpower Ltd. has been working extensively with the insurance industry to ensure that the facility is fully covered for both construction and operational activities for both public and environmental liabilities. Insurance policies will commence with construction and be advanced for commissioning and overall process operation.

Contingency

In the event of an unforeseen scenario requiring the closure of the facility, Glanpower is committed to ensuring the complete decommissioning and restoration of the site in accordance with a Decommissioning Management Plan for the activities (ref. Section A.1.12). This will be enabled by suitable financial provision to be supported by future operating profit arising from the commercial activities.

A.1.13f Acceptability of Method of Treatment (Environmental Protection)

Pyrolysis is a proven technology, used in the chemical industry to produce charcoal, activated carbon, methanol and other chemicals. Using these principles, the proposed Glanpower facility has been designed as a commercially viable, pyrolytic conversion system that is efficient, environmentally safe and reliable.

The method of treatment assists in the protection of the environment in the following ways: (i) diversion of waste from landfill; (ii) reclamation of recyclable material from residual (black bin) waste by pre-treatment; (iii) renewable energy production as an alternative to fossil fuels, and (iv) reduced environmental impact compared with conventional incineration. Furthermore, the facility is consistent with the requirements of Best Available Techniques (BAT).

A.1.13g Other Statutory Requirements

Other provisions of Section 40(4) of the Waste Management Acts 1996 to 2011 are already addressed in previous sections. These include energy efficiency (Section A.1.8b); control of noise (Section A.1.6d); accident prevention (Section A.1.11); cessation of activity (Section A.1.12).

A.1.13h Waste Hierarchy

Since 2011, the waste hierarchy is embedded in the Waste Management Acts 1996 to 2011. This hierarchy ranks the five main methods of waste treatment in order of preference, specifically (i) prevention; (ii) preparing for re-use; (iii) recycling; (iv) other recovery including energy recovery, and (v) disposal.

The proposed facility will result in moving waste quantities upward from the bottom of the hierarchy (disposal to landfill) to a preferable method of treatment i.e. energy recovery. The inclusion of the pre-treatment step will increase the amount of material recycled, which is a further step upward on the waste hierarchy.

A.1.13i Self Sufficiency and Proximity

The activities will be compliant with the principles of self sufficiency and proximity². The waste capacity of the plant (65,000tpa) has been determined based on the quantities of waste available within the Midlands Region. These quantities are based on EPA published figures and future projections made by the Economic and Social Research Institute (ESRI). The facility is sited centrally within the Midlands Region, with a good standard of road access via the N80 national secondary road route.

A.1.14 Declaration of Application

This application includes the formal, signed declaration of Glanpower Ltd. for the making of an application to the EPA for a Waste Licence.

A.1.15 Glossary of Terms

AERMOD	Atmospheric dispersion modelling computer software
ATEX	Atmosphères Explosives (Explosive Atmospheres)
BOD	Biological Oxygen Demand
CE	Certified Equipment
CEMS	Continuous Environmental Monitoring System
CHP	Combined Heat and Power
CMP	Construction Management Plan
CO	Carbon monoxide
COD	Chemical Oxygen Demand
E, N	Easting and Northing co-ordinates (Irish National Grid)
EC	European Community
EEC	European Economic Community
EHS	Environmental, Health & Safety
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
ELRA	Environmental Liabilities Risk Assessment
ELV	Emission Limit Value
EMS	Environmental Management System

EPA	Environmental Protection Agency
ESB	Electricity Supply Board
ESRI	Economic and Social Research Institute
EU	European Union
ha	Hectare

² Section 37(A) of the Waste Management Acts 1996 to 2011

HAZOP	HAZard and OPerability Study
HCl	Hydrogen Chloride
HE CHP	High Efficiency Combined Heat and Power
HF	Hydrogen Fluoride
HRSG	Heat Recovery Steam Generator
m	metre
m ²	square metre
m ³	cubic metre
MW	MegaWatt
Natura 2000	Conservation sites protected under the EU Birds Directive and EU Habitats Directive
N	North
NO _x	Oxides of nitrogen
NSL	Noise Sensitive Location
O ₂	Oxygen
PES	Primary Energy Savings
PGE	Premier Green Energy Ltd.
pH	Measure of how acidic or basic an aqueous solution is
PPE	Personal Protective Equipment
PSDP	Project Supervisor Design Process
PSCS	Project Supervisor Construction Stage
QEHS	Quality, Environmental, Health & Safety
R1	Recovery code assigned, under European and national waste legislation, to waste recovery facilities meeting a minimum standard of energy efficiency,
REFIT	Renewable Energy Feed-In-Tariff
RTO	Regenerative Thermal Oxidiser
SBR	Sequence Batch Reactor
SCR	Selective Catalytic Reduction
S.I.	Statutory Instrument
SNCR	Selective Non-Catalytic Reduction
SO ₂	Sulphur dioxide
SRF	Solid Recovered Fuel
tpa	tonnes per annum
TOC	Total Organic Carbon
TSS	Total Suspended Solids
TüV	Technischer Überwachungsverein (German Technical Inspection Association)
VOC	Volatile Organic Compounds
WEEE	Waste Electrical and Electronic Equipment
WID EU	Waste Incineration Directive
WMPMR	Waste Management Plan for the Midlands Region

WWTP

Wastewater Treatment Plant

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