ATTACHMENTS

OF WASTE LICENCE REVIEW APPLICATION FOR INTENSIFICATION OF WASTE INTAKE AT KNOCKHARLEY LANDFILL, CO. MEATH

Prepared for:

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December 2008

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User is Responsible for Checking The Revision Status Of This Document

Rev. Nr.	Description of Changes	Prepared by:	Checked by:	Approved by:	Date:
0	Final	AMR	SMA	DOS	22/12/08

Client: Greenstar Ltd

Keywords: Knockharley, landfill, waste licence review application, 400,000 t/a

Abstract: Greenstar is applying to the Environmental Protection Agency for a review of its waste licence (W0146-01) to operate the Knockharley Landfill. The application is for the review of the waste licence to increase the licensed rate of waste acceptance at the site from 200,000 tonnes to 400,000 tonnes per annum for disposal. Save the increase in the volume of waste and an alteration to the landfill phasing sequence, the nature of the activity envisaged is essentially the same as the activity authorised under the existing waste licence. Greenstar has also applied directly to An Bord Pleanala under the provisions of the Strategic Infrastructure Act for planning permission for this proposed development. An environmental impact statement has been prepared in support of both applications. This document comprises the waste licence review application form

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ATTACHMENT A

Non-Technical Summary

NON-TECHNICAL SUMMARY

WASTE LICENCE REVIEW APPLICATION FOR INTENSIFICATION OF WASTE INTAKE AT KNOCKHARLEY LANDFILL, CO. MEATH

Prepared for:

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December 2008

NON-TECHNICAL SUMMARY

WASTE LICENCE REVIEW APPLICATION FOR INTENSIFICATION OF WASTE INTAKE AT KNOCKHARLEY LANDFILL, CO. MEATH

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Client: Greenstar Ltd

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Abstract: Greenstar is applying to the Environmental Protection Agency for a review of its waste licence (W0146-01) to operate the Knockharley Landfill. The application is for the review of the waste licence to increase the licensed rate of waste acceptance at the site from 200,000 tonnes to 400,000 tonnes per annum for disposal. Save the increase in the volume of waste and an alteration to the landfill phasing sequence, the nature of the activity envisaged is essentially the same as the activity authorised under the existing waste licence. Greenstar has also applied directly to An Bord Pleanála under the provisions of the Strategic Infrastructure Act for planning permission for this proposed development. An environmental impact statement has been prepared in support of both applications. This document comprises the non-technical summary.

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PREAMBLE

The contents of an application for a waste licence or the review of a waste licence are prescribed by law in the Waste Management (Licensing) Regulations 2004 (S.I. No. 395 of 2004).

Article 12 (1)(u) of the Regulations requires that the applicant prepares a non-technical summary of the information provided. The regulations also prescribe the subject matter to be addressed in the non-technical summary. The information summarised in this document reflects the requirements of the Regulations.

This application is for the review of the existing waste licence (W0146-01) for Knockharley landfill. The existing licence, issued on March 19th 2003, permits the acceptance of 200,000 tonnes per annum of waste for disposal and recovery. The site also has planning permission which restricts the quantity for disposal to 132,000 tonnes per annum until the end of 2010, reducing to 88,000 tonnes per annum thereafter.

The application is for the review of the waste licence to increase the licensed rate of waste acceptance at the site from 200,000 tonnes to 400,000 tonnes per annum for disposal. Save the increase in the volume of waste and an alteration to the landfill phasing sequence, the nature of the activity envisaged is essentially the same as the activity authorised under the existing waste licence. Greenstar has also applied directly to An Bord Pleanála under the provisions of the Strategic Infrastructure Act for planning permission for this proposed development.

As neither application is for an increase in the overall void capacity, an effect of permission (if granted) would be to significantly shorten the life of the facility.

As is required by European and national law, this application is accompanied by an environmental impact statement (EIS).

The full EIS is available for inspection and can be purchased at the offices of

- An Bord Pleanála, 64, Marlborough Street, Dublin 1.
- The offices of Meath County Council, County Hall, Navan, Co. Meath.
- The offices of the EPA, PO Box 3000, Johnstown Castle Estate, Co. Wexford

NON-TECHNICAL SUMMARY OF APPLICATION

The Applicant

Greenstar Holdings Limited (hereinafter 'Greenstar') is the applicant. Contact details for Greenstar are as follows;.

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The Planning Authority

Meath County Council is the local planning authority however, as prescribed by law, the application for planning permission has been made directly to An Bord Pleanála in accordance with the provisions of the Planning and Development (Strategic Infrastructure Act) 2006., as the proposed development was determined to be strategic development by An Bord Pleanála.

Sewer Discharges

There are no existing or proposed discharges of trade effluent to the sewers. 'Leachate' is the term given to the polluted water that arises when rainwater percolates through the landfilled waste. The landfill is lined, thus the leachate is captured and prevented from discharging to the groundwater. The leachate is pumped on a daily basis to storage before being transported in a road-tanker to an off-site waste water treatment plant.

The Facility Location

The location of the facility is indicated on Drawing WL-A02. Its address is:

- Knockharley Landfill
  Knockharley
  County Meath
  (includes townlands of Tuiterath and Flemingstown).

The facility's National Grid reference is 2975E, 2670N

Description of Proposal

The facility is located on a 135.2 hectare (333 acre) site as presented in Drawing WLA07. The permitted landfill footprint (this term refers to the waste body) is positioned approximately in the centre of the landholding and the current licence permits the development of approximately 25 ha of landfill footprint.

This application proposes to increase the rate of waste deposition to 400,000 tonnes per annum from 2009, and to develop a second active waste deposition area at the northern end of the footprint (moving south). It is not proposed to increase the permitted total quantity of waste to be deposited in the landfill, or to extend the landfill footprint.

The proposed increased rate of waste acceptance entails the filling of the landfill void more rapidly than the current permitted rates thereby enabling earlier closure ad commencement of landfill aftercare. The separate disposal of stabilised waste and other wastes suited for disposal separately to biodegradable waste is also proposed. In operational terms, residual municipal waste will continue to be deposited at the south end of the active void working north. Stabilised wastes will be deposited in a second working face at the north end of the landfill starting at Phase 7 and working south. Both ends of the active void will be worked towards the centre of the void with capping and screening occurring on a phased basis. This second working face is consistent with the company's objective to have proper regard to the protection of the amenity of adjoining property including residential property. It is also consistent with contemporary scientific advice.

The facility was designed, constructed and is being operated in accordance with the EU Landfill Directive. Of particular concern is compliance with the Council Directive 1999/31/EC on the Landfill of Waste.

The Directive sets down criteria with respect to:

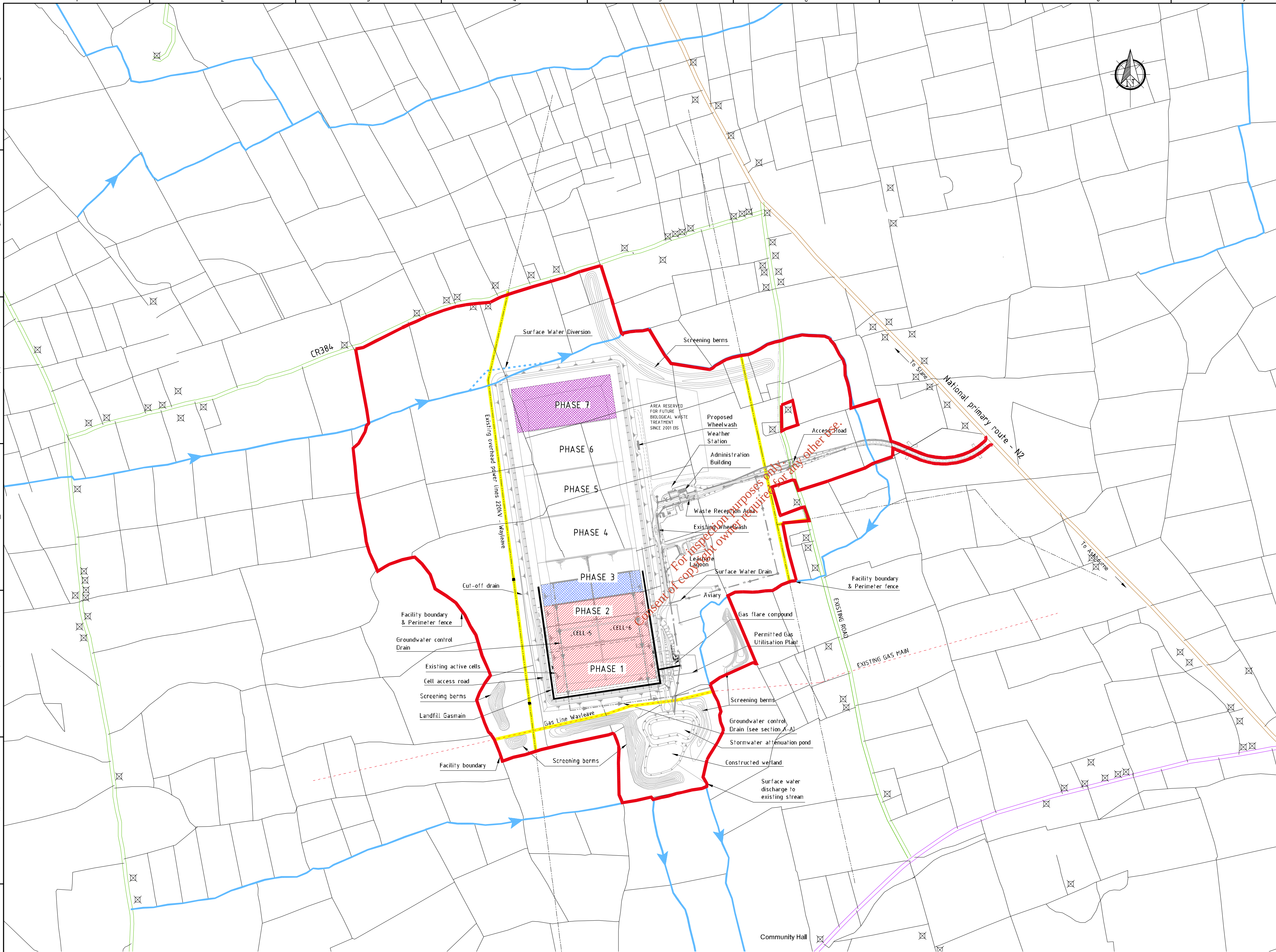
- **Location**. This application does not alter the location or extent of the facility.

- **Water Control and Leachate Management.** The existing water control and leachate management arrangements will remain in place and are adequate to deal with the proposal

- **Protection of Soil and Water.** The fundamental protection is provided by the lining system under the waste. This has been and will continue to be installed under strict quality control and comprises 1 m layer of low-permeability soil together with an artificial liner. A layer of drainage material is placed over the artificial liner that serves both to protect the liner and to efficiently drain the leachate that accumulates up at the base of the landfill.

- **Landfill Gas Control.** Gas cannot seep through the landfill lining system. Landfill gas arises as waste decomposes. As soon as practicable, the landfill is capped (either temporary or permanent) and the trapped gas is routed to a flare. The flare combusts the gas rendering it harmless. In the near future the landfill gas will be utilised as a fuel in a gas-engine that will be used to drive an electricity generator. In addition to the gas flare, there is a network of gas detection monitoring boreholes around the landfill. No evidence of gas migration from the landfill has been detected in the monitoring boreholes.

Sheet FTC-A1-2006 rev. C (template filed in O:\Acad\Templates\Autocad) (May 2007) - template externally referenced



SITE PLAN

Scale 1:10560

NOT FOR CONSTRUCTION UNLESS SPECIFICALLY STATED OTHERWISE

Printing/copying distortions should be checked against scale bar when scaling distances from this drawing.
Use figured dimensions only. If in doubt - Ask!

Legend

- National Primary Routes
- National Regional Routes
- National County Routes
- Application Site Boundary
- Constructed Area
- Area currently Being filled
- Proposed Filling Area
- Existing Water Courses
- Neighbouring Houses
- Overhead Powerlines
- Underground Gas Mains
- Wayleaves

Rev.	Drawn	Chk'd	App'd	Rev Origin / Date	Description
A	JC	SMcA	DOS	Cork 22.12.08	ISSUE FOR REVISION OF WASTE LICENCE

Revision History A

Name of Client

greenstar

Name of Job

KNOCKHARLEY RESIDUAL LANDFILL SITE

Title of Drawing

SITE INFASTRUCTURE

Scales Used 1:10560

This Drawing was printed to A3

Dwg. No. CE07-172-02-FIG-WLA07

Rev. A

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Scale 1:10560

0m 50.0m 100.0m 150.0m 200.0m 250.0m 300.0m 350.0m 400.0m 450.0m 500.0m

ORIGINAL DRAWING SIZE A1 - (841 x 594)

NATURAL SCALE

- **Nuisance and Hazards.** The existing mitigation measures will continue with respect to nuisance control.

  Traffic movement will increase but the existing road infrastructure is capable of handling the traffic safely. When the site was constructed in 2004, a right-turn-lane junction was provided on the N2 as was an underpass to separate local traffic form traffic accessing the site.

- **Stability.** The proposal will not change the side-slopes of the finished waste mound. The side-slopes have been designed for stability. Furthermore, a slope-stability reassessment is undertaken every year.

- **Barriers.** As required by the Directive, the landfill is secured by gates and fences to prevent free access to the site.

Classes of Activity

The Knockharley facility is a landfill for non-hazardous waste. The Regulations define a classification list for waste activities. Tables 1 and 2 list the waste activities for Knockharley Landfill.

Table 1 Relevant Activities in the Third Schedules of the Waste Management Acts 1996 to 2003

THIRD SCHEDULE **Waste Disposal Activities**
1. Deposit on, in or under land (including landfill). This is the primary current waste disposal activity and it will remain so. This activity is further described under Class 5 below.
4. Surface impoundment, including placement of liquid or sludge discards into pits, ponds or lagoons. Leachate is and will continue to be stored in a covered, lined lagoon prior to being either re-circulated or disposed of off site.
5. Specially engineered landfill, including placement into lined discrete cells which are capped and isolated from one another and the environment. (P) This is the principal activity. To date all waste has been disposed of in lined cells. The current proposal is to increase the rate of filling thus lined cells will be developed and filled with waste more rapidly than heretofore.
6. Biological treatment not referred to elsewhere in this Schedule which results in final compounds or mixtures which are disposed of by means of any activity referred to in paragraphs 1 to 5 or paragraphs 7 to 10 of this Schedule. The licensee may, in time, elect to establish a small-scale leachate treatment plant to either augment or replace the current off-site disposal of leachate.
13. Storage prior to submission to any activity referred to in a preceding paragraph of this Schedule Unacceptable waste will continue to be stored in the waste quarantine area pending disposal, treatment or recovery off site.

Table 2 Relevant Activities in the Fourth Schedule of the Waste Management Acts 1996 to 2003

FOURTH SCHEDULE Waste Recovery Activities
2. Recycling or reclamation of organic substances which are not used as solvents (including composting and other biological processes). Compost and other treated organic waste streams used for engineering purposes on the site.
4. Recycling or reclamation of other inorganic materials. Recovered C&D waste is and will continue to be used for engineering purposes such as daily cover or road construction.
9. Use of any waste principally as a fuel or other means to generate energy. Landfill Gas is currently being collected and flared, the licensee proposes to establish gas-fuelled electricity generation as soon as a viable quantity of gas becomes available.
11. Use of waste obtained from any activity referred to in a preceding paragraph of this Schedule. Recovered C&D waste is and will continue to be used for engineering purposes such as daily cover or road construction
13. Storage of waste intended for submission to any activity referred to in a preceding paragraph of this Schedule Again referring to recovered materials to be used for engineering purposes, these will be stockpiled prior to use as needs be.

Quantity and Nature of Waste

The proposed residual waste types comprising the 400,000 tpa include the following;

- Short to medium term disposal of stabilised biowaste from MBT (mechanical biological treatment) processes
- Other stabilised secondary wastes from the processing of non-food-bearing construction, commercial and industrial wastes.
- Soils and rubble and other wastes from the construction industry
- Other residual wastes from the mechanical processing stages of municipal, commercial and industrial waste
- Non-hazardous residual wastes from other waste recovery processes.

It is also proposed to accept up to 10,000 tonnes per annum of construction materials containing asbestos (e.g. water pipes, chimney flues and roof sheeting) (EWC 17 05 06) which are acceptable at non-hazardous landfills for disposal subject to the requirements of Article 6(c)(iii) of the Landfill Directive (1999/31/EC). Such material will be accepted and managed in accordance with the procedures laid down in Section 2.3.3 of the Annex to Council Directive 2003/33/EC.

The proposed quantities of each waste type to be accepted at the site are as follows;

Household & Commercial – 180,000 tpa
Industrial non-hazardous sludges – 10,000 tpa

Industrial non-hazardous solids – up to 150,000 tpa including stabilised by-products of other waste management processes.
Construction & Demolition – 90,000 tpa
Construction materials containing asbestos – 10,000 tpa
Inert materials imported for restoration purposes – no limit where used in landfill engineering.

Although the indicative tonnages presented above add up to more than 400,000 tonnes, no more than 400,000 tonnes will be accepted in a single year.

Raw Materials, Ancillary Materials, Fuels Etc

The primary materials used in the facility are

- landfill lining materials comprising:
  - Clay – won on site
  - HDPE liner – imported
  - Protective geotextile – imported
  - HDPE pipework – imported
  - Granular drainage material – imported
- daily cover material
  - Permeable soil – won on site
  - Fine soils – recovered from selected waste deliveries
  - Woodchip – odour abatement layer recovered from waste timber and placed over the daily cover
- capping material
  - Low-pemeability soils – won on site
  - LLDPE membrane – imported
  - Topsoil – won on site
- Gas collection pipework – imported

Electrical energy is used to power pumps, lighting and the administration building; Most of the plant is diesel powered; and petrol is used for small portable plant. The amount used in 2007 was as follows:

Table 3 – 2007 Energy Consumption

PARAMETER	UNITS	2007
Electricity	(kWh)	137,400
Diesel Oil	(Litres)	153,773
Petrol	(Litres)	120
Hydraulic engine oil	(litres)	131
Odour neutralizers*	Litres	1,875

*Clean Air 400 mixed with water is used as an odour neutralizer

Greenstar is currently moving towards utilisation of LFG for electricity generation. It is envisaged that electricity generation will commence in 2009. Greenstar has planning permission to install the necessary equipment but a grid connection is awaited. The plant will be capable of generating 4.2W of electricity.

Plant, methods and Processes

The facility operation is presented in Drawing WLA07 which illustrates the layout of the site with the landfill phases numbered.

The landfill comprises seven phases of four cells (i.e. 28 cells) all lined in accordance with the EU Council Directive on the Landfill of Waste.

All waste is delivered to the site in heavy goods vehicles (HGV) provided with the appropriate covers to prevent loss of load. Each vehicle first proceeds to the incoming weighbridge where it is weighed. The weighbridge operator and/or the facility manager may, at their own discretion, request the load to be tipped in the waste inspection area. The vehicles then proceed to the active waste disposal area, where waste is deposited under the direction of a banksman. The vehicles weigh out at the outgoing weighbridge and receive an individual weighbridge docket before exiting the site.

Each landfill cell is divided into a number of 'grids', which are used to identify the areas where waste is deposited. Each load is assigned the relevant grid number.

Cells are developed in 'phases'. Up until now, waste has been deposited sequentially in the order that the cells/phases are numbered, commencing at the southern end and moving north. The current extent of development is that 10 of 28 cells are constructed. The proposal is that a second face would be opened commencing at Phase 7 with development and filling following the reverse-order of cell numbering, i.e. 28,27,26, etc.

Waste is and will be deposited close to and above the advancing tipping face. The active face is confined to a height of 2.5 m after compaction, a width of 25 m and a slope no greater than 1 in 3. Deposited waste is spread in shallow layers on the inclined surface and compacted. The steel-wheeled compactors operate on the gradient of the more shallow face, pushing thin layers of waste and applying compaction pressure to them. For the proposal, a second compactor would operate at the 'northern' face.

The site operatives inspect the deposited waste for items that are not acceptable under the Waste Licence, such as tyres, gas bottles, batteries etc. These are removed and stored in appropriate areas for later removal from the site.

Each day's waste input is deposited to form a 'block', which is compacted and covered. The following day a new 'block' of waste is deposited adjacent to this block. This ordered method of waste deposition enables areas which have been filled to be progressively restored over the site life, minimising the areas of active waste deposition.

Landfill gas is captured using a combination of vertical and near-horizontal pipework and is currently flared at an enclosed landfill gas flare that commenced operation in December 2006. Planning permission was granted in April 2007 for installation and

operation of a gas utilisation plant. The proposed plant will be phased and will generate up to 4.2MW of electricity for input into the national grid. Greenstar is awaiting connection to the national grid and it is envisaged that the first gas engine will be installed and operational in 2009 pending the grid connection. The landfill gas will continue to be flared until such time as a connection is established by the ESB.

The effect of fugitive gas emissions is mitigated using odour neutralisers as well as the use of daily cover in accordance with the provisions of the waste licence. Daily cover comprises a minimum of 150 mm soil-like material covered with a 100 mm deep layer of woodchip, the latter being a well documented medium used to treat odourous compounds in bio-filters. Before being covered the waste is compacted. The immediate compaction of the waste within a small controlled area serves to minimise the available area for odours to escape from the daily tipping area. The progressive development of the landfill gas collection and treatment infrastructure enhances odour control as landfill gas combustion effectively destroys its odourous compounds. A high density of landfill gas extraction points have been installed at the landfill that are connected to modern state-of-the-art gas flares. A gas-engine and generator will be installed at the site in the near future to utilise the gas.

Leachate is contained by the lining system and systematically pumped to the fully-lined and covered leachate lagoon. Leachate is removed regularly by a licensed waste contractor to a wastewater treatment plant, thus minimising the potential for odours which can form as a result of leachate stagnating and becoming anaerobic.

When permitted by the EPA, leachate may be re-circulated into the waste body (under the cap) so as to accelerate stabilisation of the waste mass.

On completion of landfilling, both leachate and landfill gas management will continue until it is deemed by the EPA that the landfill no-longer poses a significant risk to the environment.

Outside of the landfill footprint, surface water is directed to a lagoon before being discharged to the adjacent stream via a constructed wetland. In the event that significant surface water contamination occurs, continuously active monitoring equipment will close the lagoon discharge to prevent a pollution event.

Ultimately, the entire waste mass will be covered and re-vegetated. The intensification of waste intake will not alter the final landform when compared with the current permitted development. Clearly, with this proposal, the final landform will be achieved sooner and this is seen as a positive impact. The development of the landfill to date has included the construction of berms and the planting of trees that are designed to limit the visual intrusion of the landfill within the local landscape.

The site's administration is housed in a dedicated office block and a weighbridge kiosk.

Other relevant infrastructure includes

- Fencing and security gates
- Paved and un-paved roads
- Diesel bund
- Maintenance shed
- Weather station
- Aviary

- Back-up generator
- Environmental monitoring and control infrastructure
- Screening bunds
- Screening planting

Compliance With Paragraphs (a) to (g) of Section 40 of the Act

This section of the Waste Management Act is concerned with the emissions from the site, environmental pollution, compliance with the Landfill Directive, conformity with waste management planning, use of best available techniques, the fitness of the applicant to hold a licence and financial provision.

Knockharley Landfill is designed, constructed, operated, monitored and will be restored in accordance with European Council Directive 1999/31/EC, the EPA Landfill Manuals, BAT guidance notes for waste facilities, the waste licence for the site, and with any other relevant environmental standards.

Being a fully lined landfill there is negligible risk that leachate or landfill gas will discharge to any environmental medium. This is borne out by the results of environmental monitoring undertaken in accordance with the conditions of the licence and reported to the Agency on an annual basis.

There has been no exceedance since the site opened. Intensification could increase the risk of noise exceedance however modelling has demonstrated that the licence limits will not be exceeded. Other emissions such as leachate and gas have similarly been modelled with no adverse impact predicted.

The existing landfill as operated by Greenstar in accordance with the conditions attached to the Waste Licence has not caused environmental pollution. This is confirmed by the regular monitoring undertaken in compliance with the licensed schedules of the licence. The EPA has audited the Knockharley landfill site on four separate occasions with no non-compliances noted making it the most compliant landfill in the country.

The EPA has published best available techniques (BAT) guidance for landfill. BAT guidance covers issues such as site location, facility design, facility management, waste acceptance, emissions, monitoring and closure/aftercare. Greenstar has employed BAT in all aspects of the facility. In many cases, the techniques used by Greenstar exceed the standard set down in BAT.

In making this proposal, the existing monitoring regime will continue. The only change is that because cells will develop more quickly, monitoring points will be brought on line sooner. As is demonstrated by leachate balance calculations, the overall quantity and hence the overall risk of leachate pollution, will reduce. As final capping will occur sooner, maximum-efficiency LFG capture (and utilisation/treatment) will commence sooner.

The site selection, its design and operation have and will be compliant with all provisions of the Landfill Directive.

Greenstar is the incumbent licensee for Knockharley and fifteen other facilities (as well as for a large number of waste permits). Greenstar has in all instances, demonstrated its fitness in compliance with the Act. The proposal does not include any activities or responsibilities that fall outside of Greenstar's normal remit.

Modelling has demonstrated that the intensified activity will not breach any noise standard.

The site has a well documented accident prevention plan coupled with an emergency response procedure.

After landfilling ceases, the site will be managed in accordance with its documented aftercare management plan.

Greenstar has discharged all of its financial responsibilities with respect to the site as is required by section 53 of the Waste Management Act.

Emissions from the Activity

The effect of emissions from the existing operation is monitored as per the existing licence. Monitoring is reported to the EPA in the site's annual environmental report (AER). Emission points are shown on Drawing WLA11.

Atmospheric Emissions: Dust – while there is a potential for increased dust due to traffic and construction, the same rigorous application of suppression by water-spray will prevent any increase in emission. As witnessed by the annual monitoring results the existing dust emission has not given rise to any breach of the licensed standard.

Landfill gas flare – the intensification of waste intake will not increase the overall quantity of landfill gas, it will however increase and advance the peak production. The flare/gas engines will continue to combust the harmful gas and trace compounds, as at present.

General odour emission – while there will be a second working face, the type of waste placed at the northern face will have little potential for odour generation. Greenstar will continue to employ best practice to minimise the risk that significant odours will be detectable in the vicinity of the site.

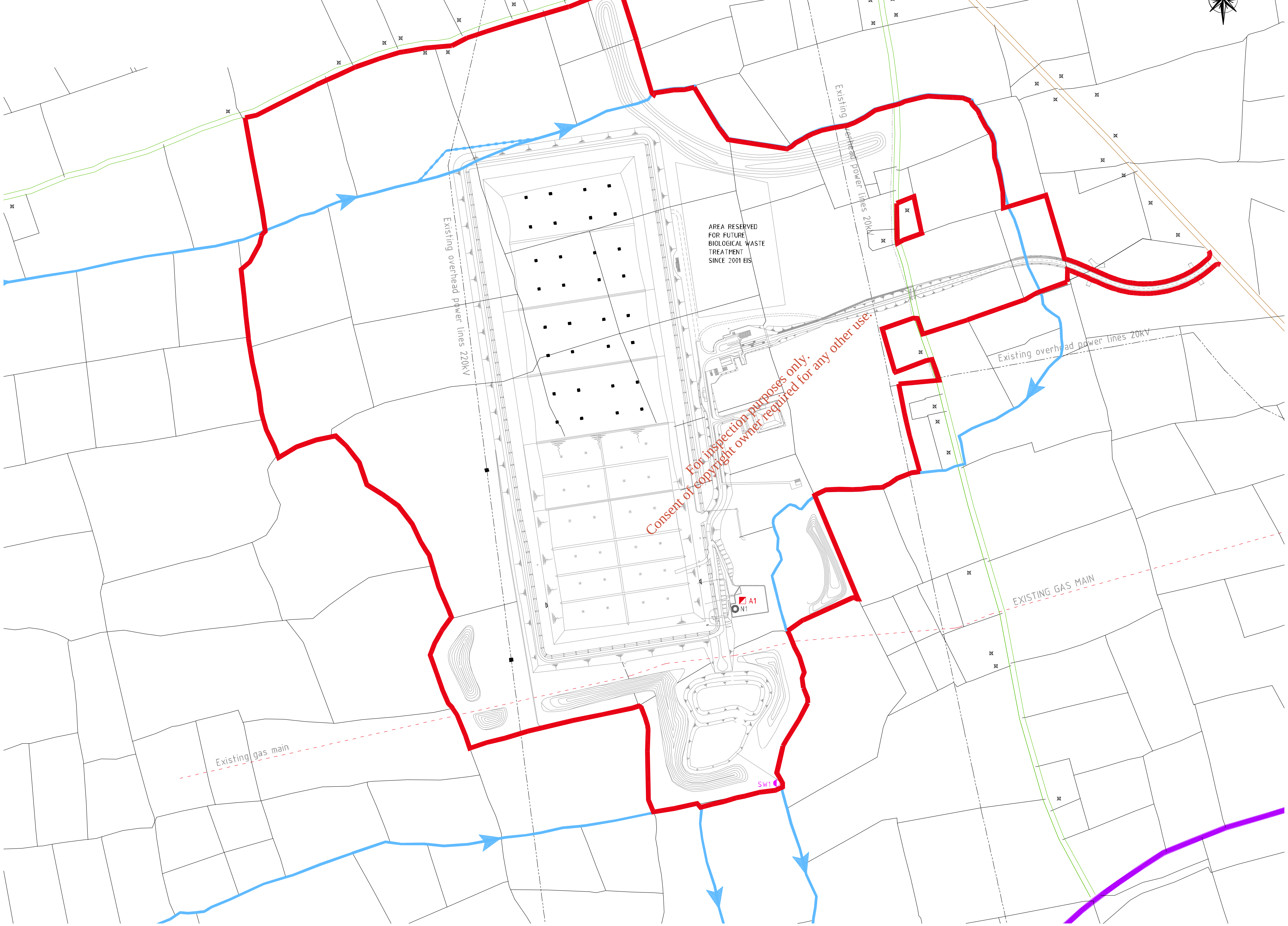
Emissions to Surface Waters: All surface water generated on site will, as at present be routed to the surface water attenuation pond. The intensification will not increase the size of the facility nor will it increase the catchment served by the surface water management system.

Emissions to Sewer: There are no emissions to sewer. Sewage is treated on site and the treated effluent is discharged to the leachate lagoon.

Emissions to Groundwater: There are no emissions to groundwater due to use of cell lining system which prevents escape of leachate to ground or groundwater. There are no percolation areas (the discharge from the site's WWTP is exported as leachate).

EMISSIONS LOCATIONS

POINT	EASTING	NORTHING
N1	297569	266894
SW1	297653	266570
A1	297589	266910



SITE PLAN

Scale 1:7500

Scale 1:7500

Legend:

- National Primary Routes
- National Regional Routes
- National County Routes
- Application Site Boundary
- Existing Water Courses
- Denotes Landfill Gas Emission Location (P Denotes Proposed Emission Location)
- Denotes Surfacewater Emission Location (P Denotes Proposed Emission Location)
- Denotes Noise Emission Location
- Existing Passive Gas Vent
- Proposed Passive Gas Vent
- Overhead Powerlines
- Underground Gas Mains

Rev.	Drawn	Chk'd	App'd	Rev Origin / Date	Description
A	JC	SMcA	DOS	Cork 22.12.08	ISSUE FOR REVISION OF WASTE LICENCE

Revision History A

Name of Client

greenstar

Name of Job

KNOCKHARLEY RESIDUAL LANDFILL SITE

Title of Drawing

EMISSIONS POINTS LOCATIONS

Scales Used: Scale 1:7500

This Drawing was printed to A3

Dwg. No. CE07-172-02-FIG-WLA11

Rev. A

O:\ACAD\2007\CE07\172\02\CE0717202_Figwla11

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Noise: Extra waste deliveries and extra waste-placement machinery will give rise to increased noise. However, modelling has demonstrated that noise levels form the site will remain in compliance with the licence

Leachate: Leachate will arise from the activity. As at present, it will be contained by the lining system, collected and stored before being transported off site for safe disposal. The quantity of leachate generated is dependent on the length of time that the landfill remains open. The proposal will reduce the overall quantity of leachate being produced. To date the nature of leachate has been consistent with what is to be expected form a non-hazardous landfill. As the nature of waste changes in the future, the nature of the leachate will also change resulting in a lower pollutant load.

Effects of Emissions

The intensification of waste intake will have a slight effect on the nature and extent of landfill gas generation. The overall quantity of gas generated will not increase but the peak generation will be advanced. However the abatement (flare, gas engines and daily cover) will continue to mitigate the effect.

Monitoring to date has demonstrated that the facility has had no adverse impact on surface water. There will be no change in the impact to the surrounding streams as a result of the intensification of waste intake. In fact the existence of the pond and wetland comprise the only engineered control in the local stream catchment.

There are no emissions or risk to ground/groundwater either currently or proposed as a result of the intensification of waste intake. The intensification does not require that the formation levels be lowered thus there will continue to be no risk to groundwater. There is no evidence or history of groundwater contamination at the site.

The intensification will lead to a slight increase in noise from waste deliveries and mobile plant and construction activities but this will not result in exceedance of limits specified in the waste licence.

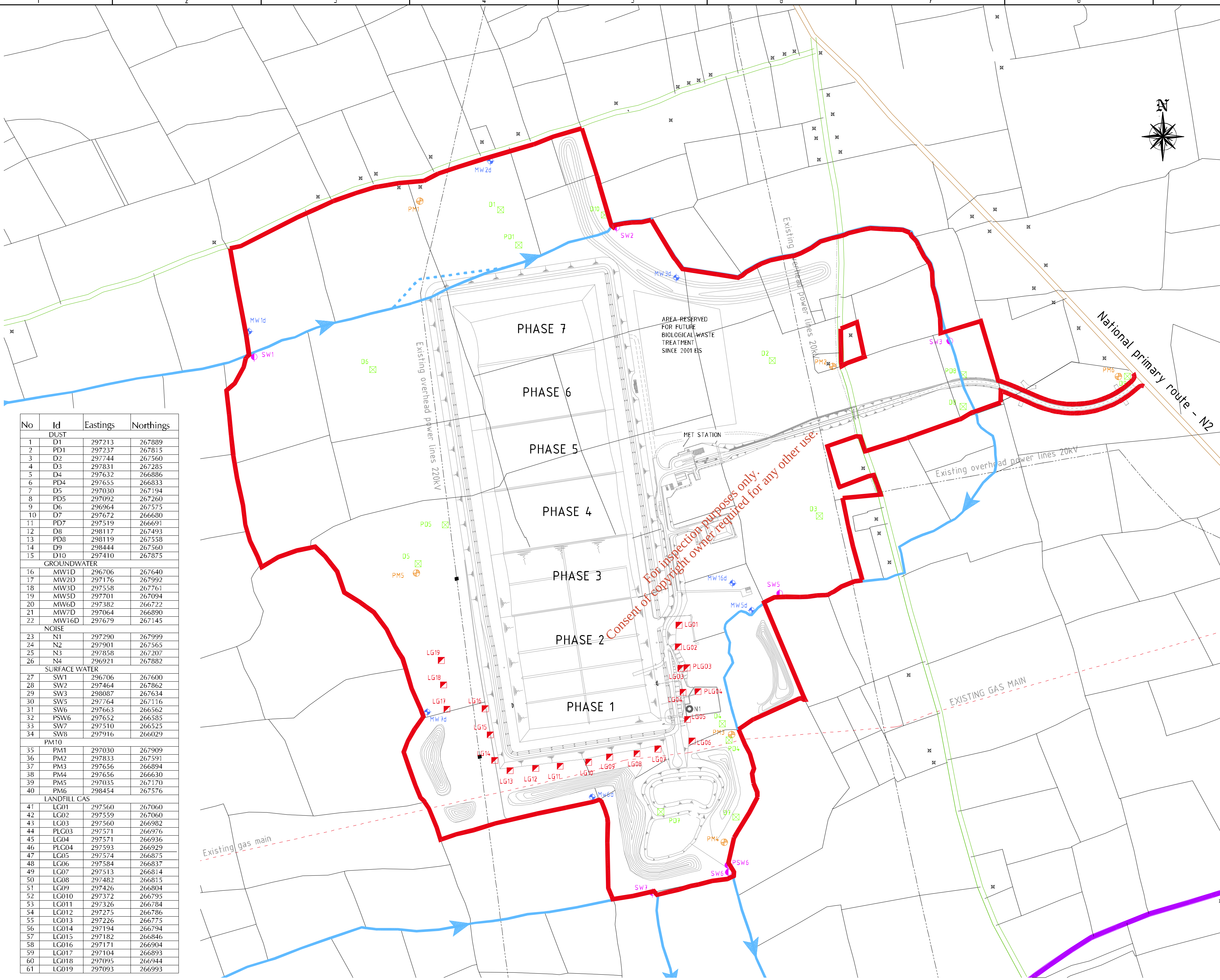
Monitoring and Sampling Points

The existing licence prescribes monitoring points for the site's emissions. These are shown on Drawing WLA12. As there is no proposal to increase the size of the facility, there is no perceived need to increase the number of sampling locations. The licence also prescribes a frequency for sampling and analysis that should not require any modifications. The proposal does not warrant any change in the frequency of monitoring.

Waste Arising

Leachate and landfill gas (fully described in Attachments D4 and D5) are the principal wastes arising on site. Office use and construction gives rise to a small quantity of

'domestic' waste. All such wastes are source segregated and sent off site for processing with the residual fraction being landfilled.



No	Id	Eastings	Northings
	DUST		
1	D1	297213	267889
2	PD1	297237	267815
3	D2	297744	267560
4	D3	297831	267285
5	D4	297632	266886
6	PD4	297655	266833
7	D5	297030	267194
8	PD5	297092	267260
9	D6	296964	267575
10	D7	297672	266680
11	PD7	297519	266691
12	D8	298117	267493
13	PD8	298119	267558
14	D9	298444	267560
15	D10	297410	267875
	GROUNDWATER		
16	MW1D	296706	267640
17	MW2D	297176	267992
18	MW3D	297558	267761
19	MW5D	297701	267094
20	MW6D	297382	266722
21	MW7D	297064	266890
22	MW16D	297679	267145
	NOISE		
23	N1	297290	267999
24	N2	297901	267565
25	N3	297858	267207
26	N4	296921	267882
	SURFACE WATER		
27	SW1	296706	267600
28	SW2	297464	267862
29	SW3	298087	267634
30	SW5	297764	267116
31	SW6	297663	266562
32	PSW6	297652	266585
33	SW7	297510	266525
34	SW8	297916	266029
	PM10		
35	PM1	297030	267909
36	PM2	297833	267591
37	PM3	297656	266894
38	PM4	297656	266630
39	PM5	297035	267170
40	PM6	298454	267576
	LANDFILL GAS		
41	LG01	297560	267060
42	LG02	297559	267060
43	LG03	297560	266982
44	PLG03	297571	266976
45	LG04	297571	266936
46	PLG04	297593	266929
47	LG05	297574	266875
48	LG06	297584	266837
49	LG07	297513	266814
50	LG08	297482	266815
51	LG09	297426	266804
52	LG010	297372	266795
53	LG011	297326	266784
54	LG012	297275	266786
55	LG013	297226	266775
56	LG014	297194	266794
57	LG015	297182	266846
58	LG016	297171	266904
59	LG017	297104	266893
60	LG018	297095	266944
61	LG019	297093	266993

0m 75.00m 150.00m 225.00m 300.00m 375.00m

Scale 1:7500

SITE PLAN

Scale 1:7500

NOT FOR CONSTRUCTION UNLESS SPECIFICALLY STATED OTHERWISE

Printing/Copying distortion should be checked against scale bar when scaling distances from this drawing.

Use figured dimensions only. If in doubt - Ask!

Legend:

- Denotes Landfill Gas Emmission Location (P Denotes Proposed Emmission Location)
- Denotes Groundwater Monitoring Location
- Denotes Surfacewater Emmission Location (P Denotes Proposed Emmission Location)
- Denotes Noise Monitoring Location
- Denotes Dust Monitoring Location (P Denotes Proposed Monitoring Location Operational from July 2006)
- Denotes PM10 Monitoring Location
- National Primary Routes
- National Regional Routes
- National County Routes
- Application Site Boundary
- Existing Water Courses
- Overhead Powerlines
- Underground Gas Mains

Rev.	Drawn	Chk'd	App'd	Rev Origin / Date	Description
A	JC	SMcA	DO'S	Cork 22.12.08	ISSUE FOR REVISION OF WASTE LICENCE

Revision History A

Name of Client

greenstar

Name of Job

KNOCKHARLEY RESIDUAL LANDFILL SITE

Title of Drawing

MONITORING POINTS LOCATIONS

Scales Used: Scale 1:7500

This Drawing was printed to A3

Dwg. No.: CE07-172-02-FIG-WLA12 — Rev.: A

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The proposed intensification of waste intake will not increase leachate arisings. It will not increase the overall volume of gas however the peak generation will occur sooner. There will be a slight increase in 'domestic' waste associated with extra employees.

Off-site Treatment of Wastes

Only leachate is treated off-site. It is transported by road tanker to a waste water treatment plant (currently Navan Sewage Treatment Plant). The proposal does not warrant any change from the current arrangement.

Measures to Prevent Unauthorised Emissions

Procedures for accident prevention and Emergency Preparedness and Response have been developed for Knockharley Landfill. These policies reflect the requirements of the licence and of the EPA guidance documents with respect to measures to prevent unauthorised emissions. The policies are reviewed annually and when deemed necessary.

Closure Restoration and Aftercare

A restoration and aftercare plan for the facility has been approved by the Agency. The site will be closed by establishing an engineered cap. The intensification does not bring any change other than advancing the date when the waste will be capped and vegetated. Aftercare including leachate and gas management will continue until monitoring results indicate that it is no longer warranted.

Financial Provision

Greenstar is in a position to meet any financial commitments or liabilities that the Agency reasonably considers will be entered into or incurred by it in carrying out the activity to which the application relates or in consequence of ceasing to carry out that activity.

Condition 12 of the current licence requires Greenstar to arrange for the completion, by an independent and appropriately qualified consultant, of an Environmental Liabilities Risk Assessment (ELRA). The ELRA for Knockharley Landfill was submitted to the Agency in accordance with the licence conditions and includes a proposal for financial provision arising from the carrying of activities to which the licence relates. Currently Greenstar has financial and insurance provision in place to the satisfaction of the Agency.

Major Accident Hazardous and Discharges to Aquifers

These aspects of the Regulations do not apply to the facility because it is a non-hazardous landfill.

Discharges to Aquifers

The lining system at the landfill meets and exceeds the requirements of the landfill directive with respect to groundwater protection. The protection includes both the lining system and the existence of a thick layer of low-permeability soil between it and the aquifer. This protection combined with the fact that this is a non-hazardous landfill demonstrates compliance with Council Directive 80/68/EEC of 17 December 1979 on the protection of groundwater against pollution caused by certain dangerous substances.

ATTACHMENT B

General

ATTACHMENT B.1

Applicant Details

ATTACHMENT B.1 APPLICANT DETAILS

(a) a Certified Copy of the Certificate of Incorporation or Memorandum and Article of Association;

The Certificate of Incorporation is attached overleaf.

(b) the Company's Registration Number from the Companies Registry Office

295816

(c) List of the Company Directors.

Mike Wynne, Jim Barry, Michael Walsh, John Dixon, Geoff Bailey, Jerry Dempsey, Eamonn Medley, Lisa Birthistle (E Bolger Secretary)

The site ownership plan in 1:10,560 scale is appended as Drawing WLA01.

Number 295816

Certificate of Incorporation on change of name

I hereby certify that

GREENSTAR LIMITED

having, by a Special Resolution of the Company, and with the approval of the Minister for Enterprise, Trade and Employment, changed its name, is now incorporated as a limited company under the name

GREENSTAR HOLDINGS LIMITED

and I have entered such name on the Register accordingly.

Given under my hand at Dublin, this

Wednesday, the 28th day of April, 2004

for Registrar of Companies

Number 295816

Certificate of Incorporation on change of name

I hereby certify that

GREENSTAR RECYCLING HOLDINGS LIMITED

having, by a Special Resolution of the Company, and with the approval of the Minister for Enterprise, Trade and Employment, changed its name, is now incorporated as a limited company under the name

GREENSTAR LIMITED

and I have entered such name on the Register accordingly.

Given under my hand at Dublin, this

Monday, the 1st day of March, 2004

for Registrar of Companies

Number 295816

Certificate of Incorporation on change of name

I hereby certify that

CELTIC WASTE LIMITED

having, by a Special Resolution of the Company, and with the approval of the Minister for Enterprise, Trade and Employment, changed its name, is now incorporated as a limited company under the name

GREENSTAR RECYCLING HOLDINGS LIMITED

and I have entered such name on the Register accordingly.

Given under my hand at Dublin, this

Friday, the 7th day of March, 2003

for Registrar of Companies

Duplicate Certificate

DUPLICATE FEE PAID CERTIFICATE

Number :295816

Certificate of Incorporation of a Company

I hereby certify, that

CELTIC WASTE LIMITED

was Incorporated under the Companies Acts, 1963 to 1990
as a Limited Company, on the
Wednesday, the 4th day of November, 1998.

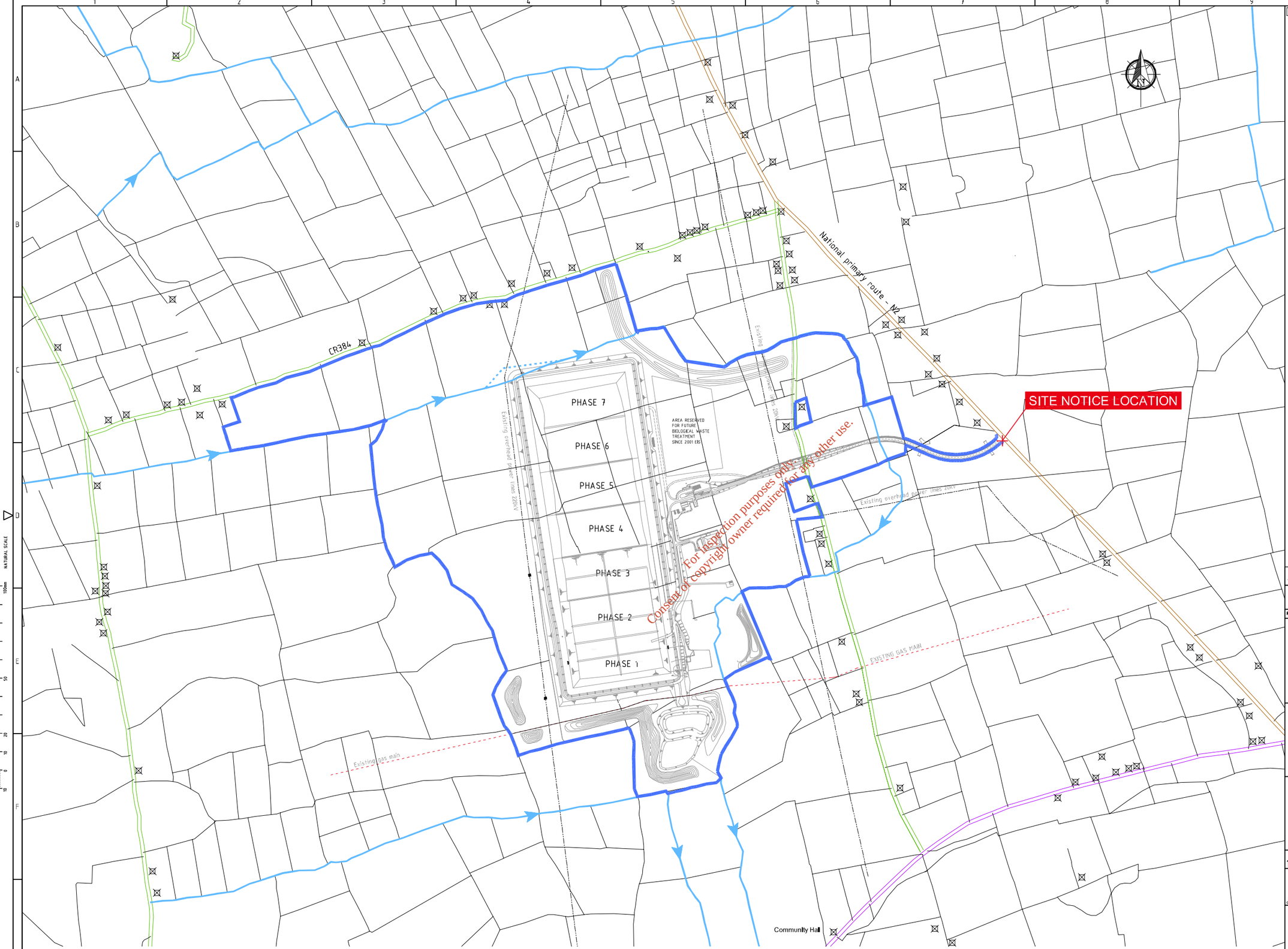
Given under my hand at Dublin, this
Thursday, the 21st day of December, 2000.

Registrar of Companies

Companies Act, 1963, sec. 370(1)

Legend

- Ownership Boundary
- National Primary Routes
- National Regional Routes
- National County Routes
- Existing Water Courses
- Houses
- Overhead Powerlines
- Underground Gas Main



SITE PLAN
Scale 1:10560

0m 50.0m 100.0m 150.0m 200.0m 250.0m 300.0m 350.0m 400.0m 450.0m 500.0m
Scale 1:10560

Rev.	Drawn	Chkd	Appd	Date	Description
A	JC	SMcA	DOS	Cork 22.12.08	ISSUE FOR REVISION OF WASTE LICENCE

Revision History: A

Name of Client: greenstar

Name of Job: KNOCKHARLEY RESIDUAL LANDFILL SITE

Title of Drawing: SITE OWNERSHIP PLAN 1:10560 SCALE

Scales Used: 1:10560
This Drawing was printed to A3

Dwg. No.: CE07-172-02-FIG-WLA01
Rev.: A

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ORIGINAL DRAWING SIZE A1 - (841 x 594)
NATURAL SCALE

ATTACHMENT B.2

Location of Activity

ATTACHMENT B.2 LOCATION OF ACTIVITY

The National Grid Reference of the subject site is, 2975E, 2670N
The location of the activity is presented in Drawing WLA02.

(a) A Site Plan is presented in Drawing WLA03 at 1:10,560 scale.

(b) A Site Location Map showing 500m boundary offset is presented in Drawing WLA04 at 1:10560 scale

(c) Site Services Plans are presented in Drawings WLA05 to WLA06

N 268600

E-295700

N 268600

E-299200

Legend

- National Primary Routes
- National Regional Routes
- National County Routes
- Application Site Boundary
- Existing Water Courses
- Neighbouring Houses
- Overhead Powerlines
- Underground Gas Mains

CR384

National primary route - M2

To Slane

To Ashbourne

Existing overhead power lines 20kV

PHASE 7

PHASE 6

PHASE 5

PHASE 4

PHASE 3

PHASE 2

PHASE 1

AREA RESERVED FOR FUTURE BIOLOGICAL WASTE TREATMENT SINCE 2001 EIS

SITE NOTICE LOCATION

EXISTING GAS MAIN

Existing gas main

Community Hall

SITE PLAN
Scale 1:10560

0m 50.0m 100.0m 150.0m 200.0m 250.0m 300.0m 350.0m 400.0m 450.0m 500.0m
Scale 1:10560

Rev.	Drawn	Chkd	Appd	Date	Description
A	JC	SMcA	DOS	Cork 22.12.08	ISSUE FOR REVISION OF WASTE LICENCE

Revision History: A

Name of Client: greenstar

Name of Job: KNOCKHARLEY RESIDUAL LANDFILL SITE

Title of Drawing: SITE PLAN SCALE 1:10560

Scales Used: 1:10560

This Drawing was printed to A3

Dwg. No.: CE07-172-02-FIG-WLA-03

Rev.: A

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ORIGINAL DRAWING SIZE A1 - (841 x 594)

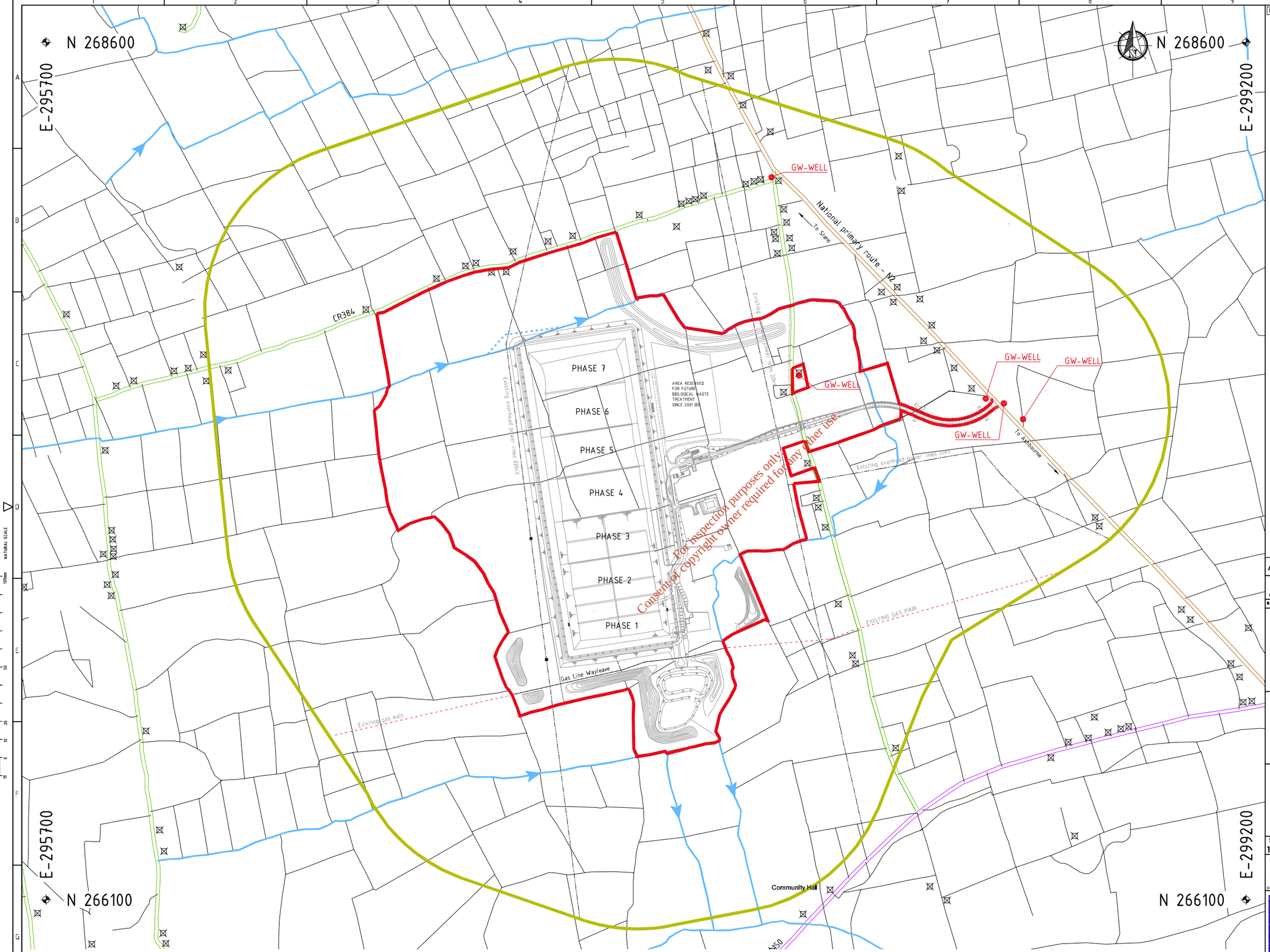
NATURAL SCALE 10 0 10 20 50 100mm

N 268600

E-295700

E-299200

N 266100



SITE PLAN

Scale 1:10560

Scale 1:10560

Legend

- National Primary Routes
- National Regional Routes
- National County Routes
- Application Site Boundary
- Existing Water Courses
- Neighbouring Houses
- Overhead Powerlines
- Underground Gas Mains
- 500m Boundary Offset
- GW-WELL — Ground Water Wells

Rev.	Drawn	Chk'd	App'd	Rev Origin	Description
A	JC	SMcA	DOS	Cork 22.12.08	ISSUE FOR REVISION OF WASTE LICENCE
Revision History	A			Date	

Name of Client

greenstar

Name of Job

KNOCKHARLEY RESIDUAL LANDFILL SITE

Title of Drawing

SITE LOCATION MAP
SHOWING 500m BOUNDARY OFFSET

Scales Used	This Drawing was printed to
1:10560	A3

Dwg. No.	Rev.
CE07-172-02-FIG-WLA-04	A

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ORIGINAL DRAWING SIZE A1 - (841 x 594)

NATURAL SCALE

N 268600

E-295700

E-299200

N 266100

GW-WELL

CR384

PHASE 7

PHASE 6

PHASE 5

PHASE 4

PHASE 3

PHASE 2

PHASE 1

AREA RESERVED FOR FUTURE BIOLOGICAL WASTE TREATMENT SINCE 2001 EIS

Existing overhead power lines 20kV

National primary route - N9

WATER MAIN

EXISTING GAS MAIN

SURFACE WATER DRAINAGE

Existing gas main

Community Hall

Refer to WLA06 For Further Detail of This Area

SITE PLAN

Scale 1:10560

0m 50.0m 100.0m 150.0m 200.0m 250.0m 300.0m 350.0m 400.0m 450.0m 500.0m

Scale 1:10560

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2440,2441,2442,2508,2509,2510,2577A,2577B,2578A,2578B,2579A

Legend

- National Primary Routes
- National Regional Routes
- National County Routes
- Application Site Boundary
- 250m Boundary Offset
- Existing Water Courses
- Neighbouring Houses
- Overhead Powerlines
- Underground Gas Mains
- Existing Watermain
- GW-WELL Ground Water Wells

Rev.	Drawn	Chk'd	Appr'd	Date	Description
A	JC	SMcA	DOS	Cork 22.12.08	ISSUE FOR REVISION OF WASTE LICENCE
Revision History	A			Rev Origin	

Name of Client

greenstar

Name of Job

KNOCKHARLEY RESIDUAL LANDFILL SITE

Title of Drawing

SITE SERVICES PLAN
SHOWING 250m BOUNDARY OFFSET

Scales Used	This Drawing was printed to
1:10560	A3

Dwg. No.	Rev.
CE07-172-02-FIG-WLA05	A

O:\ACAD\2007\CE07\172-02\CE07172202_FIGWLA05

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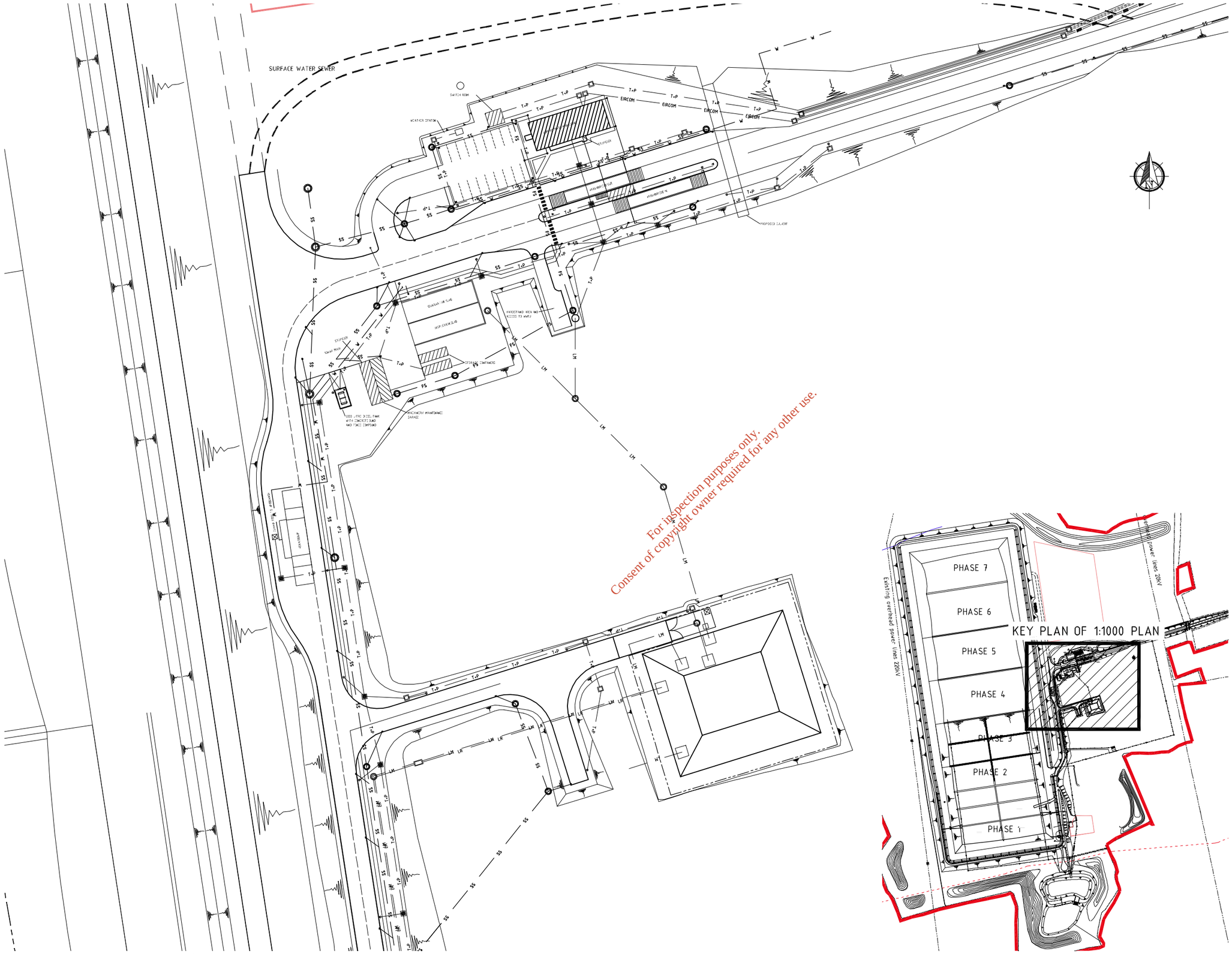
ORIGINAL DRAWING SIZE A1 - (841 x 594)

NATURAL SCALE



Legend

- CABLE DUCT
- LEACHATE MAIN
- WATER MAIN
- FOUL WATER SEWER
- SURFACE WATER SEWER
- EIRCOM — EIRCOM DUCT

SITE PLAN
Scale 1:1000

Scale 1:1000

Rev.	Drawn	Chkd	Appd	Date	Description
A	JC	SMcA	DOS	22.12.08	ISSUE FOR REVISION OF WASTE LICENCE
Revision History				Rev Origin	

Name of Client: greenstar

Name of Job: KNOCKHARLEY RESIDUAL LANDFILL SITE

Title of Drawing: SITE SERVICES PLAN ADMINISTRATION AREA

Scales Used: 1:1000

This Drawing was printed to A3

Dwg. No.: CE07-172-02-FIG-WLA06

Rev.: A

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W: www.fehilytimoney.ie, E: info@ftco.ie

ORIGINAL DRAWING SIZE A1 - (841 x 594)

NATURAL SCALE

ATTACHMENT B.3

Planning Authority

ATTACHMENT B.3 PLANNING AUTHORITY

Planning Permission

Details of the planning permissions that pertain to the site are presented in Table B.3.1 below. The most recent planning permission granted for the site was for a gas utilisation plant. The most recent parent planning permission (NA60336) is attached overleaf.

Table B.3.1 Landfill Planning Permissions

Reg.Ref.No:	Nature of Proposed Development	Nature of Final Decision of Application; Grant or Refusal by Planning Authority/An Bord Pleanála
01/5006 ABP PL 17.125891	to develop & operate an engineered landfill (area 25 ha, height 15m) to accept 180,000 tonnes/annum of non-hazardous waste and all ancillary works.	Meath County Council decision to grant permission. Permission Granted.
FS4155 (July 2004)	administrative building, offices, changing facilities, public area, toilets & canteen	Meath County Council decision to grant permission.
FS4294 (December 2004)	maintenance and repair building	Meath County Council decision to grant permission.
FS4295 (December 2004)	weighbridge building, office, storeroom & toilet	Meath County Council decision to grant permission.
NA50453 (December 2005) ABP PL.17.217669	change of use of maintenance building to offices and to omit condition no. 2(a) of 01/5006 which limits the waste to be accepted for disposal.	Meath County Council split decision to grant permission for change of use to offices and to refuse permission to omit condition no. 2(a). First Party Appeal withdrawn
NA60336 (August 2006) ABP PL 17.220331	(1) extension c. 2 ha to landfill footprint (c. 23 ha) to create an overall landfill footprint of 25 ha (height 15 m) and all ancillary works. (2) to increase the waste intake volume to 200,000 tonnes per annum (tpa) until the 2,800,000 tonnes potential capacity of the landfill facility is complete; and (3) to remove the regional restriction on the origin of the waste accepted at the facility by modifying Condition No. 2(a) of Permission Reg. Ref. No. 01/5006 so the facility can accept waste from adjoining waste regions.	Meath County Council decision to grant permission for (1) extension and to (3) remove the regional restriction. Meath County Council decision to refuse permission for (2) increase the waste intake volume to 200,000 tpa. Permission granted (1) extension to landfill footprint and (3) removal of

		the regional restriction. Permission granted to accept up to 132,000 tpa until the end of 2010, reducing to 88ktpa thereafter.
NA70015 (February 2007)	a landfill gas utilisation plant on a 0.3 hectare site located in the townland of Knockharley at the Knockharley Residual Waste Landfill.	Meath County Council decision to grant permission.

An Bord Pleanála

PLANNING AND DEVELOPMENT ACTS 2000 TO 2006

Meath County

Planning Register Reference Number: NA/60336

An Bord Pleanála Reference Number: PL 17.220331

APPEAL by Greenstar Holdings Limited care of Kiaran O'Malley and Company Limited of Saint Heliers, Saint Heliers Copse, Stillorgan Park, Blackrock, County Dublin against the decision made on the 2nd day of October, 2006 by Meath County Council in relation to an application by the said Greenstar Holdings Limited for permission for (1) extension measuring circa two hectares (height 15 metres) to existing permitted landfill footprint (circa 23 hectares, height 15 metres) to create an overall landfill footprint (circa 25 hectares, height 15 metres) and all ancillary works. The proposed extension comprises 3.4 hectares of earthworks to construct two hectares of EU compliant lined landfill, (2) increase in waste intake volume to 200,000 tonnes per annum (tpa) until the 2,800,000 tonnes potential capacity of the landfill is complete, and (3) removal of the regional restriction on the origin of the waste accepted at the facility by modifying condition number 2(a) of planning register reference number 01/5006 so the facility can accept waste from adjoining waste regions. Site access will continue at the existing permitted access at the N2 National Primary Route and the proposed development will utilise the existing permitted infrastructure and facilities all on a site at Knockharley, Flemingstown and Tuiterath, County Meath in accordance with the plans and particulars lodged with the said Council (which decision was to grant subject to a condition permission for the said removal of the regional restriction on the origin of the waste accepted at the facility by modifying condition number 2(a) of planning register reference number 01/5006 so the facility can accept waste from adjoining waste regions and to refuse permission for the said extension measuring circa two hectares (height 15 metres) to existing permitted landfill footprint (circa 23 hectares, height 15 metres) to create an overall landfill footprint (circa 25 hectares, height 15 metres) and all ancillary works and increase in waste intake volume to 200,000 tonnes per annum (tpa) until the 2,800,000 tonnes potential capacity of the landfill is complete):

DECISION

(1) **GRANT permission for the said extension to the existing landfill footprint in accordance with the said plans and particulars based on the reasons and considerations marked (1) under and subject to the conditions marked (1) set out below.**

(2) **GRANT permission for the said removal of the regional restriction on the origin of the waste accepted at the facility in accordance with the said plans and particulars based on the reasons and considerations marked (2) under and subject to the condition marked (2) set out below.**

(3) **GRANT permission, notwithstanding the decision set out at (4) below, for the continuation of the approved level of the annual intake volume of 132,000 tonnes until the end of 2010, based on the reasons and considerations marked (3) under and subject to the condition marked (3) set out below.**

(4) **REFUSE permission for the said increase in the waste intake volume to 200,000 tonnes per annum, based on the reasons and considerations marked (4) under.**

REASONS AND CONSIDERATIONS (1)

Having regard to the planning history of the site and the designation of the existing landfill as the long term residual landfill for the North East Region, it is considered that the proposed footprint extension would not be incompatible with its 'residual role' or inconsistent with the core objectives of the Waste Management Plan for the North East Region 2005-2010. It is therefore considered that, subject to compliance with the conditions set out below, the proposed development would be in accordance with the proper planning and sustainable development of the area.

CONDITIONS (1)

1. The proposed development shall be carried out in accordance with the conditions attached to the permission granted under appeal reference number PL 17.125891 on the 26th day of August, 2002, except as amended to conform with the provisions indicated in the plans lodged in connection with this application, with the following conditions and with the other elements of this Order.

   Reason: To ensure consistency with the development as previously permitted.

2. The developer shall facilitate the planning authority in the archaeological appraisal of the site and in preserving and recording or otherwise protecting archaeological materials or features, which may exist within the site. In this regard the developer shall:-

(a) notify the planning authority in writing at least four weeks prior to the commencement of any subsurface works (including hydrological and geotechnical investigations) relating to the proposed development, and

(b) employ a suitably-qualified archaeologist prior to the commencement of development. The archaeologist shall assess the site and monitor all site development works.

The assessment shall address the following issues:-

(i) the nature and location of any archaeological material on the site, and

(ii) the impact of the proposed development on such archaeological material.

Prior to the commencement of development, a report containing the results of the assessment shall be submitted to the planning authority. Arising from this assessment, the developer shall agree with the planning authority details regarding any future archaeological requirements (including, if necessary, archaeological excavation) prior to commencement of construction works.

In default of agreement on any of these requirements, the matter shall be referred to An Bord Pleanala for determination.

Reason: In order to conserve the archaeological potential of the site and to secure the preservation of any remains which may exist within the site

3. The developer shall pay to the planning authority a financial contribution in respect of public infrastructure and facilities benefiting development in the area of the planning authority that is provided or intended to be provided by or on behalf of the authority in accordance with the terms of the Development Contribution Scheme made under section 48 of the Planning and Development Act 2000. The contribution shall be paid prior to the commencement of development or in such phased payments as the planning authority may facilitate and shall be subject to any applicable indexation provisions of the Scheme at the time of payment. Details of the application of the terms of the Scheme shall be agreed between the planning authority and the developer or, in default of such agreement, the matter shall be referred to the Board to determine the proper application of the terms of the Scheme.

Reason: It is a requirement of the Planning and Development Act 2000 that a condition requiring a contribution in accordance with the Development Contribution Scheme made under section 48 of the Act be applied to the permission.

REASONS AND CONSIDERATIONS (2)

Having regard to:-

(a) the national waste management policy framework and strategy as set out in the Government policy statement "Waste Management - Taking Stock and Moving Forward," published by the Department of the Environment, Heritage and Local Government in April 2004,

(b) the Policy Directions issued pursuant to section 60 of the Waste Management Act, 1996 (as amended), and

(c) the Waste Management Plan for the North East Region 2005-2010 which facilitates the inter-regional movement of waste,

it is considered that the regional restriction on the source of waste accepted at the facility imposed by condition number 2(a) of the permission granted by An Bord Pleanála under appeal reference number Pl 17.125891 should be removed and that waste accepted at the facility be subject to the condition set out below.

CONDITION (2)

The waste to be accepted for disposal at this facility shall primarily be waste arising in the North–East Region as defined by the Counties of Meath, Louth, Cavan and Monaghan and shall otherwise be in accordance with the proximity principle.

Each consignment of waste arriving for disposal at the facility shall be accompanied by a certificate which shall identify the weight of each consignment, the name and address of the waste collection contractor disposing of the waste and the composition and nature of the waste for disposal. The developer shall submit to the planning authority on a monthly basis records of all waste delivered to the site on a daily, weekly and monthly basis.

Reason: To ensure compliance with national and regional waste management policy.

REASONS AND CONSIDERATIONS (3)

Having regard to the short term waste management capacity needs of the North-East Region and the Greater Dublin Area, it is considered that, subject to compliance with the condition set out below, a continuation for a temporary period of the approved level of the annual intake volume of waste to be accepted (132,000 tonnes) would not conflict with the policies of the Waste Management Plan for the North-East Region or be otherwise contrary to the proper planning and sustainable development of the area.

CONDITION (3)

Waste to be accepted at the facility shall be restricted to 132,000 tonnes per annum until December, 2010, thereafter tonnage for disposal at the facility shall be restricted to a maximum of 88,000 tonnes per annum.

Reason: To meet short-term waste management capacity needs and to ensure compliance with the principles of waste management as set out in the North-East Region Waste Management Plan.

REASONS AND CONSIDERATIONS (4)

Having regard to the current available annual landfill and overall landfill capacity in the North-East Region and to the requirement of the current Waste Management Plan for the North-East Region to reduce the volumes of waste diverted to landfill, it is considered that the proposal to increase the tonnage per annum intake at the facility would compromise the viability of more sustainable waste infrastructure and would compromise the long-term waste infrastructure requirements of the region and the designation of Knockharley as the long-term residual landfill for the region. The proposed development would, therefore, conflict with the policies of the Waste Management Plan for the North-East Region and would be contrary to the proper planning and sustainable development of the area.

Member of An Bord Pleanála
duly authorised to authenticate
the seal of the Board.

Dated this day of 2007.

Environmental Impact Statement

As per 'Waste Licensing Application Guidance Notes', three copies of the EIS (one signed original and two copies) and two copies in electronic searchable PDF format on CD-ROM are enclosed with this waste licence review application.

Waste Licence

Waste licence reference W0146-01 is the current waste licence in force at the site. This is appended overleaf together with a technical amendment issued on the 11 October 2005.

Headquarters,
P.O. Box 3000,
Johnstown Castle Estate
County Wexford, Ireland

WASTE LICENCE
LANDFILL FOR NON-HAZARDOUS WASTE

Waste Licence Register Number:	146-1
Licensee:	Celtic Waste Limited
Location of Facility:	Knockharley Landfill, Knockharley, Navan, County Meath (includes townlands of Tuiterath and Flemingstown).

INTRODUCTION

This introduction is not part of the licence and does not purport to be a legal interpretation of the licence.

This licence is for the operation and development of a landfill at a greenfield site at Knockharley, Navan, County Meath (includes townlands of Tuiterath and Flemingstown). The waste for disposal consists of residual, non-hazardous household, commercial and industrial waste arising in the north-east.

The waste intake is limited to 175,000 tonnes of waste per annum and the facility has an operating life of approximately 14 years. The proposed facility covers an area of 135 hectares. The landfill, which will be positioned in the centre of the site, will cover approximately 25 hectares of this area. The licence requires a buffer zone i.e. an area where no waste will be deposited between the landfill and the nearest residences. A 50m band of this area, inside the facility boundary, will be planted with woodland.

The facility consists of the landfill, an administration building, leachate lagoon, surface water pond, weighbridges, wheelwash and a landfill gas collection and flaring system. These associated infrastructure are necessary so as to control the emissions from the facility. Infrastructure to control emissions to the environment must meet BAT standards. There are no direct discharges of effluent to surface water or groundwater. Leachate will be tankered off-site to a Sanitary Authority waste water treatment plant.

The licensee must manage and operate the facility to ensure that the activities do not cause environmental pollution. The licensee has to carry out regular environmental monitoring and submit all monitoring results, and a wide range of reports on the operation and management of the facility, to the Agency.

The conditions of this licence set out in detail the legal constraints under which Celtic Waste Limited is allowed to operate and manage the Knockharley Facility.

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DECISION & REASONS FOR THE DECISION

Reasons for the Decision

The Environmental Protection Agency (the Agency) is satisfied, on the basis of the information available, that the requirements of Section 40(4) of the Waste Management Act, 1996 have been complied with in respect of the application for a waste licence for the activities listed hereunder in Part I.

In reaching this decision the Agency has considered the application and supporting documentation received from the applicant, all submissions and objections received from other parties, the report of its inspector and the Chairperson of the Oral Hearing Report.

Part I Activities Licensed

In pursuance of the powers conferred on it by the Waste Management Act, 1996, the Agency, under Section 40(1) of the said Act hereby grants this Waste Licence to Celtic Waste Limited, Burton Court, Burton Hall Road, Sandyford, Dublin 18 to carry on the waste activities listed below at the proposed Knockharley Landfill, Knockharley, Navan, Co. Meath (Includes Townlands of Tuiterath and Flemingstown) subject to twelve conditions, with the reasons therefor and the associated schedules attached thereto set out in the licence.

Licensed Waste Disposal Activities, in accordance with the Third Schedule of the Waste Management Act 1996

Class 1.	**Deposit on, in or under land (including landfill):**
	This activity is limited to the deposit of non-hazardous wastes specified in Condition 1.4 in lined cells that are on, in and under land.
Class 4.	**Surface impoundment, including placement of liquid or sludge discards into pits, ponds or lagoons:**
	This activity is limited to the storage of leachate in a lagoon prior to disposal off-site at a suitable waste water treatment plant and the use of a surface water pond to control the quality and quantity of the surface water run-off from the site.
Class 5.	**Specially engineered landfill, including placement into lined discrete cells which are capped and isolated from one another and the environment.**
	This activity is limited to the deposition of non-hazardous waste into lined cell(s).
Class 6.	**Biological treatment not referred to elsewhere in this Schedule which results in final compounds or mixtures which are disposed of by means of any activity referred to in paragraphs 1. to 10. of this Schedule:**
	This activity is limited to possible future biological pre-treatment of leachate subject to the agreement of the Agency.
Class 13.	**Storage prior to submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where the waste concerned is produced.**
	This activity is limited to the temporary storage on-site of unacceptable waste in the waste quarantine area prior to transport to another site.

Licensed Waste Recovery Activities, in accordance with the Fourth Schedule of the Waste Management Act 1996

Class 4.	**Recycling or reclamation of other inorganic materials:**
	This activity is limited to the use of recycled construction and demolition waste as cover and/or construction material at the site.
Class 9.	**Use of any waste principally as a fuel or other means to generate energy:**
	This activity is limited to the utilisation of landfill gas.
Class 11.	**Use of waste obtained from any activity referred to in a preceding paragraph of this Schedule:**
	This activity is limited to the use of construction and demolition waste on-site.
Class 13.	**Storage of waste intended for submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where such waste is produced:**
	This activity is limited to the storage of construction and demolition waste on site prior to reuse.

INTERPRETATION

All terms in this licence should be interpreted in accordance with the definitions in the Waste Management Act, (the Act), unless otherwise defined in this section.

Adequate lighting	20 lux measured at ground level.
Agreement	Agreement in writing.
Annually	At approximately twelve monthly intervals.
Attachment	Any reference to Attachments in this licence refers to attachments submitted as part of the waste licence application.
Application	The application by the licensee for this waste licence.
Appropriate facility	A waste management facility, duly authorised under relevant law and technically suitable.
Biodegradable waste	Any waste that is capable of undergoing anaerobic or aerobic decomposition, such as food, garden waste, sewage sludge, paper and paperboard.
Buffer Zone	The zone between the area within which no waste shall be deposited and the boundary of the facility.
Condition	A condition of this licence.
Construction and Demolition Waste	All wastes which arise from construction, renovation and demolition activities.
Containment boom	A boom which can contain spillages and prevent them from entering drains or watercourses.
Cover material	Bricks, crushed concrete, tarmac, earth, soil, sub-soil, stone, rock or other similar natural materials or other cover material the use of which has been agreed with the Agency.
Daily Cover	Is the term used to describe material spread (about 150mm if soil cover is used) over deposited waste at the end of each day. Synthetic materials may also be used. Its objective is to minimise odour, the amount of litter generated and to control flies and access to the waste by birds and vermin. Where soils are used for daily cover, it is recommended that they be removed at the start of the day and subsequently reused as much as possible
Daytime	8.00 a.m. to 10.00 p.m.
Documentation	Any report, record, result, data, drawing, proposal, interpretation or other document in written or electronic form which is required by this licence.
Drawing	Any reference to a drawing or drawing number means a drawing or drawing number contained in the application, unless otherwise specified in this licence.
Emergency	Those occurrences defined in Condition 9.4
Emission Limits	Those limits, including concentration limits and deposition levels established in *Schedule C: Emission Limits*, of this licence

European Waste Catalogue (EWC)	A harmonised, non-exhaustive list of wastes drawn up by the European Commission and published as Commission Decision 94/3/EC and any subsequent amendment published in the Official Journal of the European Community.
Footprint	Area where waste is deposited of in lined cells
Green waste	Waste wood (excluding timber), plant matter such as grass cuttings, and other vegetation.
Hours of Operation	7.30 to 18.30 Monday to Saturday.
Hours of Waste Acceptance	8.00 to 18.00 Monday to Saturday.
Inert waste	Waste that does not undergo any significant physical, chemical or biological transformations. Inert waste will not dissolve, burn or otherwise physically or chemically react, biodegrade or adversely affect other matter with which it comes into contact in a way likely to give rise to environmental pollution or harm human health. The total leachability and pollutant content of the waste and the ecotoxicity of the leachate must be insignificant, and in particular not endanger the quality of surface water and/or groundwater.
Intermediate Cover	Refers to placement of material (minimum 300mm if soil is used) for a period of time prior to restoration or prior to further disposal of waste.
Landfill	Refers to the area of the facility where the waste is disposed of by placement on the ground or on other waste.
Landfill Gas	Gases generated from the landfilled waste.
LEL (Lower Explosive Limit)	The lowest percentage concentration by volume of a mixture of flammable gas with air which will propagate a flame at 25^{o}C and atmospheric pressure.
Licence	A Waste Licence issued in accordance with the Act.
Licensee	Celtic Waste Limited.
List I/II Organics	Substances classified pursuant to EC Directives 76/464/EEC and 80/68/EEC.
Liquid Waste	Any waste in liquid form and containing less than 2% dry matter. Any waste tankered to the facility.
Maintain	Keep in a fit state, including such regular inspection, servicing and repair as may be necessary to adequately perform its function.
Mobile Plant	Self-propelled machinery used for the emplacement of wastes or for the construction of specified engineering works.
Monthly	A minimum of 12 times per year, at approximately monthly intervals.
Night-time	10.00 p.m. to 8.00 a.m.
Recyclable Materials	Those waste types, such as cardboard, batteries, gas cylinders, etc, which may be recycled.
Residual Waste	Residual waste means the fraction of waste remaining after the treatment of waste.

Quarterly	At approximately three monthly intervals.
Sample(s)	Unless the context of this licence indicates to the contrary, samples shall include measurements by electronic instruments.
SCADA system	Supervisory Control and Data Acquisition system.
Sludge	The accumulation of solids resulting from chemical coagulation, flocculation and/or sedimentation after water or wastewater treatment with between 2% and 14% dry matter.
Specified Emissions	Those emissions listed in *Schedule C: Emission Limits* of this licence.
Specified Engineering Works	Those engineering works listed in *Schedule B: Specified Engineering Works* of this licence.
Treated Sludge	Sludge which has undergone biological, chemical or heat treatment, long-term storage or any other appropriate process so as significantly to reduce its fermentability and the health hazards resulting from its use.
Treatment	Treatment means the physical, thermal, chemical or biological processes, including sorting, that change the characteristics of the waste in order to reduce its volume or hazardous nature, facilitate its handling or enhance recovery.
Trigger Level	A parameter value specified in the licence, the achievement or exceedance of which requires certain actions to be taken by the licensee.
White Goods	Refrigerators, cookers, ovens and other similar appliances.
EPA Working Day	Refers to the following hours; 9.00 a.m. to 5.30 p.m. Monday to Friday inclusive.
Working Face	The area of the site in which waste other than cover material or material for the purposes of the construction of specified engineering works is being deposited.

PART II CONDITIONS

CONDITION 1 SCOPE OF THE LICENCE

1.1. Waste activities at the facility shall be restricted to those listed and described in Part I: Activities Licensed and authorised by this licence.

1.2. For the purposes of this licence, the facility is the area of land outlined in bold red on Drawing No. 2000-144-01-01 entitled Landfill Layout and Figure B2.2 Location Map of the application. Any reference in this licence to "facility" shall mean the area thus outlined in red.

1.3. This licence is for the purposes of waste licensing under the Waste Management Act 1996 only and nothing in this licence shall be construed as negating the licensee's statutory obligations or requirements under any other enactments or regulations.

1.4. Municipal Waste, Commercial Waste and Industrial Waste may be disposed of at the facility subject to the maximum quantities and other constraints listed in *Schedule A: Waste Acceptance*, of this licence.

1.5. No hazardous wastes or liquid wastes shall be disposed of at the facility.

1.6. The licensee shall ensure that all waste accepted at the facility is subject to treatment. This provision may not apply to inert wastes for which treatment is not technically feasible nor to any other waste for which such treatment does not contribute to the objectives of the Landfill Directive as set out in Article 1 of the Directive by reducing the quantity of the waste or the hazards to human health or the environment.

1.7. Whole used tyres (other than bicycle tyres and tyres with an outside diameter greater than 1400mm) shall not be disposed of at the facility from 16 July 2003. Shredded tyres shall not be disposed of at the facility from 16 July 2006.

1.8. Waste Acceptance Hours and Hours of Operation

1.8.1. Landfill

1.8.1.1 Waste shall only be accepted at the facility for disposal at the landfill between the hours of 8.00 to 18.00 Monday to Saturday inclusive.

1.8.1.2 The facility shall only be operated during the hours of 7.30 to 18.30 Monday to Saturday inclusive.

1.8.1.3 Waste shall not be accepted at the landfill on Bank Holidays.

1.9 The following shall constitute an incident for the purposes of this licence:

a) an emergency;

b) any emission which does not comply with the requirements of this licence;

c) any trigger level specified in this licence which is attained or exceeded;

d) any indication that environmental pollution has, or may have, taken place and

e) any rejected load of waste.

1.10 Where the Agency considers that a non-compliance with any condition of this licence has occurred, it may serve a notice on the licensee specifying:

1.10.1 That only those wastes as specified, if any, in the notice are to be accepted at the facility after the date set down in the notice;

1.10.2 That the licensee shall undertake the works stipulated in the notice, and/or otherwise comply with the requirements of the notice as set down therein, within the time-scale contained in the notice; and

1.10.3 That the licensee shall carry out any other requirement specified in the notice.

When the notice has been complied with, the licensee shall provide written confirmation that the requirements of the notice have been carried out. No waste, other than that which is stipulated in the notice, shall be accepted at the facility until written permission is received from the Agency.

1.11 Every plan, programme or proposal submitted to the Agency for its agreement pursuant to any Condition of this licence shall include a proposed timescale for its implementation. The Agency may modify or alter any such plan, programme or proposal in so far as it considers such modification or alteration to be necessary and shall notify the licensee in writing of any such modification or alteration. Every such plan, programme or proposal shall be carried out within the timescale fixed by the Agency but shall not be undertaken without the agreement of the Agency. Every such plan, programme or proposal agreed by the Agency shall be covered by the conditions of this licence.

REASON: To clarify the scope of this licence.

CONDITION 2 MANAGEMENT OF THE FACILITY

2.1 Facility Management

2.1.1 The licensee shall employ a suitably qualified and experienced facility manager who shall be designated as the person in charge. The facility manager or a nominated, suitably qualified and experienced, deputy shall be present on the facility at all times during its operation.

2.1.2 Both the facility manager and deputy, and any replacement manager or deputy, shall successfully complete both the FAS waste management training programme (or equivalent agreed with the Agency) and associated on site assessment appraisal within twelve months of appointment.

2.1.3 The licensee shall ensure that personnel performing specifically assigned tasks shall be qualified on the basis of appropriate education, training and experience, as required and shall be aware of the requirements of this licence.

2.2 Management Structure

2.2.1 Prior to the commencement of waste activities the licensee shall submit written details of the management structure of the facility to the Agency. Any proposed replacement in the management structure shall be notified in advance in writing to the Agency. Written details of the management structure shall include the following information

a) the names of all persons who are to provide the management and supervision of the waste activities authorised by the licence, in particular the name of the facility manager and any nominated deputies;

b) details of the responsibilities for each individual named under a) above; and

c) details of the relevant education, training and experience held by each of the persons nominated under a) above.

2.3 Environmental Management System (EMS)

2.3.1 The licensee shall establish and maintain an EMS. The licensee shall three months prior to the commencement of waste activities at the facility submit to the Agency for its agreement a proposal for a documented Environmental Management System (EMS) for the facility. Following the agreement of the Agency, the licensee shall establish and maintain such a system. The EMS shall be updated on an annual basis with amendments being submitted to the Agency for its agreement.

2.3.2 The EMS shall include as a minimum the following elements:

2.3.2.1 Schedule of Environmental Objectives and Targets

The objectives should be specific and the targets measurable. The Schedule shall address a five-year period as a minimum. The Schedule shall include a time-scale for achieving the objectives and targets and shall comply with any other written guidance issued by the Agency.

2.3.2.2 Environmental Management Plan (EMP)

The EMP shall include, as a minimum, the following:

(i) the items specified to be contained in an Environmental Management Plan in the Landfill Operational Practices Manual published by the Agency;

(ii) methods by which the objectives and targets will be achieved and the identification of those responsible for achieving those objectives and targets;

(iii) any other items required by written guidance issued by the Agency.

2.3.2.3 Corrective Action Procedures

The Corrective Action Procedures shall detail the corrective actions to be taken should any of the procedures detailed in the EMS not be followed.

2.3.2.4 Awareness and Training Programme

The Awareness and Training Programme shall identify training needs, for personnel who work in or have responsibility for the licensed facility.

2.4 Communications Programme

2.4.1 The licensee shall establish and maintain a Communications Programme to inform and involve the local community and to ensure that members of the public can obtain information at the facility, at all reasonable times, concerning the environmental performance of the facility. This shall be established three months prior to the commencement of waste activities at the facility.

REASON: To make provision for the proper management of the activity on a planned basis having regard to the desirability of ongoing assessment, recording and reporting of matters affecting the environment.

CONDITION 3 FACILITY INFRASTRUCTURE

3.1 The licensee shall establish all infrastructure referred to in this licence prior to the commencement of the licensed activities or as required by the conditions of this licence.

3.2 Specified Engineering Works

3.2.1 The licensee shall submit proposals for all Specified Engineering Works, as defined in *Schedule B: Specified Engineering Works*, of this licence to the Agency for its agreement at least two months prior to the intended date of commencement of any such works. No such works shall be carried out without the prior agreement of the Agency.

3.2.2 All specified engineering works shall be supervised by a competent person(s) and that person, or persons, shall be present at all times during which relevant works are being undertaken.

3.2.3 Following the completion of all specified engineering works, the licensee shall complete a construction quality assurance validation. The validation report shall be made available to the Agency on request. The report shall include the following information:

a) a description of the works;

b) as-built drawings of the works;

c) records and results of all tests carried out (including failures);

d) drawings and sections showing the location of all samples and tests carried out;

e) daily record sheets/diary;

f) name(s) of contractor(s)/individual(s) responsible for undertaking the specified engineering works;

g) name(s) of individual(s) responsible for supervision of works and for quality assurance validation of works;

h) records of any problems and the remedial works carried out to resolve those problems; and

i) any other information requested in writing by the Agency.

3.3 Facility Notice Board

3.3.1 The licensee shall provide and maintain a Facility Notice Board on the facility so that it is legible to persons outside the main entrance to the facility. The minimum dimensions of the board shall be 1200 mm by 750 mm.

3.3.2 The board shall clearly show:

a) the name and telephone number of the facility;

b) the normal hours of opening;

c) the name of the licence holder;

d) an emergency out of hours contact telephone number;

e) the licence reference number; and

f) where environmental information relating to the facility can be obtained.

3.4 Facility Security

3.4.1 Security and stockproof fencing, gates and infrastructure shall be installed and maintained as described in Section 3.1.6 ‘Site Security’ of the EIS. The locations shall be as shown on Drawing No’s. 2000-144-01-11 ‘Fencing Details’ and 2000-144-01-12

'Security & Fencing Layout' unless otherwise agreed with the agency. The base of the fencing shall be set in the ground.

3.4.2 The licensee shall remedy any defect in the gates and/or fencing as follows:

a) a temporary repair shall be made by the end of the working day; and,

b) a repair to the standard of the original gates and/or fencing shall be undertaken within three working days.

3.4.3 Prior to the acceptance of waste at the facility Closed Circuit Television (CCTV) shall be installed as described in Section 3.1.6 'Site Security' of the EIS.

3.5 Facility Roads, Access Roads and Hardstanding

3.5.1 Effective site roads shall be provided and maintained to ensure the safe movement of vehicles within the facility. The proposed internal road network system and hardstanding areas shall be provided and maintained.

3.5.2 The proposed access road from the N2 shall be constructed prior to the commencement of construction of the remainder of the facility.

3.5.3 Access to and from the facility shall only be from the N2.

3.5.4 The licensee shall consult with the roads authority on the prohibition of construction, waste disposal or leachate vehicles using the R150 road or the county road CR384 north and east of the facility en route to or from the facility.

3.6 Facility Office

3.6.1 Prior to the commencement of waste activities at the facility the licensee shall provide and maintain an office at the facility. The office shall be constructed and maintained in a manner suitable for the processing and storing of documentation.

3.6.2 The licensee shall provide and maintain a working telephone and a method for electronic transfer of information at the facility.

3.7 Waste Inspection and Quarantine Areas

3.7.1 A Waste Inspection Area and a Waste Quarantine Area shall be provided and maintained at the facility.

3.7.2 These areas shall be constructed and maintained in a manner suitable, and be of a size appropriate, for the inspection of waste and subsequent quarantine if required. The waste inspection area and the waste quarantine area shall be clearly identified and segregated from each other.

3.7.3 Drainage from these areas shall be directed to the leachate lagoon.

3.8 Weighbridge

3.8.1 Prior to the commencement of waste activities at the facility the licensee shall provide and maintain two weighbridges at the facility.

3.9 Wheel Cleaning

3.9.1 Prior to the commencement of construction of the facility the licensee shall establish and maintain a dry wheel shake and wheelwash at the facility.

3.9.2 The wheel cleaner units shall be inspected on a daily basis and drained as required. Silt, stones and other accumulated material shall be removed as required from the wheel cleaner units. Prior to the construction of the leachate lagoon accumulated liquid in the wheel cleaner units shall be tankered off-site to an appropriate facility. Following construction of the leachate lagoon dirty water from the wheel cleaner shall be pumped to the lagoon.

3.10 Waste Water Treatment Plant

3.10.1 The licensee shall provide and maintain a Wastewater Treatment plant at the facility for the treatment of domestic wastewater arising on-site.

3.10.2 The outlet from the treatment plant shall discharge to the leachate lagoon.

3.10.3 During construction all wastewater arising on site shall be collected and disposed of off-site at a suitable Waste Water Treatment Plant unless otherwise agreed with the Agency.

3.11 Tank and Drum Storage Areas

3.11.1 The licensee shall provide and maintain a bunded fuel storage area at the facility.

3.11.2 All tank and drum storage areas shall be rendered impervious to the materials stored therein.

3.11.3 All tank and drum storage areas shall, as a minimum, be bunded, either locally or remotely, to a volume not less than the greater of the following:

(a) 110% of the capacity of the largest tank or drum within the bunded area; or

(b) 25% of the total volume of substance which could be stored within the bunded area.

3.11.4 All drainage from bunded areas shall be diverted for collection and safe disposal.

3.11.5 All inlets, outlets, vent pipes, valves and gauges must be within the bunded area.

3.11.6 The integrity and water tightness of all the bunds, tanks and containers and their resistance to penetration by water or other materials stored therein shall be tested and demonstrated by the licensee and shall be reported to the Agency following their installation and prior to their use as a fuel storage area. This testing shall be carried out by the licensee at least once every three years thereafter and reported to the Agency on each occasion. The licensee shall also maintain a record on the storage of fuels at the facility. A written record of all integrity tests and any maintenance or remedial work arising from them shall be maintained by the licensee.

3.11.7 All tanks and containers, including tankers used to transport leachate from the facility, shall be labelled to clearly indicate their contents.

3.12 Landfill Lining:

3.12.1 The landfill liner shall comprise:

(i) a composite liner consisting of a 1m layer of compacted soil with a hydraulic conductivity of less than or equal to $1x10^{-9}$m/s, (or equivalent to be agreed with the Agency) overlain by a 2mm thick high density polyethylene (HDPE) layer;

(ii) a geotextile protection layer placed over the HDPE layer;

(iii) a 500mm thick drainage layer placed over the geotextile layer with a minimum hydraulic conductivity of 1 x 10^{-3} m/s, of pre-washed, uncrushed, granular, rounded stone (16 - 32mm grain size) incorporating leachate collection drains;

(iv) the side walls shall be designed and constructed to achieve an equivalent protection.

3.12.2 The liner system for the two leachate storage lagoons and the surface water pond shall comprise the following: a composite liner consisting of at minimum a basal soil/clay layer of at least 1m in thickness with a permeability of less than $1x10^{-9}$m/s overlain by a 2mm thick high density polyethylene (HDPE) layer unless otherwise agreed in advance with the Agency.

3.12.3 The liner detailed design and its construction shall be in accordance with the guidelines provided in the Agency's Landfill Manual, Landfill Site Design.

3.12.4 Formation levels of the cells shall be as shown on Drawing No. 2000 –144-01-06 'Landfill Section' of the EIS.

3.13 Buffer Zone

3.13.1 A Buffer Zone, in which no waste shall be landfilled, shall be provided and maintained within the facility.

The Buffer Zone shall be a minimum of 100m between the landfill footprint (area being filled with waste) and the facility boundary.

3.14 Leachate Management Infrastructure

3.14.1 Effective leachate management infrastructure shall be provided and maintained at the facility as described in Section 3.1.3.9 'Leachate Collection System and Management Plan' of the EIS.

3.14.2 The licensee shall provide and maintain leachate storage lagoons at the facility to facilitate the storage of leachate abstracted/collected from the waste

3.14.3 The location of the leachate storage lagoons shall be as detailed on Drawing No. 2000-144-01-01 'Landfill Layout' unless otherwise agreed with the Agency.

3.14.4 All structures for the storage and/or treatment of leachate shall be fully enclosed except for inlet and outlet piping.

3.14.5 All leachate management structures on-site shall be inspected and certified fit for purpose on an annual basis by an independent and appropriately qualified chartered engineer. Any remedial works recommended in this report must be implemented immediately.

3.15 Landfill Gas Management

3.15.1 Landfill gas management at the facility shall be carried out as described in Section 3.1.4 Gas Management of the EIS submitted with the application unless the licence conditions require otherwise.

3.15.2 A Landfill Gas Flare and associated infrastructure shall be installed on the facility within six months of the date on which waste is first disposed of at the facility.

i) The flare shall be of an enclosed type design and shall comply with the emission limits in *Schedule C: Emission Limits*, of this licence.

ii) The relocation of the gas flaring system to the west of the facility shall be investigated prior to the final location being agreed with the Agency. The report of the investigation will accompany the proposal for installation of

landfill gas management infrastructure required under Condition 3.2.1 and shall include the results of modelling carried out on the expected level of emissions.

3.15.3 Flare unit efficiency shall be tested upon installation, upon commencement of landfill gas combustion and once every three years thereafter.

3.15.4 The licensee shall maintain all gas wells, pipework, valves, pumps, flares and other infrastructure that form part of the landfill gas management scheme in a safe and fully operational manner.

3.15.5 Until the operation of the landfill gas flare, passive landfill gas management at the facility shall be carried out. Landfill gas management and infrastructure shall meet the recommendations outlined in the Agency Manuals on 'Landfill Site Design' and "Landfill Operational Practices".

3.15.6 All buildings constructed on the facility shall have regard to the guidance given in the Department of Environment 1994 publication "Protection of New Buildings and Occupants from Landfill Gas" and any subsequent revisions.

3.15.7 The licensee shall submit an assessment, within twelve months of the date of grant of the licence, on whether the utilisation of landfill gas as an energy resource is feasible. If feasible such a system shall be installed within a timeframe agreed with the Agency. This assessment shall include proposals regarding the utilisation of heat energy from this plant at other premises / facilities at and in the vicinity of the facility and the feasibility of using landfill gas as a fuel for on-site vehicles.

3.15.8 The licensee shall install continuous carbon monoxide monitors on the outlets of the gas engine(s).

3.16 Surface Water Management

3.16.1 Effective surface water management infrastructure shall be provided and maintained at the facility during construction, operation, restoration and aftercare of the facility.

3.16.2 Surface water management infrastructure shall be provided and maintained at the facility. As a minimum, the infrastructure shall be capable of the following:

a) the prevention of contaminated water and leachate discharges into surface water drains and courses; and

b) the collection/diversion of run off arising from capped and restored areas, incorporating adequately sized swales.

3.16.3 Following consultation with the Eastern Regional Fisheries Board and within three months of the date of grant of licence the licensee shall submit to the Agency for agreement a proposal for the surface water arrangements on-site. The Proposal shall include drawings for the diversion of the on-site stream around the landfill and the diversion of the stream to the surface water pond as per Condition 9.4.5.

3.16.4 The surface water ponds, surface water management infrastructure and stream diversions shall be constructed and operational prior to the commencement of other construction works.

3.16.5 The surface water from all roads, hardstanding areas and all areas of the facility where surface water has the potential to become contaminated shall be directed to the surface water pond.

3.16.6 The design and capacity of the surface water pond shall ensure that it is capable of fulfilling the requirements of this licence and dealing with all surface water run-off from potentially contaminated areas of the facility. The surface water pond shall be

constructed and maintained at the location as shown in Drawing No. 2000-114-01-05 'Leachate Lagoon and Storm Water Pond Details' unless otherwise agreed with the Agency.

3.16.7 The inlet to the surface water pond shall be fitted with a Class I Full Oil Interceptor.

The discharge from the surface water pond shall be controlled by an actuated penstock that will prevent surface water discharging in the event that monitoring should indicate contamination of the surface water.

3.17 Groundwater Management

3.17.1 Effective groundwater management infrastructure shall be provided and maintained at the facility during construction, operation, restoration and aftercare of the facility. As a minimum, the infrastructure shall be capable of the following:

a) the protection of the groundwater resources from pollution by the waste activities; and

b) the protection of other infrastructure, such as the liner, from any adverse effects caused by the groundwater.

3.18 A perimeter berm shall be constructed at the facility as described in Section 4.10.3 'Mitigation, Construction Aspects' of the EIS.

3.19 Telemetry

3.19.1 Prior to the commencement of waste activities a telemetry system shall be installed and maintained at the facility. This system shall include leachate re-circulation details for agreement with the Agency. All facility operations linked to the telemetry system shall also have a manual control which will be reverted to in the event of break in power supply or during maintenance.

3.20 Monitoring Infrastructure

3.20.1 Landfill Gas

(i) The construction of the monitoring boreholes shall be phased so as to match the phased development of cells. The licensee shall install landfill gas monitoring infrastructure at the following locations.

(a) perimeter monitoring boreholes at 50m intervals around the periphery of the landfill footprint,

(b) site office and all other site buildings; and

(c) a minimum of two monitoring boreholes per hectare within the waste mass.

(ii) Prior to the commencement of waste disposal activities, the licensee shall install a permanent continuous gas monitoring system with an alarm in the site office and in any other enclosed structures at the facility.

3.20.2 Groundwater

(i) Prior to the commencement of waste disposal activities, the licensee shall install the following borehole monitoring points to allow for the sampling and analyses of groundwater:

a) MW1d, MW2d, MW3d, MW5d, MW6d, MW7d and MW16d as detailed in Table J.1 and Figure J.1 'Suggested Monitoring Locations' of the EIS.

3.20.3 Leachate

(i) Prior to the commencement of waste disposal activities, the licensee shall install leachate monitoring points in each active cell and in each leachate storage lagoon to allow for the sampling and analyses of leachate.

3.20.4 Replacement of Infrastructure

(i) Monitoring infrastructure which is damaged or proves to be unsuitable for its purpose shall be replaced within three months of it being damaged or recognised as being unsuitable.

3.21 Meteorological Monitoring

3.21.1 Prior to the commencement of waste activities the licensee shall provide and maintain a meteorological station at the facility capable of monitoring the parameters listed in Schedule D.6: Meteorological Monitoring of this licence.

3.22 The licensee shall consult with Bord Gáis prior to construction or development work within 100m of the gas pipeline.

3.23 Within three months of the date of grant of this licence and prior to commencement of construction works, the licensee shall submit to the Agency for its agreement, a proposal after consulting Dúchas and the Department of Agriculture and Food on the relocation of badgers, newts, frogs, bats and barn owls within the facility. Timetables for removal of trees and preliminary development work shall be in accordance with the requirements of the Wildlife Act 1996.

REASON: To provide appropriate infrastructure for the protection of the environment.

CONDITION 4 RESTORATION AND AFTERCARE

4.1. Within eighteen months of the date of grant of this licence, the licensee shall submit to the Agency for its agreement a detailed Restoration and Aftercare Plan for the facility. The Restoration and Aftercare Plan shall have regard to the guidance published in the Agency's Landfill Manual on "Landfill Restoration and Aftercare". The licensee shall restore the facility on a phased basis. In particular the plan shall include:

a) Potential restoration options;
b) The proposed consultation process in relation to the restoration options for the facility; and
c) Proposals for nature conservation and woodland restoration.

4.2. The final profile/height of the facility shall be a maximum of 74mOD Malin and be domed in shape. The licensee shall submit a map showing the final contour layout within three months of the date of grant of licence.

4.3. Final Capping

4.3.1. The final capping shall consist of the following:

a) top soil (150 -300mm);

b) subsoils, such that total thickness of top soil and subsoils is at least 1m;

c) drainage layer of 0.5m thickness having a minimum hydraulic conductivity of $1x10^{-4}$ m/s or an equivalent geosynthetic layer;

d) compacted mineral layer of a minimum 0.6m thickness with a permeability of less than $1x10^{-9}$ m/s or a geosynthetic material (e.g. GCL) or similar that provides equivalent protection; and

e) gas collection layer of natural material (minimum 0.3m) or a geosynthetic layer.

4.4. The licensee shall maintain a stockpile of capping materials at the facility containing the requisite volume of capping materials for a six-month period. If using geosynthetic material, the licensee shall ensure that adequate secure supplies are available.

4.5. No material or object that is incompatible with the proposed restoration of the facility shall be present within one metre of the final soil surface levels.

4.6. Where tree planting is to be carried out above waste-filled areas, a synthetic barrier shall be used to augment the clay cap in accordance with the EPA Manual on Landfill Restoration And Aftercare.

4.7. Soil Storage

4.7.1. All soils shall be stored to preserve the soil structure for future use.

REASON: To provide for the restoration of the facility.

CONDITION 5 FACILITY OPERATIONS AND WASTE MANAGEMENT

5.1 Wastes shall not be deposited in any cell or part of the landfill without the prior agreement of the Agency.

5.2 Waste shall only be accepted at the facility from holders of waste collection permits under the Waste Management (Collection) Permits Regulations 2000. The licensee must maintain copies of these waste permits on-site.

5.3 Waste Acceptance and Characterisation Procedures

5.3.1 Prior to commencement of waste acceptance at the facility, the licensee shall submit to the Agency for its agreement and approval written procedures for the acceptance and handling of all wastes. These procedures shall detail the treatment of waste required prior to acceptance at the facility and shall also include methods for the characterisation of waste in order to distinguish between inert, non-hazardous and hazardous wastes. The procedures shall take into account the European Council decision of 19 December 2002 establishing the criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 and Annex II of Directive 1999/31/EC on the landfill of waste.

5.4 All wastes shall be checked at the working face. Any wastes not suitable for acceptance shall be removed for recovery or disposal at an appropriate alternative facility. Such waste shall be stored in the Waste Quarantine Area only. No waste shall be stored in the Waste Quarantine Area for more than one month.

5.5 The licensee shall ensure that inert waste accepted at the facility is subject to pre-treatment where technically feasible and appropriate.

5.6 Working Face

5.6.1 Unless the prior agreement of the Agency is given, the following shall apply at the landfill:

a) only one working face shall exist at the landfill at any one time for the deposit of waste other than cover or restoration materials; and

b) the working face of the landfill shall be no more than 2.5 metres in height after compaction, no more than 25 metres wide and have a slope no greater than 1 in 3.

5.6.2 All waste deposited at the working face shall be compacted, using a steel wheeled compactor, and covered as soon as is practicable and at any rate prior to the end of the working day.

5.6.3 The working face, or faces, shall each day at the end of the day, be covered with suitable material.

5.7 Daily and Intermediate Cover

5.7.1 Daily and Intermediate capping material shall be as described in Section 3.1.5.1 'Intermediate Capping' of the EIS. Daily cover should be 150mm in depth while intermediate capping should be 300mm in depth unless otherwise agreed with the Agency.

5.7.2 The working face of the operational cell shall, at the end of each day, be covered with suitable material to minimise any nuisances occurring.

5.7.3 Any cover material at any location within the facility which is eroded, washed off or otherwise removed shall be replaced by the end of the working day.

5.8 Landscaping

5.8.1 Landscaping of the facility as described in Section 4.10 'Landscape and Visual Aspects' and associated figures of the EIS shall commence within the first planting season from the date of grant of this licence.

5.8.2 Apart from the removal of hedgerow to facilitate the facility entrance, the existing hedgerow network which forms the boundary of the facility shall be retained by the licensee as indicated in Section 4.10 'Landscape and Visual Aspects' of the EIS. Prior to the removal of hedgerow at the entrance and following consultation with Dúchas, the licensee shall submit to the Agency for agreement a proposal on the removal of hedgerow at the facility.

5.8.3 The Licensee shall submit a report, as part of the AER, on the implementation of the landscaping programme. In particular the report shall outline progress in meeting objectives outlined in Section 4.10.3 of the EIS, planting, die back rate and enhancement of natural biodiversity.

5.9 Operational Controls

5.9.1 The landfill shall be filled in accordance with the seven phase sequence outlined in Sections 3.1.3 as specified in the EIS.

5.9.2 All large hollow objects and other large articles deposited at the facility shall be crushed, broken up, flattened or otherwise treated.

5.9.3 Wastes once deposited and covered shall not be excavated, disturbed or otherwise picked over with the exception of works associated with the construction and installation of the landfill gas collection system only with the prior agreement from the Agency.

5.9.4 Completed areas of the landfill shall be profiled so that no depressions exist in which water may accumulate.

5.9.5 Filled cells shall be permanently capped within twelve months of the cells having been filled to the required level.

5.9.6 Scavenging shall not be permitted at the facility.

5.9.7 Gates shall be locked shut when the facility is unsupervised.

5.9.8 The licensee shall provide and use adequate lighting during the operation of the facility in hours of darkness.

5.9.9 Fuels shall only be stored at appropriately bunded locations on the facility.

5.9.10 All tanks and drums shall be labelled to clearly indicate their contents.

5.9.11 No smoking shall be allowed on the facility (other than in the administration/office block as shown on Drawing No. 2000-144-01-02 "Site Facilities Services Layout").

5.10 Off-site Disposal and Recovery

5.10.1 Waste sent off-site for recovery or disposal shall only be conveyed by a waste contractor agreed by the Agency.

5.10.2 All waste transferred from the facility shall only be transferred to an appropriate facility agreed by the Agency.

5.10.3 All waste removed off-site for recovery or disposal shall be transported from the facility to the consignee in a manner which will not adversely affect the environment.

5.11 Leachate Management

5.11.1 The licensee shall submit details for agreement with the Agency on any proposals for the pre-treatment of leachate on-site prior to carrying out such an activity. The details shall include information on the proposed leachate treatment system including its operational criteria, the proposed standards for treated leachate and a timescale for the construction and commissioning of the system.

5.11.2 Leachate levels in the waste shall not exceed a level of 1.0m over the top of the liner at the base of the landfill.

5.11.3 The level of leachate in the pump sumps shall be continuously monitored.

5.11.4 Unless otherwise agreed with the Agency leachate stored in the leachate storage lagoon shall be disposed of by tankering off-site in fully enclosed road tankers and discharging to an agreed Sanitary Authority Waste Water Treatment Plant as per Condition 6.7.1. The frequency of leachate removal from the leachate lagoon shall be such that a minimum freeboard of 0.75m shall be maintained in the leachate lagoon at all times.

5.12 Leachate Re-circulation

5.12.1 Re-circulation of leachate or other contaminated water shall not be undertaken without the prior agreement of the Agency and shall only be undertaken within cells which have been lined and capped to the satisfaction of the Agency.

5.13 Noise

5.13.1 In order to mitigate against noise emissions from the facility the licensee shall:

a) Construct an earth berm, three metres in height, around the perimeter of the waste disposal cells;

b) Plant a 50 metre wide band of woodland plantation inside the entire facility boundary where it does not interfere with overhead powerlines;

c) Impose vehicle speed limits on all internal site roads; and

d) Fit all heavy machinery used on-site with acoustic panels in the engine bays and acoustic mufflers (exhaust silencers).

5.14 Maintenance

5.14.1 All treatment/abatement and emission control equipment shall be calibrated and maintained, in accordance with the instructions issued by the manufacturer/supplier or installer. Written records of the calibrations and maintenance shall be made and kept by the licensee.

5.14.2 The licensee shall maintain and clearly label and name all sampling and monitoring locations.

5.14.3 The wheel-wash shall be inspected on a daily basis and drained as required. Silt, stones and other accumulated material shall be removed as required from the wheel-wash and disposed of at the working face or to a skip.

REASON: To provide for appropriate operation of the facility to ensure protection of the environment.

CONDITION 6 EMISSIONS

6.1. No specified emission from the facility shall exceed the emission limit values set out in Schedule C: *Emission Limits*, of this licence. There shall be no other emissions of environmental significance.

6.2. The licensee shall ensure that the activities shall be carried out in a manner such that emissions do not result in significant impairment of, or significant interference with the environment beyond the facility boundary.

6.3. Landfill Gas

6.3.1. The following are the trigger levels for landfill gas emissions from the facility measured in any service duct or manhole on, at or immediately adjacent to the facility and/or at any other point located outside the body of the waste:

a) Methane, greater than or equal to 1.0% v/v; and

b) Carbon dioxide, greater than or equal to 1.5% v/v.

6.3.2. The concentration limits for emissions to atmosphere specified in this licence shall be achieved without the introduction of dilution air and shall be based on gas volumes under standard conditions of :-

a) in the case of landfill gas flare:

Temperature 273 K, pressure 101.3 kPa, dry gas at 3% oxygen; and

b) in the case of landfill gas combustion plant:

Temperature 273 K, pressure 101.3 kPa, dry gas; at 5% oxygen.

6.3.3. Emission limits for landfill gas emissions to atmosphere in this licence shall be interpreted in the following way:-

6.3.3.1. Continuous monitoring

(i) No 24 hour mean value shall exceed the emission limit value.

(ii) 97% of all 30 minute mean values taken continuously over an annual period shall not exceed 1.2 times the emission limit value.

(iii) No 30 minute mean value shall exceed twice the emission limit value.

6.3.3.2 Non-Continuous Monitoring

(i) For any parameter where, due to sampling/analytical limitations, a 30 minute sample is inappropriate, a suitable sampling period should be employed and the value obtained therein shall not exceed the emission limit value.

(ii) For all other parameters, no 30 minute mean value shall exceed the emission limit value.

(iii) For flow, no hourly or daily mean value shall exceed the emission limit value.

6.4. Emissions to Surface Water

6.4.1. Surface water emissions from the surface water pond shall only be made to the adjacent stream at a location agreed in advance by the Agency.

6.4.2. No raw leachate, treated leachate or contaminated surface water shall be discharged to the adjacent stream or any part of the Nanny River catchment.

6.4.3. No substance shall be discharged in a manner, or at a concentration which, following initial dilution causes tainting of fish or shellfish.

6.5. There shall be no direct emissions to groundwater.

6.6. Prior to the acceptance of waste at the facility, the licensee shall submit to the Agency four sets of groundwater monitoring results and establish trigger levels in accordance with the requirements of Directive 1999/31/EC.

6.7. Disposal of Leachate

6.7.1 Prior to accepting waste at the facility, the licensee must submit to the Agency for agreement details of an agreement between the licensee and a Sanitary Authority for accepting leachate from the facility at a waste water treatment plant.

6.8 Trigger Levels for PM_{10}

6.8.1 The trigger level for PM_{10} from the facility measured at any location on the boundary of the facility is:

a) PM_{10} greater than $50\mu g/m^3$ for a daily sample.

6.9 Noise Emissions

6.9.1 There shall be no clearly audible tonal component or impulsive component in the noise emissions from the facility at the facility boundary.

6.10 The licensee shall, not later than twelve months after the initial receipt of waste at this facility, submit proposals including timeframes to the Agency for agreement to undertake an

independent odour assessment. The odour assessment shall include but is not limited to the identification and quantification of any significant odour sources, an assessment of the suitability and adequacy of the control system(s) for odour sources and timescale for the assessment.

6.11 The licensee shall, not later than two months from the date of undertaking the odour assessment submit to the Agency an odour assessment report that shall make recommendations as appropriate. Any such recommendations arising out of the report shall be implemented within a timescale to be approved by the Agency.

6.12 Air Emission

The licensee shall install a continuous VOC monitor with directional information at the school (if agreed) otherwise at a location on a site agreed with the Agency. This requirement will be reviewed by the Agency on an annual basis.

REASON: To control emissions from the facility and provide for the protection of the environment

CONDITION 7 NUISANCE CONTROL

7.1 The licensee shall ensure that vermin, birds, flies, mud, dust, litter and odours do not give rise to nuisance at the facility or in the immediate area of the facility. Any method used by the licensee to control any such nuisance shall not cause environmental pollution.

7.2 The road network in the vicinity of the facility shall be kept free from any debris and deposited waste caused by vehicles entering or leaving the facility. Any such debris or deposited waste shall be removed without delay.

7.3 Litter Control

7.3.1 Litter fencing and netting shall be installed and maintained around the perimeter of the active tipping area prior to the disposal of any waste in any cell. The netting shall meet the guidance provided in the Agency's Manual on "Landfill Operational Practices". The height of the netting shall be minimised so as to not cause visual intrusion and the netting shall be kept tidy. Litter trapped in the netting shall be removed as soon as practicable. Portable litter nets/screens shall also be used at the active tipping face.

7.3.2 All litter control infrastructure shall be inspected on a daily basis. The licensee shall remedy any defect in the litter netting as follows:

a) a temporary repair shall be made by the end of the working day; and,

b) a repair to the standard of the original netting shall be undertaken within three working days.

7.3.3 All loose litter or other waste, placed on or in the vicinity of the facility, other than in accordance with the requirements of this licences, shall be removed, subject to the agreement of the landowners, immediately and in any event by 10.00am of the next working day after such waste is discovered.

7.3.4 The licensee shall ensure that all vehicles delivering waste to and removing waste and materials from the facility are appropriately covered.

7.4 Dust Control

7.4.1 From the commencement of construction of the facility the Dust Control Measures outlined in Sections 3.3.3, 4.2.2.1 and 4.2.3.1 Dust Emissions of the EIS shall be implemented at the facility.

7.4.2 In dry weather, site roads and any other areas used by vehicles shall be sprayed with water as and when required to minimise airborne dust nuisance.

7.4.3 All stockpiles shall be adequately contained to minimise dust generation.

7.5 Prior to exiting the facility, all waste vehicles shall use the wheelwash.

7.6 Bird Control

7.6.1 Birds shall be prevented from gathering on and feeding at the facility by the use of birds of prey and/or other bird scaring techniques. The birds of prey and/or other techniques shall be in place on the facility at least two weeks prior to any waste being disposed of and shall maintain their presence every day, from before dawn to after dark, until the waste activities cease and all the waste is capped to the written satisfaction of the Agency.

7.6.2 Within six months of commencement of waste activities, the licensee shall submit to the Agency for its agreement, an assessment of the effectiveness of the bird control measures at the facility. This assessment shall include, where required:

a) proposals for additional bird control measures;

b) method for assessing the effectiveness of such additional measures; and,

c) timescales for the implementation of such measures.

7.7 Vermin Control

7.7.1 The licensee shall apply the vermin control measures outlined in Section 3.3.7 'Vermin Control' of the EIS. Notwithstanding these measures, prior to the commencement of waste activities, the licensee shall submit to the Agency for its agreement a programme for the control and eradication of insect and rodent infestations at the facility. The programme should include as a minimum the following:

(a) details on the insecticides(s) and rodenticides(s) to be used;

(b) operator training;

(c) mode and frequency of application and measurers to contain sprays at the facility boundary;

(d) details on the precautions (including supporting documentation) to be taken to minimise the secondary poisoning of birds and other species from the use of the insecticides and rodenticides proposed;

(e) copies of any comments received from Dúchas on the vermin control proposed and;

(f) response proposed to complaints received about any vermin adjacent to the facility.

REASON: To provide for the control of nuisances.

CONDITION 8 MONITORING

8.1 The licensee shall carry out such monitoring and at such locations and frequencies as set out in *Schedule D: Monitoring*, of this licence and as specified in this licence. Unless otherwise specified by this licence, all environmental monitoring shall commence no later than two months after the date of grant of this licence.

8.2 The licensee shall amend the frequency, locations, methods and scope of monitoring as required by this licence only upon the written instruction of the Agency and shall provide such information concerning such amendments as may be requested in writing by the Agency. Such alterations shall be carried out within any timescale nominated by the Agency.

8.3 Monitoring and analysis equipment shall be operated and maintained in accordance with the manufacturers' instructions (if any) so that all monitoring results accurately reflect any emission, discharge or environmental parameter.

8.4 The licensee shall provide safe and permanent access to all on-site sampling and monitoring points and to off-site points as required by the Agency.

8.5 All persons conducting the sampling, monitoring and interpretation as required by this licence shall be suitably competent.

8.6 Landfill Gas

8.6.1 All landfill gas monitoring equipment, other than permanent monitoring systems within buildings, shall be certified as being intrinsically safe.

8.6.2 Landfill gas monitoring shall commence three months from date of placement of waste at the facility.

8.7 Noise Monitoring

8.7.1 Noise monitoring shall commence one month prior to the commencement of construction at the facility.

8.8 Groundwater Monitoring

8.8.1 Subject to the agreement of the well owners, all private wells within 1km of the landfill footprint shall be included in the monitoring programme set out in *Schedule D: Monitoring*, of this licence.

8.9 Surface Water Monitoring

8.9.1 The licensee shall implement a continuous monitoring programme for the water in the surface water pond. This programme shall include the criteria/trigger levels, which will determine which the automated penstock in the outlet from the surface water pond shall be closed. Such continuous monitoring shall, as a minimum, include conductivity, pH and TOC and shall be carried out on the inlet to the surface water pond at a monitoring location to be agreed by the Agency.

8.10 Topographical Survey

8.10.1 A topographical survey shall be carried out within eighteen months of the date of depositon of waste at the facility. The survey shall include a measurement of the remaining available void space. It shall be repeated annually thereafter. The survey shall be in accordance with any written instructions issued by the Agency.

8.11 Biological Assessment

8.11.1 An annual biological assessment of the Kentstown Stream and Nanny River shall be undertaken. This assessment shall use appropriate biological methods such as the EPA Q-rating system for the assessment of rivers and streams. The report shall include a map showing the location of monitoring points, each identified by a unique number and a twelve point grid reference. The scope, content and details of the contractor carrying out the assessment shall be submitted to the Agency for its agreement prior to the assessment.

8.12 Archaeological Assessment

8.12.1 Prior to the development of any undisturbed area, the holy well or farm building, the advice of Duchas the Heritage Service shall be sought. On completion of such development a report of the results of any archaeological monitoring shall be submitted to Duchas and to the Agency.

8.13 Stability Assessment

8.13.1 Within one year of the date of commencement of waste acivities, and annually thereafter, the licensee shall carry out a stability assessment of the side slopes of the facility.

8.14 Nuisance Monitoring

8.14.1 The licensee shall, at a minimum of one week intervals, inspect the facility and its immediate surrounds for nuisances caused by litter, vermin, birds, flies, mud, dust and odours.

8.14.2 The licensee shall within three months of the date of commencement of waste activities submit a programme to the Agency for agreement for the monitoring and assessment of odour emissions arising from the facility.

REASON: To ensure compliance with the conditions of this licence by provision of a satisfactory system of monitoring of emissions.

CONDITION 9 CONTINGENCY ARRANGEMENTS

9.1. In the event of an incident the licensee shall immediately:

a) identify the date, time and place of the incident;

b) carry out an immediate investigation to identify the nature, source and cause of the incident and any emission arising therefrom;

c) isolate the source of any such emission;

d) evaluate the environmental pollution, if any, caused by the incident;

e) identify and execute measures to minimise the emissions/malfunction and the effects thereof;

f) provide a proposal to the Agency for its agreement within one month of the incident occurring to:

i) identify and put in place measures to avoid reoccurrence of the incident; and

ii) identify and put in place any other appropriate remedial action.

9.2. The licensee shall, within six months of the date of grant of this licence, submit a written Emergency Response Procedure (ERP) to the Agency for its agreement. The ERP shall address any emergency situations which may originate on the facility and shall include provision for minimising the effects of any emergency on the environment. This shall include a risk assessment to determine the requirements at the facility for fire fighting and fire water retention facilities. The Fire Authority shall be consulted by the licensee during this assessment.

9.3. The licensee shall have in storage an adequate supply of containment booms and/or suitable absorbent material to contain and absorb any spillage at the facility. Once used the absorbent material shall be disposed of at an appropriate facility.

9.4. Emergencies

9.4.1. All significant spillages occurring at the facility shall be treated as an emergency and immediately cleaned up and dealt with so as to alleviate their effects.

9.4.2. No waste shall be burnt within the boundaries of the facility. A fire at the facility shall be treated as an emergency and immediate action shall be taken to extinguish it and notify the appropriate authorities.

9.4.3. In the event that monitoring of local wells indicates that the facility is having a significant adverse effect on the quantity and/or quality of the water supply this shall be treated as an emergency and the licensee shall provide and fund an alternative supply of water to those affected.

9.4.4. In the event that monitoring of the slide slopes of the facility indicate that there may be a risk of slope failure this will be treated as an emergency.

9.4.5. In the event that monitoring should indicate contamination of the site surface water in the Knockharley stream, the stream shall be diverted to the surface water lagoon.

9.5 After construction of the facility, or part thereof, and prior to the disposal of any waste in the facility or part thereof, and prior to the use of any infrastructure at the facility, an independent third party shall carry out a risk assessment of the facility, or part thereof, as agreed in advance with the Agency. The risk assessment shall pay particular regard to any accidents, emergencies, or other incidents, which might occur at the facility and their effect on the environment, on the neighbours of the facility and on adjoining land-uses. The assessment and recommendations, including a timescale for implementation, shall be submitted to the Agency for agreement. The agreed recommendations shall be implemented within the agreed timescale.

REASON: To ensure compliance with the conditions of this licence by provision of a satisfactory system of monitoring of emissions

CONDITION 10 RECORDS

10.1 The licensee shall keep the following documents at the facility office.

a) the current waste licence relating to the facility;

b) the current EMS for the facility;

c) the previous year's AER for the facility;

d) all written procedures produced by the licensee which relate to the licensed activities.

10.2 The licensee shall maintain a written record for each load of waste arriving at the facility. The licensee shall record the following:

a) the date;

b) the name of the carrier (including if appropriate, the waste carrier registration details);

c) the vehicle registration number;

d) the name of the producer(s)/collector(s) of the waste as appropriate;

e) the name of the waste facility (if appropriate) from which the load originated including the waste licence or waste permit register number;

f) a description of the waste including the associated EWC codes;

g) the quantity of the waste, recorded in tonnes;

h) the name of the person checking the load; and,

i) where loads or wastes are removed or rejected, details of the date of occurrence, the types of waste and the facility to which they were removed.

10.3 Written Records

The following written records shall be maintained by the licensee:

a) the types and quantities of waste recovered and disposed of at the facility each year. These records shall include the relevant EWC Codes;

b) all training undertaken by facility staff;

c) results from all integrity tests of bunds and other structures and any maintenance or remedial work arising from them;

d) details of all nuisance inspections; and

e) the names and qualifications of all persons who carry out all sampling and monitoring as required by this licence and who carry out the interpretation of the results of such sampling and monitoring.

10.4 The licensee shall maintain a written record of all complaints relating to the operation of the activity. Each such record shall give details of the following:

a) date and time of the complaint;

b) the name of the complainant;

c) details of the nature of the complaint;

d) actions taken on foot of the complaint and the results of such actions; and,

e) the response made to each complainant.

10.5 A written record shall be kept of each consignment of leachate removed from the facility. The record shall include the following:

a) the name of the carrier;

b) the date and time of removal of leachate from the facility;

c) the volume of leachate, in cubic metres, removed from the facility on each occasion;

d) the name and address of the Waste Water Treatment Plant to which the leachate was transported;

e) any incidents or spillages of leachate during its removal or transportation.

10.6 A written record shall be kept at the facility of the programme for the control and eradication of vermin and fly infestations at the facility. These records shall include as a minimum the following:

a) the date and time during which spraying of insecticide is carried out;

b) contractor details;

c) contractor logs and site inspection reports;

d) details of the rodenticide(s) and insecticide(s) used;

e) operator training details;

f) details of any infestations;

g) mode, frequency, location and quantity of application; and,

h) measures to contain sprays within the facility boundary.

REASON: To provide for the keeping of proper records of the operation of the facility.

CONDITION 11 REPORTS AND NOTIFICATIONS

11.1 Unless otherwise agreed by the Agency, all reports and notifications submitted to the Agency shall:

a) be sent to the Agency's Headquarters;

b) comprise one original and three copies unless additional copies are required;

c) be formatted in accordance with any written instruction or guidance issued by the Agency;

d) include whatever information as is specified in writing by the Agency;

e) be identified by a unique code, indicate any modification or amendment, and be correctly dated to reflect any such modification or amendment;

f) be submitted in accordance to the relevant reporting frequencies specified by this licence, such as in *Schedule E: Recording and Reporting to the Agency*, of this licence;

g) be accompanied by a written interpretation setting out their significance in the case of all monitoring data; and

h) be transferred electronically to the Agency's computer system if required by the Agency.

11.2 In the event of an incident occurring on the facility, the licensee shall:

a) notify the Agency as soon as practicable and in any case not later than 10.00 am the following working day after the occurrence of any incident;

b) submit a written record of the incident, including all aspects described in Condition 9.1(a-e), to the Agency as soon as practicable and in any case within five working days after the occurrence of any incident;

c) in the event of any incident which relates to discharges to surface water or groundwaters, notify Eastern Regional Fisheries Board as soon as practicable and in any case not later than 10:00am on the following working day after such an incident; and

d) Should any further actions be taken as a result of an incident occurring, the licensee shall forward a written report of those actions to the Agency as soon as practicable and no later than ten days after the initiation of those actions.

11.3 Waste Recovery Reports

11.3.1 Within six months of the commencement of waste activities at the facility, a report examining waste recovery options shall be submitted to the Agency for its agreement. This report shall address methods to contribute to the achievement of the recovery targets stated in national and European Union waste policies and shall include the following:

a) proposals for the contribution of the facility to the achievement of targets for the reduction of biodegradable waste going to landfills as specified in the Landfill Directive;

b) the separation of recyclable materials from the waste;

c) the recovery of Construction and Demolition Waste;

d) the recovery of commercial waste, including cardboard;

e) composting of biodegradable or green waste at the facility having regard to good practice and sustainability; and

f) Report on how the requirements of Condition 1.6 regarding treatment of Waste will be met.

11.4 Reports relating to Facility Operations

11.4.1. Leachate Handling Procedures

11.4.1.1 The licensee shall submit to the Agency for its agreement, prior to the use of the leachate storage lagoons, Handling Procedures for the handling of leachate which include (1) procedures for the handling of leachate during removal from the lagoons and subsequent transport/discharge to a Waste Water Treatment Plant and (2) monitoring infrastructure details and procedures for monitoring the level of leachate in the pump sumps, the cells and the lagoon.

11.4.2. Achievement of Final Profile

11.4.2.1 Within eighteen months of the date of grant of this licence, the licensee shall submit to the Agency for its agreement, proposals for landfilling and restoration to achieve the final profile/height of the facility to the Agency for its agreement.

11.4.3. Operation in Adverse Wind Conditions

11.4.3.1 Within three months of the date of grant of this licence the licensee shall submit to the Agency for its agreement proposals for the operation of the facility in adverse wind conditions.

11.5 Vermin and Flies

11.5.1. Prior to the commencement of waste activities, the licensee shall submit to the Agency for its agreement a proposal for the control and eradication of vermin and fly infestations at the facility. This proposal should include as a minimum, operator

training, details on the rodenticide(s) and insecticide(s) to be used, mode and frequency of application and measures to contain sprays within the facility boundary.

11.6 Monitoring Locations

11.6.1. Within one month prior to the placement of waste at the facility the licensee shall submit to the Agency an appropriately scaled drawing(s) showing all the monitoring locations that are stipulated in this licence. The drawing(s) shall include the reference code of each monitoring point.

11.7 Annual Environmental Report

11.7.1 The licensee shall submit to the Agency for its agreement, within thirteen months from the date of grant of this licence, and within one month of the end of each year thereafter, an Annual Environmental Report (AER).

11.7.2 The AER shall include as a minimum the information specified in *Schedule F: Content of Annual Environmental Report*, of this licence and shall be prepared in accordance with any relevant written guidance issued by the Agency.

REASON: To provide for proper report to and notification of the Agency.

CONDITION 12 CHARGES AND FINANCIAL PROVISIONS

12.1 Agency Charges

12.1.1 The licensee shall pay to the Agency an annual contribution of €29,937.00 or such sum as the Agency from time to time determines, towards the cost of monitoring the activity or otherwise in performing any functions in relation to the activity, as the Agency considers necessary for the performance of its functions under the Waste Management Act, 1996. The licensee shall in 2004 and subsequent years, not later than January 31 of each year, pay to the Agency this amount updated in accordance with changes in the Public Sector Average Earnings Index from the date of the licence to the renewal date. The updated amount shall be notified to the licensee by the Agency. For 2003, the licensee shall pay a pro rata amount from the date of this licence to 31st December. This amount shall be paid to the Agency within one month of the date of grant of this licence.

12.1.2 In the event that the frequency or extent of monitoring or other functions carried out by the Agency needs to be increased the licensee shall contribute such sums as determined by the Agency to defraying its costs.

12.2 Financial Provision for Closure, Restoration and Aftercare

12.2.1 The licensee shall arrange for the completion of a comprehensive and fully costed Environmental Liabilities Risk Assessment for the facility which will address liabilities arising from the carrying on of the activities to which this licence relates. A report on this assessment shall be submitted to the Agency for its agreement within six months of date of grant of this licence.

12.2.2 Within nine months of the date of grant of this licence, the licensee shall make a Proposal for Financial Provision to the Agency for its agreement to cover any liabilities incurred by the licensee in carrying on the activities to which this licence relates and in ceasing to carry on those activities. Such provision shall be maintained by the licensee unless otherwise agreed by the Agency.

12.2.3 The amount of financial provision, held under Condition 12.2.2 shall be reviewed and revised as necessary, but at least annually. Any proposal for such a revision shall be submitted to the Agency for its agreement.

12.2.4 The licensee shall within two weeks of purchase, renewal or revision of the financial provision required under Condition 12.2.2, forward to the Agency written proof of such indemnity.

12.2.5 Unless otherwise agreed any revision to the fund shall be computed using the following formula:

Cost = (ECOST x WPI) + CiCC

Where:

Cost = Revised restoration and aftercare cost

ECOST = Existing restoration and aftercare cost

WPI = Appropriate Wholesale Price Index [Capital Goods, Building & Construction (i.e. Materials & Wages) Index], as published by the Central Statistics Office, for the year since last closure calculation/revision.

CiCC = Change in compliance costs as a result of change in site conditions, changes in law, regulations, regulatory authority charges, or other significant changes.

12.3 The licensee shall ensure the costs in the setting up, operation of, provision of financial security and closure and after care for a period of at least 30 years shall be covered by the price to be charged for the disposal of waste at the facility.

REASON: To provide for adequate financing for monitoring and financial provisions for measures to protect the environment.

SCHEDULE A : Waste Acceptance

A.1 Waste Acceptance

Table A.1 Waste Categories and Quantities

WASTE TYPE	MAXIMUM (TONNES PER ANNUM)
Household	100,000
Commercial	45,000
Industrial	30,000
Sub Total **Waste for Disposal**	**175,000**
Construction & Demolition for recovery at the facility	25,000
TOTAL	**200,000**

SCHEDULE B : Specified Engineering Works

Specified Engineering Works
Development of the facility including preparatory works and lining.
Final capping.
Installation of Landfill Gas Management Infrastructure.
Installation of Leachate Management Infrastructure.
Installation of Groundwater Control Infrastructure.
Installation of Surface Water Management Infrastructure.
Any other works notified in writing by the Agency.

SCHEDULE C : Emission Limits

C.1 Noise Emissions: (Measured at the noise sensitive monitoring points indicated in Table D.1.1 Monitoring Locations).

Day dB(A) L_{Aeq}(30 minutes)	Night dB(A) L_{Aeq}(30 minutes)
55	45

C.2 Landfill Gas Concentration Limits: (Measured in any building on or adjacent to the facility).

Methane	Carbon Dioxide
20 % LEL (1% v/v)	1.5 % v/v

C.3 Dust Deposition Limits: (Measured at monitoring locations at or dust sensitive locations)

Level (mg/m^2 /day)[Note 1]
350

Note 1: 30 day composite sample with the results expressed as mg/m^2 /day.

C.4 Surface Water Discharge Limits: Measured at the discharge point from the surface water pond to the adjacent stream (grid reference to be submitted to the Agency).

Level (Suspended Solids mg/l)
35

C.5 Emission Limits Values for Landfill Gas Plant & Gas Flares

Emission Point reference nos: (to be agreed with the Agency)
Location: Landfill Gas combustion plant and flarestacks
Maximum volume to be emitted: $3000m^3$/hr
Minimum discharge height: 5m

Parameter	Emission Limit Value (Notes 3 &4)
Nitrogen oxides as (NO_2)	500 mg/m^3 (150mg/m^3) Note 1
CO	650 mg/m^3 (50mg/m^3) Note 1
Particulates	130 mg/m^3
TA Luft Organics Class I (Note 2)	20 mg/m^3 - at mass flows > 0.1 kg/hr (Not applicable) Note 1
TA Luft Organics Class II(Note 2)	100 mg/m^3 -at mass flows > 2 kg/hr (Not applicable) Note 1
TA Luft Organics Class III (Note 2)	150 mg/m^3 at mass flows > 3kg/hr (Not applicable) Note 1
Total Organic Carbon	10mg/m^3
Hydrogen Chloride	50 mg/m^3 - at mass flows > 0.3 kg/h)
Hydrogen Fluoride	5 mg/m^3 -at mass flows > 0.05 kg/h

Note 1: Emission limit values in brackets represent limit values for flare units.
Note 2: In addition to the above individual limits, the sum of the concentrations of Class I, II and III shall not exceed the Class III limits.
Note 3: These emission limit values may be revised with the agreement of the Agency on the basis of the technology employed.
Note 4: Dry gas referenced to 5% oxygen by volume for utilisation plants and 3% oxygen by volume for flares.

SCHEDULE D :Monitoring

Monitoring to be carried out as specified below.

D.1 Monitoring Locations

Monitoring locations shall be those as set out in Table D.1.1.

Table D.1.1 Monitoring Locations

LANDFILL GAS **Note 1 & 2**	DUST **Note 1 &5**	PM_{10} Note 1 &5	NOISE **Note 4 & 5**	SURFACE WATER **Note 5**	GROUND WATER **Note 1,2, 5 & 6.**	LEACHATE **Note 1 &2**	LANDFILL GAS FLARE Note 1
STATIONS	STATIONS	STATION	STATIONS	STATIONS	STATIONS	STATIONS	STATIONS
Perimeter boreholes at 50m intervals.	D1	North of the facility	N1	SW1	MW1d	Each active cell	To be agreed
Site office & other buildings	D2	East of the facility	N2	SW2	MW2d	Each storage lagoon	
Two boreholes per hectare within the waste mass	D3	South-west of the facility	N3	SW3	MW3d		
	D4	P4	N4	SW5	MW5d		
	D5	P5		SW6	MW6d		
	D6	P6		SW7	MW7d		
	D7			SW8	MW16d		
	D8				Private wells within 1km Note 3		
	D9						
	D10						

Note 1: The licensee shall, within one month prior to the placement of waste at the facility, submit to the Agency for agreement an appropriately sized and referenced drawing along with twelve digit national grid references for landfill gas, landfill gas combustion plant, additional surface water, dust, leachate and groundwater monitoring locations.

Note 2: This information shall be updated with the phased development of cells.

Note 3: Subject to the agreement of the owners / occupiers.

Note 4: The licensee shall, within one month of the date of grant of licence, submit to the Agency an appropriately sized and referenced drawing along with twelve digit national grid references for additional noise monitoring locations for agreement with the Agency.

Note 5: As per Figure J.1 Suggested Monitoring Locations submitted as Article 14 Response – April 2001. Additional locations to be agreed with the Agency.

Note 6. All private wells within 1km of the facility as per Condition 8.

Note 7. VOC monitoring location to be agreed with the Agency.

D.2 Landfill Gas

Table D.2.1 Landfill Gas Monitoring Parameters, Frequency and Technique

Parameter	Monitoring Frequency		Analysis Method[Note1]/Technique[Note2]
	Gas Boreholes/ Vents/Wells	Site Office	
Methane (CH_4) % v/v	Monthly	Continuous	Infrared analyser/flame ionisation detector
Carbon dioxide (CO_2)%v/v	Monthly	Continuous	Infrared analyser/ flame ionisation detector
Oxygen(O_2) %v/v	Monthly	Continuous	Electrochemical cell
Atmospheric Pressure	Monthly	-	Standard
Temperature	Monthly	-	Standard

Note1: All monitoring equipment used should be intrinsically safe.
Note 2 : Or other methods agreed in advance with the Agency.

D.3 Dust

Table D.3.1 Dust Monitoring Frequency and Technique

Parameter ($mg/m^2/day$)	Monitoring Frequency [Note 3]	Analysis Method/Technique
Dust	Monthly [Note 2]	Standard Method [Note 1]
PM_{10}	Quarterly	Standard Method [Note 2]

Note 1: Standard method VDI2119 (Measurement of Dustfall, Determination of Dustfall using Bergerhoff Instrument (Standard Method) German Engineering Institute). A modification (not included in the standard) which 2 methoxy ethanol may be employed to eliminate interference due to algae growth in the gauge.

Note 2: As described in prEN12341 "Air Quality - field test procedure to demonstrate reference equivalence of sampling methods for PM_{10} fraction of particulate matter" or an alternative agreed in writing with the Agency

Note 3: Monitoring shall commence one month prior to the commencement of construction of the facility.

D.4 Noise

Table D.4.1 Noise Monitoring Frequency and Technique

Parameter	Monitoring Frequency	Analysis Method/Technique
$L(A)_{EQ}$ [30 minutes]	**Quarterly**	Standard [Note 1]
$L(A)_{10}$ [30 minutes]	**Quarterly**	Standard [Note 1]
$L(A)_{90}$ [30 minutes]	**Quarterly**	Standard [Note 1]
Frequency Analysis(1/3 Octave band analysis)	**Quarterly**	Standard [Note 1]

Note 1: "International Standards Organisation. ISO 1996. Acoustics - description and Measurement of Environmental noise. Parts 1, 2 and 3."

D.5 Surface Water, Groundwater and Leachate

Table D.5.1 Water and Leachate - Parameters /Frequency

Parameter [Note 1]	SURFACE WATER Monitoring Frequency	GROUNDWATER [Note 9] Monitoring Frequency	LEACHATE Monitoring Frequency
Visual Inspection/Odour [Note 2]	Weekly	Quarterly	Quarterly
Groundwater Level	Not Applicable	Monthly	Not Applicable
Leachate Level	Not Applicable	Not Applicable	Weekly
Ammoniacal Nitrogen	Quarterly [Note 6]	Quarterly	Quarterly
BOD	Quarterly [Note 6]	Not Applicable	Quarterly
COD	Quarterly	Not Applicable	Quarterly
Chloride	Quarterly	Quarterly	Quarterly
Dissolved Oxygen	Quarterly	Quarterly	Not Applicable
Electrical Conductivity	Quarterly [Note 6]	Quarterly	Quarterly
PH	Quarterly [Note 6]	Quarterly	Quarterly
Total Suspended Solids	Quarterly [Note 6]	Not Applicable	Not Applicable
Temperature	Quarterly [Note 6]	Monthly	Quarterly
Boron	Not Applicable	Annually	Annually
Cadmium	Annually	Annually	Annually
Calcium	Annually	Annually	Annually
Chromium (Total)	Annually	Annually	Annually
Copper	Annually	Annually	Annually
Cyanide (Total)	Not Applicable	Annually	Annually
Fluoride	Not Applicable	Annually	Annually
Iron	Annually	Quarterly	Annually
Lead	Annually	Annually	Annually
List I/II organic substances [Note 3]	Note 8	Annually	Note 8
Magnesium	Annually	Annually	Annually
Manganese	Annually	Annually	Annually
Mercury	Annually	Annually	Annually
Potassium	Annually	Quarterly	Annually
Sulphate	Annually	Annually	Annually
Sodium	Annually	Quarterly	Annually
Total Alkalinity	Annually	Annually	Annually [Note 5]
Total Phosphorus / orthophosphate	Annually [Note 6]	Annually	Annually
Total Oxidised Nitrogen	Annually	Quarterly	Quarterly
Total Organic Carbon	Not Applicable	Quarterly	Not Applicable
Residue on evaporation	Not Applicable	Annually	Not Applicable
Zinc	Annually	Annually	Annually
Phenols	Not Applicable	Quarterly	Not Applicable
Faecal Coliforms [Note 4]	Not Applicable	Quarterly	Annually
Total Coliforms [Note 4]	Not Applicable	Quarterly	Annually
Biological Assessment	Annually [Note7]	Not Applicable	Not Applicable

Note 1: All the analysis shall be carried out by a competent laboratory using standard and internationally accepted procedures.

Note 2: Where there is evident gross contamination of leachate, additional samples should be analysed.

Note 3: Samples screened for the presence of organic compounds using Gas Chromatography / Mass Spectrometry (GC/MS) or other appropriate techniques and using the list I/II Substances from EU Directive 76/464/EEC and 80/68/EEC as a guideline. Recommended analytical techniques include: volatiles (US Environmental Protection Agency method 524 or equivalent), semi-volatiles (US Environmental Protection Agency method 525 or equivalent, and pesticides (US Environmental Protection Agency method 608 or equivalent).

Note 4: In the case where groundwater is extracted for drinking water, if there is evidence of bacterial contamination, the analysis at up gradient and downgradient monitoring points should include enumeration of total bacteria at 22°C and 37°C and faecal streptococci.

Note 5: Only to be analysed in instances of on-site treatment of leachate.

Note 6: Discharge of diverted surface water/groundwater shall be monitored on a monthly basis for these parameters unless flow in that month does not allow such monitoring.

Note 7: Appropriate biological methods (such as EPA Q-Rating System to be used for the assessment of rivers and streams).

Note 8: Once off for List I/II organic substances.

Note 9: All private wells within 1Km of the landfill footprint shall be analysed annually for ammonical N, K, Na, pH, electrical conductivity and TOC. A written report and interpretation shall accompany the analysis results.

D.6 Meteorological Monitoring

Table D.6.1 Meteorological Monitoring:
Data to be obtained from the on-site meteorological station. The location of the on-site meteorological station shall be in accordance with advice from Met Eireann and agreed in advance with the Agency.

Parameter	Monitoring Frequency	Analysis Method/Technique
Precipitation Volume	Daily	Standard
Temperature (min/max.)	Daily	Standard
Wind Force and Direction	Daily	Standard
Evaporation	Daily	Standard
Evapotranspiration	Daily	Standard
Humidity	Daily	Standard
Atmospheric Pressure	Daily	Standard

D.7 Landfill Gas Combustion Plant/Enclosed Flare

Location: Utilisation plant and enclosed flare (exact location of flare to be agreed with the Agency in advance).

Table D.7.1 Landfill Gas Utilisation Plant/Enclosed Flare Parameters and Monitoring Frequency

Parameter	Flare (enclosed)	Utilisation Plant	Analysis Method[Note1]/Technique[Note2]
	Monitoring Frequency	Monitoring Frequency	
Inlet			
Methane (CH_4) % v/v	Continuous	Weekly	Infrared analyser/flame ionisation detector/thermal conductivity
Carbon dioxide (CO_2)%v/v	Continuous	Weekly	Infrared analyser/ thermal conductivity
Oxygen (O_2) %v/v	Continuous	Weekly	Electrochemical/thermal conductivity
Total Sulphur	Annually	Annually	Ion chromatography
Total Chlorine	Annually	Annually	Ion chromatography
Total Fluorine	Annually	Annually	Ion Selective Electrode
Process Parameters			
Combustion Temperature	Continuous	Quarterly	Temperature Probe/datalogger
Outlet			
CO	Continuous	Continuous	Flue gas analyser/datalogger
NOx	Annually	Annually	Flue gas analyser
SO_2	Annually	Annually	Flue gas analyser
Particulates	Not applicable	Annually	Isokinetic/Gravimetric
TA Luft Class I, II, III organics	Not applicable	Annually	Adsorption/Desorption /GC/GCMS [Note 3]
TOC	Annually	Not applicable	Flame ionisation
Hydrochloric acid	Annually	Annually	Impinger / Ion Chromatography
Hydrogen fluoride	Annually	Annually	Impinger / Ion Chromatography

Note 1: All monitoring equipment used should be intrinsically safe.
Note 2: Or other methods agreed in advance with the Agency.
Note 3: Test methods should be capable of detecting acetonitrile, dichloromethane, tetrachlorethylene and vinyl chloride as a minimum

D.8 VOC Monitoring

Parameter	Monitoring Frequency	Analysis
VOC	Continuous	To be agreed with the Agency.

SCHEDULE E : Recording and Reporting to the Agency

Report	Reporting Frequency Note1	Report Submission Date
Environmental Management System Updates	Annually	One month after the end of the year reported on.
Annual Environment Report (AER)	Annually	Thirteen months from the date of grant of licence and one month after the end of each year thereafter.
Record of incidents	As they occur	Within five days of the incident.
Bund, tank and container integrity assessment	Every three years	Six months from the date of grant of licence and one month after end of the three year period being reported on.
Specified Engineering Works reports	As they arise	Prior to the works commencing.
Monitoring of landfill gas	Quarterly	Ten days after end of the quarter being reported on.
Monitoring of Surface Water Quality	Quarterly	Ten days after end of the quarter being reported on.
Monitoring of Groundwater Quality	Quarterly	Ten days after end of the quarter being reported on.
Monitoring of Leachate	Quarterly	Ten days after end of the quarter being reported on.
Meteorological Monitoring	Annually	One month after end of the year being reported on.
Dust Monitoring	Three times a year	Ten days after the period being reported on
Noise Monitoring	Bi-annually	One month after end of the year being reported on.
Any other monitoring	As they occur	Within ten days of obtaining results.

Note 1: Unless altered at the request of the Agency

SCHEDULE F : Content of the Annual Environmental Report

Annual Environmental Report Content
Reporting Period.
Waste activities carried out at the facility.
Quantity and Composition of waste received, disposed of and recovered during the reporting period and each previous year.
Calculated remaining capacity of the facility and year in which final capacity is expected to be reached.
Methods of deposition of waste.
Summary report on emissions.
Summary of results and interpretation of environmental monitoring.
Resource and energy consumption summary.
Proposed development of the facility and timescale of such development.
Volume of leachate produced and volume of leachate transported / discharged off-site.
Feasibility study on alternatives to treating leachate off-site
Report on development works undertaken during the reporting period, and a timescale for those proposed during the coming year.
Report on restoration of completed cells/ phases.
Site survey showing existing levels of the facility at the end of the reporting period.
Estimated annual and cumulative quantities of landfill gas emitted from the facility.
Annual water balance calculation and interpretation.
Report on the progress towards achievement of the Environmental Objectives and Targets contained in previous year's report.
Schedule of Environmental Objectives and Targets for the forthcoming year.
Full title and a written summary of any procedures developed by the licensee in the year which relates to the facility operation.
Tank, pipeline and bund testing and inspection report.
Reported incidents and Complaints summaries.
Review of Nuisance Controls.
Reports on financial provision made under this licence, management and staffing structure of the facility, and a programme for public information.
Report on training of staff.
Any other items specified by the Agency.
Treatment of waste received.

Sealed by the seal of the Agency on this the 19th day of March, 2003

PRESENT when the seal of the Agency
was affixed hereto:

Padraic Larkin, **Director/Authorised Person**

Archive.

Environmental Protection Agency
An Ghníomhaireacht um Chaomhnú Comhshaoil

Headquarters
P.O. Box 3000
Johnstown Castle Estate
County Wexford
Ireland

AMENDMENT A TO WASTE LICENCE

Licence Register Number:	146-1
Licensee	Celtic Waste Limited
Location of Facility:	Knockharley Landfill, Knockharley, Navan, County Meath (includes townlands of Tuiterath and Flemingstown).

Reason for the Amendment of Conditions

The Environmental Protection Agency has examined the terms of Waste Licence Reg. No. 146-1 as required by the provisions of Section 76(3)(a) of the Waste Management Acts 1996 to 2003, and determined that the licence can be brought into conformity with the provisions and requirements of Council Directive 96/61/EC by the exercise of the powers conferred by Section 76(4) of the Waste Management Acts 1996 to 2003.

The Environmental Protection Agency is satisfied, on the basis of the information available, that subject to compliance with the conditions of Waste Licence Reg. No. 146-1 granted on the 19/03/2003, as well as any amendments noted herein, any emissions from the activity will comply with and not contravene any of the requirements of Section 40(4) of the Waste Management Acts 1996 to 2003.

Amendment of Conditions

In pursuance of the powers conferred on it by Section 76(4) of the Waste Management Acts 1996 to 2003, the Agency amends Waste Licence Reg. No. 146-1, granted to Celtic Waste Limited, for a facility located at Knockharley, Navan, Co. Meath (includes townlands of Tuiterath and Flemingstown).

This amendment is limited to the following conditions of Waste Licence Reg. No. 146-1.

Amendments

Interpretation

BAT	Best Available Techniques.

To be inserted into the Interpretation of the existing licence.

Resource Use and Energy Efficiency

2.5 Resource Use and Energy Efficiency

2.5.1 The licensee shall carry out an audit of the energy efficiency of the site within one year of the date of grant of this amendment. The audit shall:-

(i) identify all opportunities for energy use reduction and efficiency;

(ii) be carried out in accordance with the guidance published by the Agency - "Guidance Note on Energy Efficiency Auditing"; and

(iii) be repeated at intervals as required by the Agency.

The recommendations of the audit will be incorporated into the Schedule of Environmental Objectives and Targets under Condition 2.3.2.1 above.

2.5.2 The licensee shall identify opportunities for reduction in the quantity of water used on site including recycling and reuse initiatives, wherever possible. Reductions in water usage shall be incorporated into the Schedule of Environmental Objectives and Targets.

2.5.3 The licensee shall undertake an assessment of the efficiency of use of raw materials in all processes, having particular regard to the reduction in waste generated. The assessment should take account of best international practice for this type of activity. Where improvements are identified, these shall be incorporated into the Schedule of Environmental Objectives and Targets.

To be inserted after Condition 2.4 of the existing licence.

Reason: ***To provide for the efficient use of resources and energy in all site operations.***

Accident Prevention and Emergency Response

9.6 The licensee shall, within twelve months of date of this amendment, ensure that a documented Accident Prevention Policy is in place, which will address the hazards on-site, particularly in relation to the prevention of accidents with a possible impact on the environment. This procedure shall be reviewed annually and updated as necessary.

9.7 The Emergency Response Procedure shall be reviewed annually and updated as necessary.

To be inserted after Condition 9.5 of the existing licence.

Reason: ***To provide for the protection of the environment.***

Restoration and Aftercare Plan

4.8 A final validation report to include a certificate of completion for the Restoration and Aftercare Plan, for all or part of the site as necessary, shall be submitted to the Agency within three months of execution of the plan. The licensee shall carry out such tests, investigations or submit certification, as requested by the Agency, to confirm that there is no continuing risk to the environment.

To be inserted after Condition 4.7 of the existing licence.

Reason: ***To provide for the restoration of the facility.***

These amendments should be read in conjunction with Waste Licence Reg. No. 146-1, granted on 19/03/2003.

Sealed by the seal of the Agency on this the11th day of October 2005

PRESENT when the seal of the Agency was affixed hereto:

Padraic Larkin, Director/Authorised Person

ATTACHMENT B.6

Notices and Advertisements

ATTACHMENT B.6 NOTICES AND ADVERTISEMENTS

A copy of the site notice, a drawing showing the location of the site notice (WLA01), and a copy of the newspaper notice with the notice outlined in red are appended overleaf.

Copies of correspondence notifying the Planning Authorities of this application are also appended to this Attachment.

FEHILY TIMONEY & COMPANY

CONSULTANTS IN ENGINEERING & ENVIRONMENTAL SCIENCES

CORK DUBLIN

Our Ref: Q:CE07/172/02/Lett026 to ABP/DOS/LY

The Secretary
An Bord Pleanala
64 Marlborough Street,
Dublin

19th December 2008

Re: Knockharley Landfill Waste Licence Review

Dear Sir/Madam

In accordance with Article 9 of the Waste Management (Licensing) Regulations (S.I. No. 395 of 2004), we would like to advise you that our client, Greenstar Holdings Ltd., is applying to The Environmental Protection Agency for a review of the waste licence for Knockharley Landfill (Reg No. W0146-01).

The application is for the review of the waste licence to increase the licensed rate of waste acceptance to 400,000 tonnes per annum for disposal. Save the increase in the volume of waste and an alteration to the landfill phasing sequence, the nature of the activity envisaged is essentially the same as the activity authorised under the existing waste licence. An Environmental Impact Statement (EIS) will accompany this application.

The text of the notice regarding this application published in the Meath Chronicle released on Wednesday 17th December 2008 is attached to this correspondence for your information.

You will be aware that a separate application for planning permission for this proposed development has been made to An Bord Pleanala in accordance with the Planning and Development (Strategic Infrastructure) Act 2006.

Yours sincerely

Declan O'Sullivan
for and on behalf of **Fehily Timoney and Company**

Encl

CORE HOUSE, POULADUFF ROAD, CORK, IRELAND
T: +353 21 4964133 F: + 353 21 4964464 E: info@ftco.ie W: www.fehilytimoney.ie

Directors: Eamon Timoney Declan O'Sullivan Gerry O'Sullivan Walter Quirke Oliver Tierney
Associates: Declan Egan Clodagh O'Donovan Adrian Duffy Bernadette Guinan
Paul Kelly Stephen Byrne Sarah Toal Tony Ambrose Company Secretary: Declan O'Sullivan

Registered in Ireland, Fehily Timoney & Company Ltd. Number 180497
Registered Office: Core House, Pouladuff Road, Cork. VAT Registration Number: IE6580497D

Newspaper Notice

APPLICATION TO THE ENVIRONMENTAL PROTECTION AGENCY FOR THE REVIEW OF A WASTE LICENCE

Notice is hereby given that Greenstar Holdings Ltd, Ballyogan Business Park, Ballyogan Road, Sandyford, Dublin 18 intends to apply to the Environmental Protection Agency (EPA) for the review of waste licence W0146-01 in respect of its Knockharley Residual Landfill, which is situated in the townlands of Tuiterath and Flemingstown and Knockharley, Navan, County Meath (National Grid Reference 2975E 2670N).

The classes of activity to which the application relates are set out in the Third and Fourth Schedules of the Waste Management Acts, 1996 to 2003, as follows.

Third Schedule.

Class 1. Deposit on, in or under land (including landfill)

Class 4. Surface impoundment, including placement of liquid or sludge discards into pits, ponds or lagoons

Class 5. Specially engineered landfill, including placement into lined discrete cells which are capped and isolated from one another and the environment

Class 6. Biological treatment not referred to elsewhere in this Schedule which results in final compounds or mixtures which are disposed of by means of any activity referred to in paragraphs 1 to 5 or paragraphs 7 to 10 of this Schedule

Class 13. Storage prior to submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where the waste concerned is produced.

Fourth Schedule

Class 2, Recycling or reclamation of organic substances which are not used as solvents

Class 4. Recycling or reclamation of other inorganic materials

Class 9. Use of any waste principally as a fuel or other means to generate energy

Class 11. Use of waste obtained from any activity referred to in a preceding paragraph of this Schedule

Class 13. Storage of waste intended for submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where such waste is produced.

The principal activity to be carried out on the site is the landfill of waste as defined at Class 5 of the Third Schedule of the Waste Management Acts, 1996 to 2003.

This application is for the review of the waste licence to increase the licensed rate of waste acceptance at the site from 200,000 tonnes to 400,000 tonnes per annum for disposal. Save the increase in the volume of waste and an alteration to the landfill phasing sequence, the nature of the activity envisaged is essentially the same as the activity authorised under the existing waste licence and involves the operation of a landfill site for the deposition of residual household, commercial and industrial waste, ancillary site administration building, weighbridges, wheelwash, gas management system, leachate lagoon and surface water pond. An Environmental Impact Statement (EIS) will accompany this application.

A copy of this application for the review of the waste licence, the EIS and such further information relating to it as may be furnished to the Agency will be available for inspection or purchase, as soon as is practicable after its receipt, at the Environmental Protection Agency's headquarters at PO Box 3000, Johnstown Castle Estate, Co. Wexford during normal working hours (Monday to Friday excluding Public Holidays).

FEHILY TIMONEY & COMPANY

CONSULTANTS IN ENGINEERING & ENVIRONMENTAL SCIENCES

CORK DUBLIN

Our Ref: Q:CE07/172/02/Lett026 to MCC/DOS/LY

County Manager
Meath County Council
County Hall
Navan
Co. Meath
Ireland

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SITE NOTICE

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N 268600

E-295700

N 268600

E-299200

N 266100

E-295700

N 266100

E-299200

CR384

National primary route - M2

To Slane

To Ashbourne

Existing overhead power lines 20kV

Existing overhead power lines 220kV

Existing overhead power lines 20kV

PHASE 7

PHASE 6

PHASE 5

PHASE 4

PHASE 3

PHASE 2

PHASE 1

AREA RESERVED FOR FUTURE BIOLOGICAL WASTE TREATMENT SINCE 2001 EIS

SITE NOTICE LOCATION

EXISTING GAS MAIN

Existing gas main

Community Hall

SITE PLAN

Scale 1:10560

0m 50.0m 100.0m 150.0m 200.0m 250.0m 300.0m 350.0m 400.0m 450.0m 500.0m

Scale 1:10560

Legend

- National Primary Routes
- National Regional Routes
- National County Routes
- Application Site Boundary
- Existing Water Courses
- Neighbouring Houses
- Overhead Powerlines
- Underground Gas Mains

Rev.	Drawn	Chkd	Appd	Date	Description
A	JC	SMcA	DOS	22.12.08	ISSUE FOR REVISION OF WASTE LICENCE

Revision History: A

Name of Client

greenstar

Name of Job

KNOCKHARLEY RESIDUAL LANDFILL SITE

Title of Drawing

SITE PLAN
SCALE 1:10560

Scales Used	This Drawing was printed to
1:10560	A3

Dwg. No.	Rev.
CE07-172-02-FIG-WLA-03	A

D:\ACAD\2007\CE07\172\02\CE07172202_FigWLA03

FEHILY TIMONEY & COMPANY
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Mill House, Ashtown Gate, Navan Rd, Dublin 15, Ireland.
T: +353-1-6583500, F: +353-1-6583501
W: www.fehilytimoney.ie, E: info@ftco.ie

ORIGINAL DRAWING SIZE A1 - (841 x 594)

NATURAL SCALE

CLASSIFIEDS

BOXED ADVERTISING
Contact: 046-9079656
Email: advertising@meathchronicle.ie
Deadline: 1.00 pm Monday

BLIC NOTICES

MEATH LOCAL AUTHORITIES
ÚDARÁIS ÁITIÚIL NA MÍ
Meath County Council &
The Town Councils of Navan, Trim & Kells

ath Local Authorities

EW YEAR HOLIDAY ARRANGEMENTS
PENING HOURS

of all Meath Local Authorities

ces of Meath Local Authorities:

exception to the arrangements for Motor Tax will close at 1.00pm on 30am on Tuesday 30th December 2008

Motor Tax Offices:

Closed at 12.00pm
Closed
Closed
Closed
Closed
Normal Hours
Closed
Closed
Normal Hours

ring our 24 Hour Emergency Line
1890 – 445- 335
of an emergency over the holiday period

inteach, ó na Comhairleoiri, ón mBainisteoir agus ón bhFoireann
léir i gComhairle Chontae na Mí

gement and Staff of Meath Local Authorities wish the people of ath a very happy and peaceful Christmas

ath County Council

CYCLING CENTRES
EW YEAR HOLIDAY ARRANGEMENTS
PENING HOURS

ing Centres in Kells, Navan and Trim over the Christmas period.

normal hours
closed at 1 p.m.
closed
closed
normal hours
normal hours
normal hours
closed at 1 p.m.
closed
normal hours
normal hours

Christmas Tree Recycling

e following locations from Monday 5th January until Saturday 17th January 2009.

hristmas trees at:

ath County Council

EVELOPMENT PLAN 2009 – 2013

Written Submissions Request

itten submissions for the next County Arts Development Plan. Submissions it of Arts policy and practice throughout Co. Meath and inform the direction

the following headings helpful;

person

ation/ Arts and Health/ Arts and Disability

unty Council Arts Office, Ashbourne Civic Office, Killegland Street, thcoco.ie

hairle Chontae na Mí

NANNA LIMISTÉIR ÁTIÚIL DO BHAILE GHIB
JS DO RÁTH CHAIRN
THA CHONTAE NA MÍ 2007-2013

de na hAchtanna um Pleanáil agus Forbairt 2000-2007

agus Forbairt 2000-2007 arna leasú, tugann Comhairle Chontae na Mí fógra histéir Áitiúil a ullmhú do BHAILE GHIB AGUS do RÁTH CHAIRN.
gach lonnaíocht a fhéachann ar shaincheisteanna suntasacha pleanála a dh orthu.

heacht/Tuairim A Chur Faoi Bhráid

leis seo d'aon pháirtithe leasmhara aighneachtaí a dhéanamh i ndáil duine a bhfuil a ainm/a hainm sínithe thíos roimh 3.30 pm an Luan irle na haighneachtaí nó na tuairimí sin a thabharfar sula ndéanfar na htaí nó tuairimí i bhformáid leictreonach a sheoladh ar ríomhphost chuig 30pm an Luan 19ú Eanáir 2009.

tuachóip nó ar ríomhphost, agus sin amháin, le do thoil. Ní bheidh aon dúblú heachtaí ar an ocáid sin agus déanfar an próiseas a shruthlíniú. Beifear buíoch inn na lonnaíochta lena mbaineann an aighneacht a mharcáil go soiléir ar na de d'aighneacht le do thoil.

go léir a bheidh faigthe i rith na tréimhse ama thuas agus na Pleananna

iniúchadh sna bhonaid seo a leanas le linn gnáthuaire oifige:

Mainistreach, An Uaimh.
arlann na hUaimhe, Sráid an Iarnróid, An Uaimh.

leáin, Ceannannas

ar fáil le ceannach ón Roinn Pleanála, Abbey Mall, Bóthar na Mainistreach, An Lynda Thornton @ 046- 9097566 nó lthornton@meathcoco.ie
ach Sinsearach, An Roinn Pleanála, Abbey Mall, Bóthar na Mainistreach, An

ath County Council

PUBLIC NOTICES

ALLIED WASTE MANAGEMENT SERVICES

CHRISTMAS COLLECTION ARRANGEMENTS 2008

The following are the alternative arrangements for the collection of Domestic Wheeled Bins during the Christmas Period. All other collections will take place as normal.

Arrangements for Christmas Day, Thursday 25th of December

- Waste Bins due to be collected in Mullagh Village on Thursday 25th of December will take place on Monday December 22nd. Recycling Bins due to be collected in Mullagh Village on Thursday 25th of December will take place on Saturday 20th of December.
- Collections due in all other areas on Christmas Day, Thursday 25th of December will take place on Saturday 20th of December

Arrangements for St. Stephens Day and New Years Day:

- Collections due on St. Stephens Day, in All Areas, on Friday 26th of December, will take place on Saturday 27th of December.
- Collections due on New Years Day, in All Areas, on Thursday 1st of January will take place on Saturday January 3rd.

Please Note: Bins must be out the night before to ensure early morning collection

Recycling Collection Calendars are now available on-line by logging onto www.alliedwaste.ie

We would like to thank all of our customers for their custom during 2008 and wish everyone a Happy Christmas and a Peaceful New Year

Lo-call 1890 255 433

APPLICATION TO THE ENVIRONMENTAL PROTECTION AGENCY FOR THE REVIEW OF A WASTE LICENCE

Notice is hereby given that Greenstar Holdings Ltd, Ballyogan Business Park, Ballyogan Road, Sandyford, Dublin 18 intends to apply to the Environmental Protection Agency (EPA) for the review of waste licence W0140-01 in respect of its Knockharley Residual Landfill, which is situated in the townlands of Tuiterath and Flemingstown and Knockharley, Navan, County Meath (National Grid Reference 2975E 2670N).

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Fourth Schedule

Class 2.	Recycling or reclamation of organic substances which are not used as solvents
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PUBLIC NOTICES

MEATH COUNTY COUNCIL
TEMPORARY CLOSURE OF ROADS
S.75 Roads Act, 1993 (Roads Regulations)

Notice is hereby given that Meath County Council intends to close L-7415-0 (Cr294) Donaghmore Lane to through traffic from its junction with the N51-203 Slane Road to its junction with R162-147 Kingscourt Road.

Reason:
The purpose of this Temporary Road Closure is to facilitate the Geotechnical Ground Investigation (Slit Trenches) for the Navan & Mid Meath Water Supply Scheme.

Duration:
It is proposed to close the road from:

(1) 8am on Monday 2nd February 2009 to 6pm on Sunday 15th February 2009

Alternative Route:
Traffic on the N51 Slane Road is to continue along the N51 into Navan to the roundabout and take the exit for R162 Kingscourt. Traffic is to continue along the R162-147 to the junction with the L-7415-0 (Cr294).

Note: Diversion signs will be in place.

Local Access:
Residents and property holders will be facilitated with access throughout the closure period.

Submissions and observations to the proposed temporary road closure should be made in writing to **Shane Donnelly, Navan Area Administrator, Navan Town Hall, Watergate Street, Navan, Co Meath no later than 12 noon on Thursday 15th January 2009.**

ATTACHMENT B.7

Type of Waste Activity

ATTACHMENT B.7 TYPE OF WASTE ACTIVITY

Table B.7.1 Relevant Activities in the Third Schedules of the Waste Management Acts 1996 to 2003

THIRD SCHEDULE Waste Disposal Activities
1. Deposit on, in or under land (including landfill). This is the primary current waste disposal activity and it will remain so. This activity is further described under Class 5 below.
4. Surface impoundment, including placement of liquid or sludge discards into pits, ponds or lagoons. Leachate is and will continue to be stored in a covered, lined lagoon prior to being either re-circulated or disposed of off-site. A surface water pond will continue to be used to control the quality and quantity of surface water run-off from the site.
5. Specially engineered landfill, including placement into lined discrete cells which are capped and isolated from one another and the environment. **P** This is the principal activity. To date all waste has been disposed of in lined cells. The current proposal is to increase the rate of filling thus lined cells will be developed and filled with waste more rapidly than heretofore.
6. Biological treatment not referred to elsewhere in this Schedule which results in final compounds or mixtures which are disposed of by means of any activity referred to in paragraphs 1 to 5 or paragraphs 7 to 10 of this Schedule. The licensee may, in time, elect to establish a small-scale leachate treatment plant for future biological pre-treatment of leachate to either augment or replace the current off-site disposal of leachate.
13. Storage prior to submission to any activity referred to in a preceding paragraph of this Schedule Waste deemed unacceptable for disposal in accordance with the waste acceptance criteria specified in Council Decision of 19th December 2002 (2003/33/EC) will be stored in the waste quarantine area pending disposal, treatment or recovery off-site.

Table B.7.2 Relevant Activities in the Fourth Schedule of the Waste Management Acts 1996 to 2003

FOURTH SCHEDULE Waste Recovery Activities
2. Recycling or reclamation of organic substances which are not used as solvents (including composting and other biological processes). Compost and other treated organic waste streams used for engineering purposes on the site.
4. Recycling or reclamation of other inorganic materials. Recovered C&D waste is and will continue to be used for engineering purposes such as daily cover, capping or road construction.
9. Use of any waste principally as a fuel or other means to generate energy. Landfill Gas is currently being collected and flared. The licensee proposes to establish gas-fuelled electricity generation as soon as a connection is provided by the ESB
11. Use of waste obtained from any activity referred to in a preceding paragraph of this Schedule. Recovered C&D waste is and will continue to be used for engineering purposes such as daily cover, capping or road construction
13. Storage of waste intended for submission to any activity referred to in a preceding paragraph of this Schedule Materials to be used for engineering purposes will be stored on-site prior to use.

ATTACHMENT C

Management of the Facility

ATTACHMENT C.1

Technical Competence and Site Management

ATTACHMENT C.1 TECHNICAL COMPETENCE AND SITE MANAGEMENT

Site Management Structure

The Site Management Structure as required by Condition 2.2.1 of the waste licence was submitted to the Agency on 14th December 2004, before the start of waste activities and has subsequently been updated in each AER.

The day to day management of the facility and supervision of waste activities are the responsibility of the Facility Manager, nominated Deputy Manager(s) and the site operatives. The positions and names of the persons who provide management and supervision are set out below: -

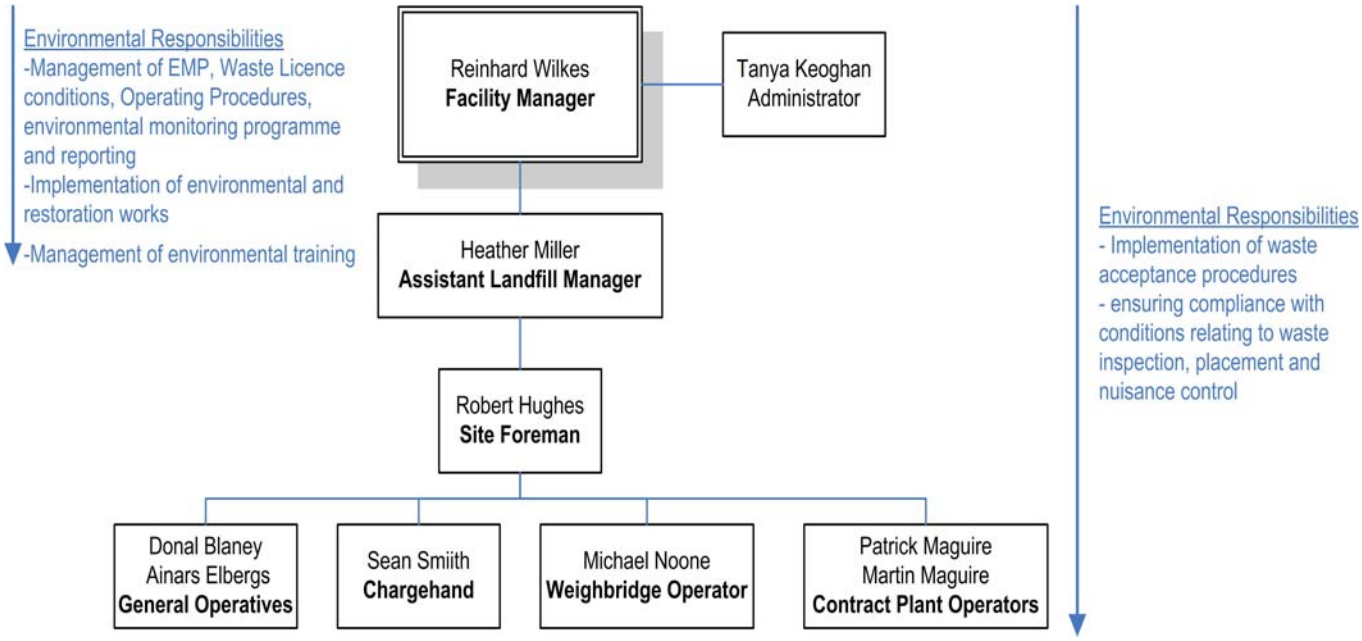
- Facility Manager, Reinhard Wilkes*
- Assistant Landfill Manager, Heather Miller
- Site Foreman, Robert Hughes*
- Chargehand, Sean Smith
- Weighbridge Operator, Michael Noone
- General Operatives, Donal Blaney and Ainars Elbergs
- Administrator, Tanya Keoghan

* Nominated Deputies

The following Plant Operators, including suitably experienced and qualified replacement staff will be supplied by the Plant Hire Contractor, Renton Plant: -

- Plant Operators, Patrick Maguire, Martin Maguire.

The organisation chart is presented overleaf.



Organisation Chart showing on-site management structure

Responsibilities

Greenstar, as the licensee, is responsible for ensuring that the requisite resources are provided to operate the facility in accordance with the objective of the Environmental Management Plan (EMP) and the Waste Licence conditions.

- The General Manager or nominated Deputy is responsible for ensuring that the day to day operation of the facility is carried out in accordance with the EMP, the Waste Licence conditions and the Operating Procedures.
- The General Manager or nominated Deputy is responsible for ensuring that the environmental monitoring programme is carried out and reports are submitted to the Agency in accordance with the schedule in the EMP and the Waste Licence conditions.
- The General Manager or nominated Deputy is responsible for arranging that the specified engineering works, the leachate, surface water and landfill gas management programmes and the restoration programmes are properly implemented.
- The General Manager or nominated Deputy is responsible for ensuring that the Corrective Action Procedures, Emergency Response Procedures and Contingency Arrangements specified in the EMP and the Waste Licence are implemented.
- The General Manager or nominated Deputy is responsible for arranging appropriate training programmes for all facility personnel and for maintaining training records.

- The General Manager, nominated Deputy and designated staff are responsible for implementing the waste acceptance procedures, including the assessment of suitability of the waste for disposal and recording the data specified in the Waste Licence. They are responsible for receiving and recording complaints from members of the public at the facility and informing the Facility Manager or nominated Deputy of the complaints.
- The General Manager, nominated Deputy, Site Foreman and designated staff are responsible for ensuring compliance with conditions relating to waste inspection, placement and nuisance control (e.g. daily cover, litter, dust, vermin, birds).

Staff Training

Training was carried out as scheduled in the training plan for 2007:

- Occupational First Aid Training for Site Foreman and one Operative
- FAS Waste Management Training for Charge hand and Assistant Manager
- Internal Auditor Training for ISO 14001 for Assistant Manager
- Regular Toolbox Talks for all staff
- CIWM Landfill Gas Management Course for General Manager
- Safety Management Course for General Manager and Site Foreman.

Any facility staff performing duties which involve interpretation of monitoring results or site inspections, receive the appropriate training by the General Manager or nominated deputy, prior to carrying out such duties.

All facility staff will receive further training in their individual areas of activity. This training will comprise theoretical sessions as well as practical training. All such training will be recorded and documented in individual training files.

ATTACHMENT C.2

Environmental Management System (EMS)

ATTACHMENT C.2 ENVIRONMENTAL MANAGEMENT SYSTEM (EMS)

Greenstar was required to submit a proposal for a documented environmental management system (EMS) to the Agency for its approval three months prior to the start of waste activities at the site, in accordance with Condition 2.3 of the waste licence. The EMS proposal completed as part of the Environmental Management Plan was sent to the Agency on the 23rd July 2004 and was approved on the 23rd December 2004. The letter of approval by the agency is appended overleaf. The EMS meets the ISO 14001 standards and the accreditation certificate is also appended overleaf. The ISO 140001 accreditation of the EMS was recently renewed for a further 3 years.

Ongoing monitoring of the facility in accordance with the existing waste licence ensures the ongoing assessment of the environmental performance of the site. In addition to this the EPA undertakes audits of the facility to ensure compliance with the conditions of the waste licence. To date the EPA has conducted four unannounced audits, all of which have been fully compliant.

Margaret Heavey
Greenstar Holdings Limited
Burton Court
Burton Hall Road
Sandyford
Dublin 18

23/12/04 Our Ref: 146-1/ak06dh

Dear Ms. Heavey

I refer to various correspondence submitted from and on behalf of Greenstar Holdings Limited, on dates as referred to below, in respect of your facility at Knockharley (W. L. Reg. No. 146-1) and including your request of 06/12/04 to commence waste acceptance at the facility.

Based on the information submitted and referred to below, following the site inspection of 03/12/04 (copy of Site Inspection Report enclosed) the Agency agrees to the commencement of waste acceptance at the facility subject to compliance with the conditions of your licence and those requirements set out below.

- Condition 3.2 - **CQA Reports for Phase 1: Cells 1-4, Leachate Lagoon & Stormwater Pond** [dated 06/09/04, 21/09/04 & 02/12/04 from Fehily Timoney & Company]. In accordance with Condition 5.1 the Agency agrees to the commencement of waste deposition in Cell No. 4. The intended commencement of use of Cells 1, 2 & 3 shall be notified in advance to the Agency.
- Condition 2.3.1 – **Proposal for documented Environmental Management System (EMS)** [dated 23/07/04 from O'Callaghan Moran & Associates] is agreeable to the Agency. The EMS is to be maintained on site for use and inspection by the Agency.
- Condition 9.5 – **Third Party Risk Assessment** [dated 04/11/04 from O'Callaghan Moran & Associates]. In addition to the assessment carried out further evaluation of drainage issues is to be undertaken to address complaints received with regard to flooding. Details of such shall be submitted to the Agency within one month of the date of this correspondence and include recommendations and relevant timescales for implementation for the agreement of the Agency.

- Condition 11.4.1 – **Leachate Handling Procedures** [dated November 2004 from Greenstar] are agreeable to the Agency. The requirements of Condition 5.10 are noted in this regard.
- Condition 3.21.1 – **Location of Meteorological Station** [dated 22/10/04 from Fehily Timoney & Company] is agreeable to the Agency.
- Condition 5.3.1 – **Waste Acceptance & Handling Procedures** [dated November 2004 from Greenstar] are agreeable to the Agency. The licensee's undertaking to submit a description of the individual waste treatment methods as part of the Waste Recovery Report to be submitted in accordance with Condition 11.3.1 is noted in this regard.
- Condition 7.7.1 & 11.5.1 – **Proposal for Vermin & Fly Control Procedures** [dated November 2004 from Greenstar] are agreeable to the Agency.
- Condition 6.6 – **Proposal for Groundwater Trigger levels.** The proposed methodology is agreeable to the Agency subject to the inclusion of trigger levels for TOC and Phenols and an annual review of the trigger levels to be carried out as part of the AER. Also, the proposed trigger limits do not appear to correspond with the methodology proposed. Within one month of the date of this correspondence submit details to clarify the figures in Table 2 and how they relate to the methodology proposed and include revisions to the proposed/specified trigger levels where necessary.
- Condition 6.7.1 – **Sanitary Authority Agreement to accept leachate** from the facility is agreeable to the Agency. Any changes/alternatives for the disposal of leachate must be agreed in writing in advance with the Agency.
- Condition 6.12 – **Proposal for Continuous VOC Monitoring** [dated 22/10/04 from Fehily Timoney & Company] is agreeable to the Agency. Submit details of the locations within one month of the date of this correspondence.
- Conditions 12.2.1 & 12.2.2 – **Environmental Liabilities Risk Assessment (ELRA) and Financial Provision including interim proposal for Financial Guarantee** [various correspondence from Greenstar (31/08/04, 31/08/04 & 25/11/04 (e-mail)), O'Callaghan Moran & Associates (30/08/04) and Bank of Ireland (23/12/04)] are agreeable to the Agency subject to

  (i) Submission of the Financial Guarantee (dated 23/12/04) to the Agency
  (ii) The licensee shall arrange for a suitable Financial Provision in line with the proposal of 31/08/04 and to be agreed with the Agency to be put in place prior to the expiration date of the Financial Guarantee.

If you have and queries in relation to any of the issues above please contact the undersigned at 01-2680100.

Yours sincerely

Mr Donal Howley
Office of Environmental Enforcement

Certificate IE05/66153

The management system of

Knockharley Landfill

Knockharley, Kentstown,
Co. Meath, Ireland

has been assessed and certified as meeting the requirements of

ISO 14001:2004

For the following activities

Landfilling of residual non hazardous, household, commercial and industrial wastes.

This certificate is valid from 22 December 2008 until 22 December 2011 and remains valid subject to satisfactory surveillance audits.
Re certification audit due before 22 August 2011
Issue 2. Certified since 22 December 2005

Authorised by

SGS United Kingdom Ltd Systems & Services Certification
Rossmore Business Park Ellesmere Port Cheshire CH65 3EN UK
t +44 (0)151 350-6666 f +44 (0)151 350-6600 www.sgs.com

SGS EMS 04 0308

ATTACHMENT C.3

Hours of Operation

ATTACHMENT C.3 HOURS OF OPERATION

(a) Proposed hours of operation

The proposed hours for waste management operations are

- 07:30 to 18:30, Monday to Saturday

(b) Proposed hours of waste acceptance/handling

The proposed hours for waste acceptance are

- 08:00 to 18:00, Monday to Saturday

(c) Proposed hours of any construction and development works at the facility and timeframes (required for landfill facilities)

The proposed hours for construction/maintenance operations are:

- 07:00 to 20:00, Monday to Friday
- 07:30 to 18:00, Saturday
- 07:30 to 16:00, Sunday (Maintenance only)

(d) Any other relevant hours of operation expected

Not applicable

ATTACHMENT C.4

Conditioning Plan

ATTACHMENT C.4 CONDITIONING PLAN

Knockharley has been in operation since December 2004. A conditioning plan is necessary only for landfills which had been granted permission or which were already in operation at the time of transposition of the Landfill Directive 1999/31/EC in 1999.

ATTACHMENT D

Infrastructure and Operation

ATTACHMENT D.1

Infrastructure

ATTACHMENT D.1 INFRASTRUCTURE

Site infrastructure is shown on Drawing WLA07.

D.1.b Site roads

The administration area is serviced by existing roads linked with a dedicated access road to the N2. It was always envisaged that a road around the perimeter of the cells would be progressively developed as cells are constructed. This proposal will accelerate the road construction to keep ahead of the land-filling programme. The road from the administration area to the cells will comprise 60mm wearing course bituminous macadam on an average 300mm thickness of Clause 804 road-base material.

D.1.d Plant

In addition to increasing the rate of waste deposition, this application proposes that the sequence of landfilling will change and that a second 'face' will be opened at the northern end of the site. In operational terms, residual municipal waste will continue to be deposited at the south end of the active void working north. It is proposed to develop a second working face at the north end of the landfill void starting at Phase 7 for the deposition of stabilised waste and other wastes suited for disposal separately to biodegradable waste. Both ends of the active void will be worked towards the centre of the void with capping and screening occurring on a phased basis (see Figure 1.2, EIS Volume 2 or Figure 1.2, Waste Licence Application Non-Technical Summary). This will necessitate duplication of some plant including:

- 47 tonne compactor
- 20 tonne excavator
- Small pumps and minor plant items

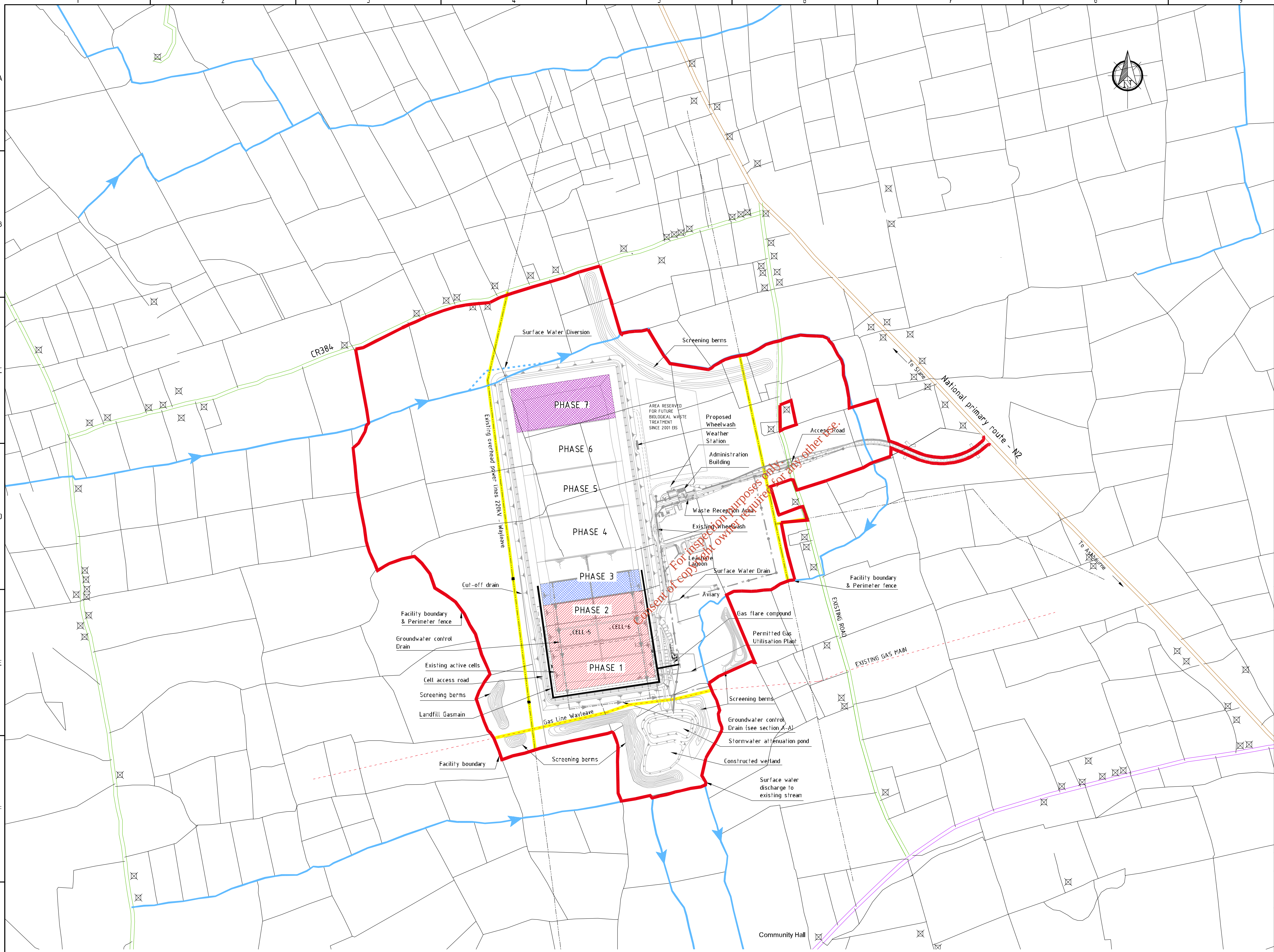
All ancillary infrastructure will be shared and therefore used more efficiently.

D.1.e Wheelwash

The existing wheelwash arrangement has operated successfully since the site opened in December 2004. The operation of a second face will require the installation of a second wheel washunit. A second dry shake-out of the same nature as the existing unit will be installed at the position shown on Drawing WLA07. The design of the proposed wheelwash is appended overleaf in Drawing WLA08.

D.1.s C&D Waste infrastructure

While there is no proposal for bespoke C&D waste management infrastructure, selected C&D waste will be set aside for uses such as cover material, permanent capping and road making. Such materials may be stockpiled on the floor of undeveloped cells.



SITE PLAN

Scale 1:10560

Legend

- National Primary Routes
- National Regional Routes
- National County Routes
- Application Site Boundary
- Constructed Area
- Area currently Being filled
- Proposed Filling Area
- Existing Water Courses
- Neighbouring Houses
- Overhead Powerlines
- Underground Gas Mains
- Wayleaves

Rev.	Drawn	Chk'd	App'd	Date	Description
A	JC	SMcA	DOS	Cork 22.12.08	ISSUE FOR REVISION OF WASTE LICENCE

Name of Client: greenstar

Name of Job: KNOCKHARLEY RESIDUAL LANDFILL SITE

Title of Drawing: SITE INFASTRUCTURE

Scales Used: 1:10560

This Drawing was printed to A3

Dwg. No.: CE07-172-02-FIG-WLA07

Rev.: A

Scale 1:10560

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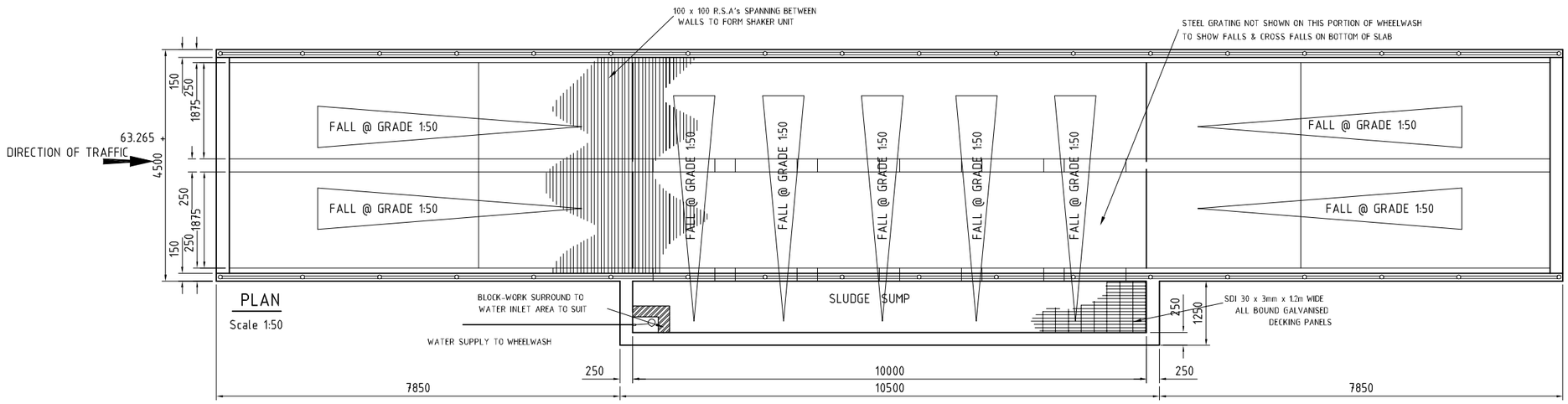
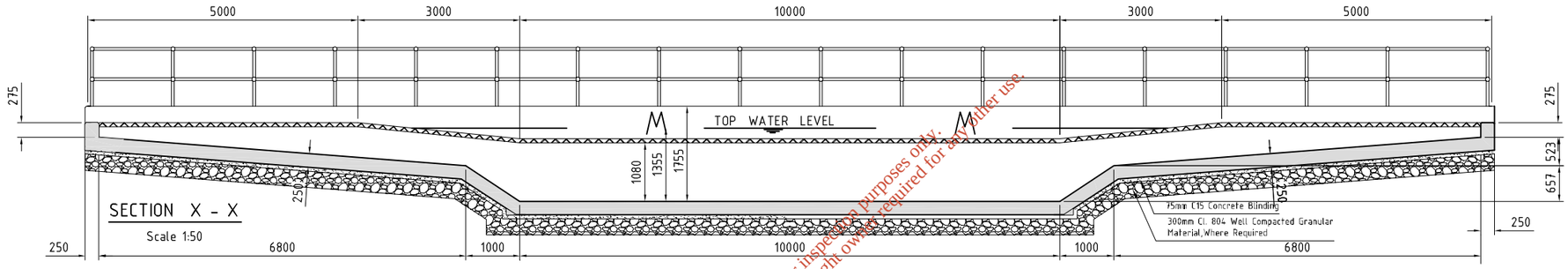
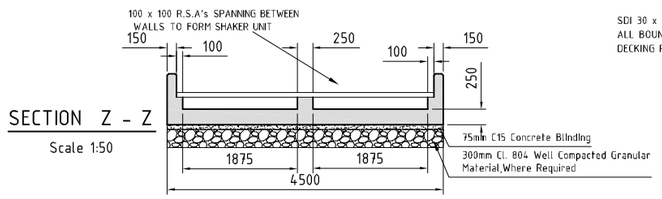
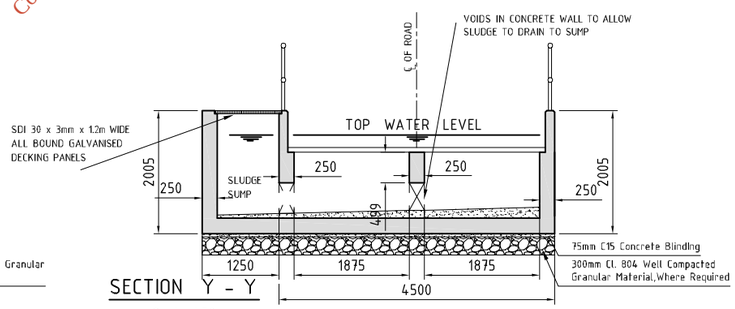
ORIGINAL DRAWING SIZE A1 - (841 x 594)

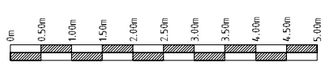
NATURAL SCALE











WHEELWASH
Scale 1:100

Rev.	Drawn	Chk'd	App'd	Rev Origin	Description
A	JC	SMcA	DO'S	Cork 22.12.08	ISSUE FOR REVISION OF WASTE LICENCE

Revision History: A

Name of Client: greenstar

Name of Job: KNOCKHARLEY RESIDUAL LANDFILL SITE

Title of Drawing: WHEELWASH

Scales Used: 1:100

This Drawing was printed to A3

Dwg. No.: CE07-172-02-FIG-WLA08

Rev.: A

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ORIGINAL DRAWING SIZE A1 - (841 x 594)

NATURAL SCALE

ATTACHMENT D.2

Facility Operation

ATTACHMENT D.2 FACILITY OPERATION

D.2.a

The facility operation is presented in Drawing WLA07 which illustrates the layout of the site with the landfill phases numbered.

The existing and proposed processes are described in Sections 3.2, 3.3 and 3.4 of the EIS.

In summary,

- The landfill comprises seven phases of four cells (i.e. 28 cells) all lined in accordance with the EU Council Directive on the Landfill of Waste.
    - Cells 1 to 4 (construction phase 1) were constructed in 2004 and landfilling commenced in December 2004.
    - Construction phase 2 works included the construction of Cells 5 & 6 in 2006.
    - Construction phase 3 works consisted of the construction of Cells 7 to 10 in 2007.
    - Preliminary capping works have commenced on Cells 1 to 6.

- Waste arrives at the weighbridge where it is weighed and its documentation is inspected. Waste handling aspects are also described in Attachment H.3.

- Waste is directed to the appropriate landfill face
    - Residual MSW will be directed to the current southern active cell
    - Stabilised wastes and wastes suited for disposal separately to biodegradable waste will be directed to the northern active face commencing in Phase 7
    - The waste will be tipped spread and compacted with a landfill compactor
    - On a daily basis, waste will be covered to minimise the risk of litter blow or attractiveness to flies, birds vermin etc.
    - In addition to the use of daily cover, supplementary odour control technology comprising fine-moist deodorising spray has been installed at the facility
    - As soon as practicable, waste will be covered with an intermediate cap, and in time a final cap will be installed
    - Returning trucks will pass over a wheel shake-out before being weighed out over the weighbridge
    - In the event that unacceptable waste is detected at the tipping face, it will be re-loaded and transported to the waste quarantine area.

- Landfill gas is captured using a combination of vertical and near-horizontal pipework and is currently flared at an enclosed landfill gas flare that commenced operation in December 2006. Planning permission was granted in April 2007 for installation and operation of a gas utilisation plant. The proposed plant will be phased and will generate up to 4.2MW of electricity for input into the national grid. Greenstar is awaiting connection to the national grid and it is envisaged

that the first gas engine will be installed and operational in 2009 pending the grid connection. The landfill gas will continue to be flared until such time as a connection is established by the ESB.

- The effect of fugitive gas emissions is mitigated using odour neutralisers as well as the use of daily cover in accordance with the provisions of the waste licence. Daily cover comprises a minimum of 150 mm soil-like material covered with a 100 mm deep layer of woodchip, the latter being a well documented medium used to treat odourous compounds in bio-filters. Before being covered the waste is compacted. The immediate compaction of the waste within a small controlled area serves to minimise the available area for odours to escape from the daily tipping area. The progressive development of the landfill gas collection and treatment infrastructure enhances odour control as landfill gas combustion effectively destroys its odourous compounds. A high density of landfill gas extraction points have been installed at the landfill that are connected to modern state-of-the-art gas flares. A gas-engine and generator will be installed at the site in the near future to utilise the gas.

- Leachate is contained by the lining system and systematically pumped to the fully-lined and covered leachate lagoon. Leachate is removed regularly by a licensed waste contractor to a wastewater treatment plant, thus minimising the potential for odours which can form as a result of leachate stagnating and becoming anaerobic.

- When permitted by the EPA, leachate may be re-circulated into the waste body (under the cap) so as to accelerate stabilisation of the waste mass.

- On completion of landfilling, both leachate and landfill gas management will continue until it is deemed by the EPA that the landfill no-longer poses a significant risk to the environment.

- Outside of the landfill footprint, surface water is directed to a lagoon before being discharged to the adjacent stream via a constructed wetland. In the event that significant surface water contamination occurs, continuously active monitoring equipment will close the lagoon discharge to prevent a pollution event.

- Ultimately, the entire waste mass will be covered and re-vegetated. The intensification of waste intake will not alter the final landform when compared with the current permitted development. Clearly, with this proposal, the final landform will be achieved sooner and this is seen as a positive impact. The development of the landfill to date has included the construction of berms and the planting of trees that are designed to limit the visual intrusion of the landfill within the local landscape.

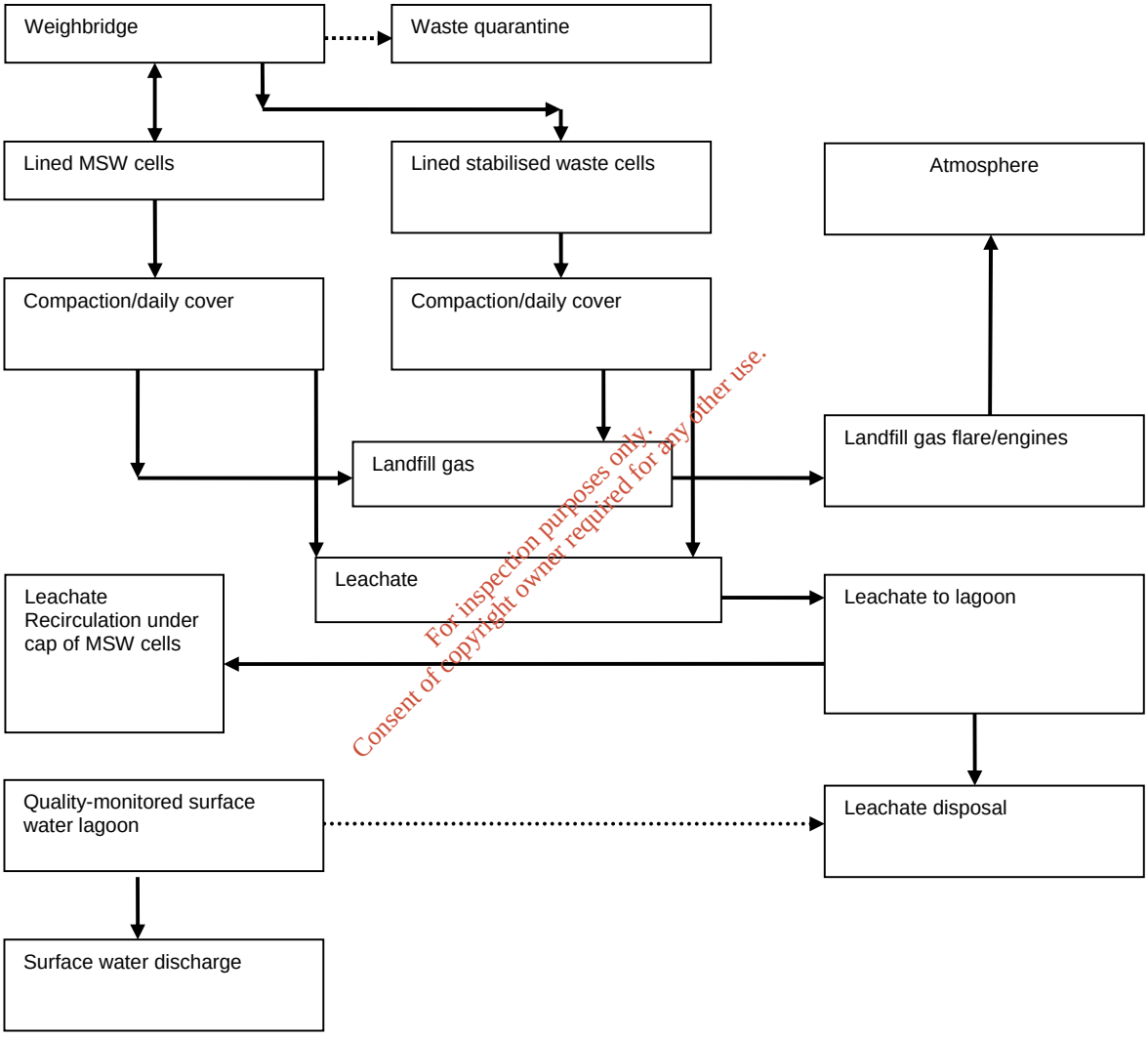
- The site's administration is housed in a dedicated office block and a weighbridge kiosk.

- Other relevant infrastructure includes
    - Fencing and security gates
    - Paved and un-paved roads

- Diesel bund
- Maintenance shed
- Weather station
- Aviary
- Back-up generator
- Environmental monitoring and control infrastructure
- Screening bunds
- Screening planting

D.2.b Flow Chart

A flow diagram of the landfill processes, along with a brief description detailing its management and maintenance plans is presented below.



Each of the systems identified in the chart require are managed and receive regular maintenance to ensure robustness and environmental protection.

- The weighbridge is maintained by the vendor and re-certified for accuracy as is required by law

- The waste quarantine area is kept clean with particular emphasis on drainage and water-tightness
- The lined cells are quality assured at construction stage, and particular care is taken during operation (filling) to protect the lining system. The top (crest) of the side-slopes are given particular attention to avoid damage.
- Daily cover is selected to avoid very-low permeability materials, and an adequate stock of oil like material is maintained on site.
- The waste handling plant is maintained in accordance with the manufacturers' recommendations
- The landfill gas flare is continuously monitored for performance with trained staff engaged if adjustments are necessary. The gas collection field is kept in balance by trained staff. Landfill gas monitoring boreholes are subjected to regular checks using factory-calibrated instrumentation. The gas detection equipment in the buildings is maintained by the suppliers
- The performance of the leachate handling contractor is monitored on a continuous basis
- Surface water quality is monitored both by continuous monitoring and laboratory analyses. The in-situ continuous-monitoring equipment is maintained and calibrated by the equipment manufacturers.

D.2.c Emissions

There is potential for the following emissions;

- Air (landfill gas and odour)
- Noise from operational plant traffic and construction plant
- Dust from traffic, waste handling and construction
- Leachate from waste disposal
- Contaminated water to surface or ground from spillages
- Litter either from waste transport or disposal

The facility was designed and is being operated in accordance with the EU Landfill Directive 1999/31/EC and the EPA Manuals on landfill selection, design, operation and monitoring. Comprehensive environmental controls and monitoring are presently in operation to mitigate the occurrence of any of the above emissions. Environmenal emissions from the site are limited by a set of emission limit values contained in the waste licence. The daily operation of the landfill facility is monitored as required under the waste licence and consists of a number of monitoring programmes that address groundwater, surface water and leachate quality, landfill gas, noise and deposition. The EPA has audited the Knockharley landfill site on four separate occasions with no non-compliances noted making it the most compliant landfill in the country. The mitigation measures are described in Sections 3 to 14 of the EIS. Further details on Emissions are presented in Attachment E.

D.2.d Laboratory

There is no laboratory on site, however, Greenstar employs contract laboratories to undertake routine analyses of surface water, groundwater, leachate and air in compliance with the waste licence.

There are a number of field instruments (both portable and fixed) that are used for day-to-day monitoring of air and water. Those instruments are routinely calibrated and certified for use. Copies of the certificates are retained on site.

D.2.e Incineration

This section is not applicable.

ATTACHMENT D.3

Liner System

ATTACHMENT D.3 LINER SYSTEM

D.3.a Annex 1 of Landfill Directive

The Landfill Directive stipulates in Annex 1:

> "*The landfill base and sides shall consist of a mineral layer which satisfies permeability and thickness requirements with a combined effect in terms of protection of soil, groundwater and surface water at least equivalent to the one resulting from the following requirements:*
>
> *- landfill for hazardous waste: K ≤ 1,0 × 10^{-9} m/s; thickness ≥ 5 m,*
>
> *- landfill for non-hazardous waste: K ≤ 1,0 × 10^{-9} m/s; thickness ≥ 1m,*
>
> *- landfill for inert waste: K ≤ 1,0 × 10^{-7} m/s; t thickness ≥ 1m,*
>
> *[m/s: meter/second.]*
>
> *Where the geological barrier does not naturally meet the above conditions it can be completed artificially and reinforced by other means giving equivalent protection. An artificially established geological barrier should be no less than 0,5 metres thick.*
>
> *3.3. In addition to the geological barrier described above a leachate collection and sealing system must be added in accordance with the following principles so as to ensure that leachate accumulation at the base of the landfill is kept to a minimum:*

LANDFILL CATEGORY	*non-hazardous*	*hazardous*
Artificial sealing layer	*required*	*required*
Drainage layer ≥ 0.5 m	*required*	*required"*

Leachate produced within the landfill is contained by a combination of the HDPE liner and the underlying low permeability clay liner both installed in accordance with condition 3.12 of the EPA licence. Furthermore, the site is underlain by a varying depth (12m to 21.5m) of very low permeability clay in the range of 1x10^{-5} m/sec to 4.6 x 10^{-11}. It is evident that the lining system at Knockharley, being exactly as specified by the Directive, is BAT.

D.3.b Details of Lining System

The lining system comprises

(i) a composite liner consisting of a 1 m layer of compacted soil with a hydraulic conductivity of less than or equal to 1x10^{-9}m/s, overlain by a 2 mm thick high density polyethylene (HDPE) layer;

(ii) a geotextile protection layer placed over the HDPE layer;

(iii) a 500 mm thick drainage layer placed over the geotextile layer with a minimum hydraulic conductivity of 1 x 10^{-3} m/s, incorporating leachate collection drains;

(iv) The side walls are constructed to achieve an equivalent protection. Comprising geomembranes, geotextiles and drainage geocomposites. It is proposed to omit the sidewall drainage geocomposite for all future cells.

The lining system for the leachate storage lagoon and the surface water pond comprises a composite liner consisting of a basal soil/clay layer of 1 m in thickness with a permeability of less than $1x10^{-9}$m/s overlain by a 2 mm thick high density polyethylene (HDPE) layer.

D.3.c/d QA/QC Plan for Lining System

Greenstar will adhere strictly to the liner QA process defined in the EPA Landfill Manual – Landfill Site Design. Specifically:

- Section 6.3 – Natural Clay
- Tables 6.3 to 6.7 – Testing frequencies
- Section 6.6 – Geomembranes
- Section 6.7 – Geomembrane Leak Detection
- Chapter 11 – QA/QC

Quality is controlled by Greenstar's insistence that only properly qualified personnel are employed in the installation of the lining system. The installation contractor must bring all aspects of the lining system to a condition that complies with the specification.

Quality is assured by Greenstar's consulting engineer and independent quality assurance specialist. For Phases 1 and 2 construction, Greenstar commissioned Fehily Timoney & Company as consulting engineer supported by Metlab. For Phase 3, Greenstar is employing Fehily Timoney & Company supported by Geomembrane Testing Services.

Greenstar will continue to engage specialist support on a Phase by Phase basis. The qualifications and experience of all support specialists will be given in the Phase-specific CQA submission.

D.3.e Third Party Supervision

As is required by condition 3.2 of the licence (and as discussed above), Greenstar will give details of third-party supervision, testing and controls etc on a phase by phase basis.

D.3.f Basal Gradients and Access Ramps

Basal Gradients
Drawing WLA 10 illustrates the proposed basal gradients that were used for Phase 3. The drawing also shows the liner levels which are 1m above the formation levels. The gradients are the same as those used for the previous phases and will not change for future phases. This drawing also shows the locations of access ramps.

Access Ramps
Two forms of access ramp are used as and when appropriate:

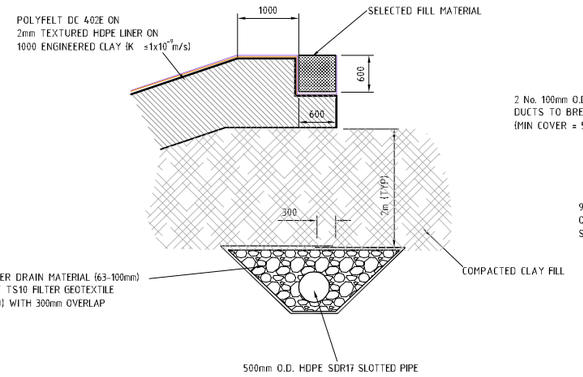
- A low-level ramp is constructed using material won on site so that cells can be accessed from the 'lower' side. Particular care is taken where the ramp bridges the cell perimeter bund. The low-level ramp is removed as subsequent cells are developed.
- As the cells fill, a high-level ramp is employed wherein a temporary road is constructed over filled cells leading towards the unfilled areas. Drawing WLA09 includes a typical cross-section of an access ramp.

D.3.g Leak Detection Surveys

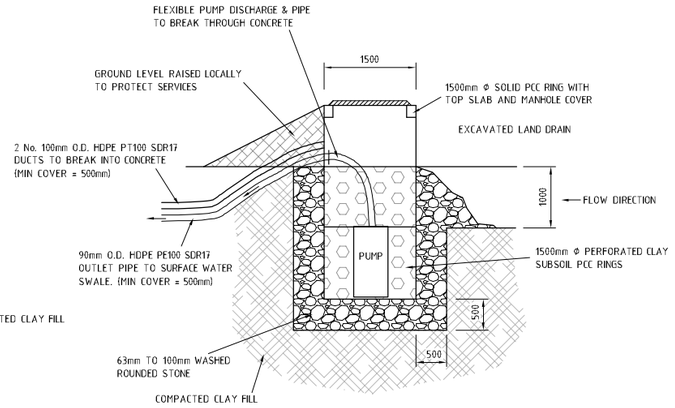
On completion of the lining system installation (particularly on completion of the placement of the stone drainage blanket) the lining system is tested using electrical resistivity.

This technique relies on the electrical conductivity associated with damage to the HDPE membrane. The test requires that the drainage blanket be saturated and isolated from adjacent soil.

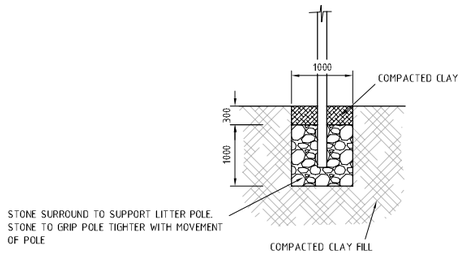
The test was undertaken in Phases 1 & 2 by Metlab, and by Geomembrane Testing Services Limited (GTS) in Phase 3. Any defects found in the liner were repaired and remedial repairs were retested and found to be satisfactory. The lining system was certified as free from all defects for all phases.



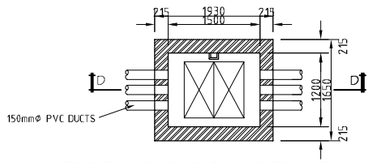
EASTERN LAND DRAIN



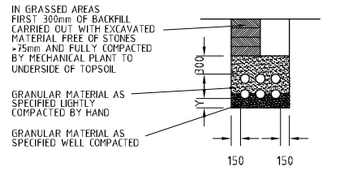
SURFACE WATER SUMP



LITTER FENCING DETAIL
POLE PLACED IN WASTE

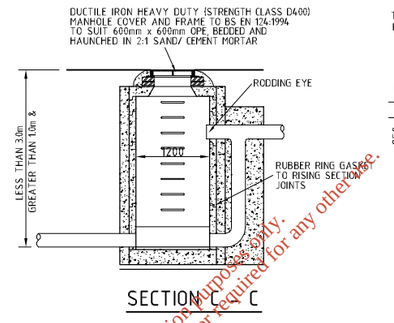


TYPE 2 CABLE CHAMBER - PLAN

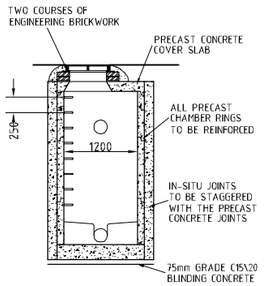


Y = 150mm FOR ALL DUCTS
NOTE: IN ROCK OR MIXED SOILS
CONTAINING BOULDERS OR
HARD SPOTS INCREASE PIPE
BEDDING DEPTH BY 100mm

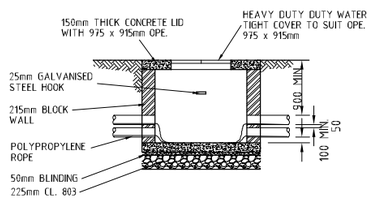
TYPICAL CABLE DUCT BEDDING DETAILS



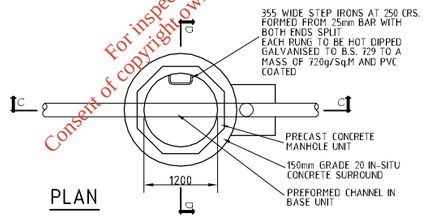
SECTION C - C



SECTION D - D

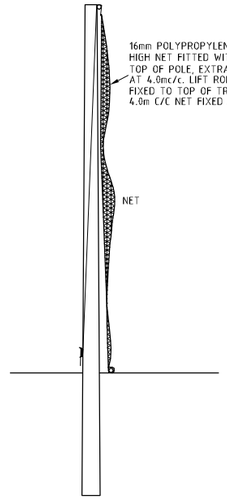


SECTION D - D

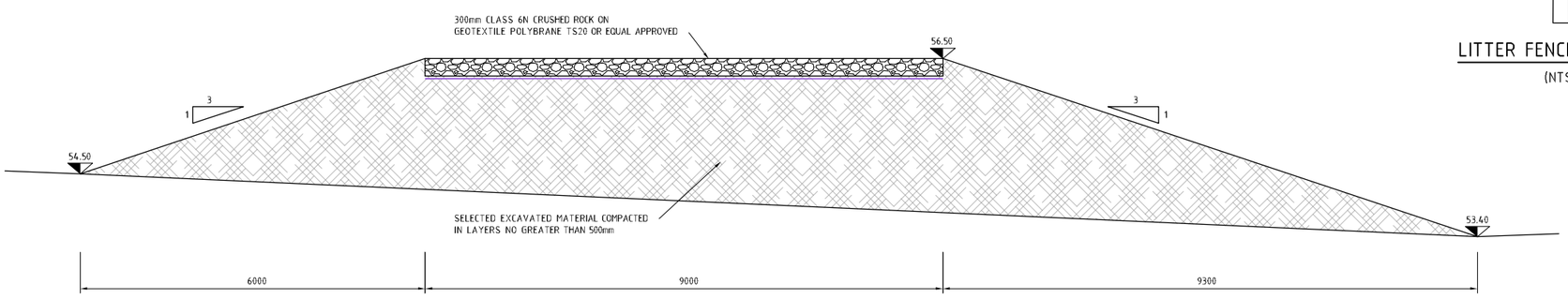


PLAN

TYPICAL MANHOLE DETAIL (1200mmΦ)
TYPE 1 (SUITABLE FOR 150 - 450mmΦ PIPES)



LITTER FENCING DETAIL
(NTS)



CELL ACCESS RAMP SECTION

ACCESS RAMP
Scale 1:100

0m 0.50m 1.00m 1.50m 2.00m 2.50m 3.00m 3.50m 4.00m 4.50m 5.00m
Scale 1:100

Rev.	Drawn	Chkd	Appd	Date	Description
A	JC	SMcA	DOS	Cork 22.12.08	ISSUE FOR REVISION OF WASTE LICENCE

Revision History: A

Name of Client: greenstar

Name of Job: KNOCKHARLEY RESIDUAL LANDFILL SITE

Title of Drawing: ACCESS RAMP & TYPICAL DETAILS

Scales Used: 1:100
This Drawing was printed to A3

Dwg. No. CE07-172-02-FIG-WLA09
Rev. A
O:\ACAD\2007\CE07\172-02\CE07172002_FIGWLA09

FEHILY TIMONEY & COMPANY
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LEGEND :

- Direction of Leachate flow to lagoon
- 2No. 250mm Ø O.D. HDPE PE100 SDR11 pipes to be used as electrical ducting
- Existing PCC pipe draining land drain
- 54.68 Proposed Level

PROPOSED SERVICES DUCTING & LEACHATE PIPEWORK TO CONNECT TO EXISTING
90mm O.D. HDPE PE100 SDR17 OUTLET PIPE
2No. 100mm Ø HDPE PE100 SDR17 DUCTS
SURFACE WATER SUMP
EXISTING GROUNDWATER COLLECTION PIPE TO BE EXTENDED 5m NORTH OF BERM
ENGINEERED CLAY TO BE CONSTRUCTED 3m TO NORTH OF BERM
20m WIDE GAP IN FENCING FOR VEHICLE ACCESS
PROPOSED LITTER FENCING
REFER TO SECTION ON DRG.No:CE07-172-03-105
9m WIDE ACCESS RAMP WITH 300mm 6F2 CRUSHED ROCK ON CLAY EMBANKMENTS
12m WIDE CROSSING (700mm Ø STEEL PIPE WITH MIN. 500mm COVER)
EXISTING CULVERT FOR LAND DRAIN
EXISTING GROUNDWATER COLLECTION PIPE TO BE EXTENDED 5m NORTH OF BERM
EXISTING LAND DRAIN TO BE FILLED WITH WASHED ROUNDED 63mm TO 100mm DRAINAGE STONE PLACED IN GEOTEXTILE WRAP
CELL SIDE SLOPES TO BE CONSTRUCTED OVER DRAIN
TO SURFACE WATER SWALE
HDPE SIDE RISER AND CONCRETE HEADWALL
1:113
1:90
1:115
SLOTTED 200mm O.D. HDPE PE100 SDR16 LEACHATE COLLECTION PIPES
PROPOSED CELL DIVISION BERMS
SLOPE BERM
EXTENT OF EXISTING SERVICES & LEACHATE PIPEWORK
PROPOSED SERVICES DUCTING & LEACHATE PIPEWORK TO CONNECT TO EXISTING
EDGE OF EXISTING ENGINEERED CLAY 1m FROM EDGE OF BERM
PROPOSED GAS VENTS
EXTENT OF ENGINEERED CLAY PREVIOUSLY CONSTRUCTED 1m NORTH OF BERM
EXISTING CELL DIVISION BERM
PROPOSED HDPE LEACHATE SIDE RISER
GV
CELL 5
CELL 6
CELL 7
CELL 8
CELL 9
CELL 10
62.00
61.00
53.30
53.76
54.13
54.68
53.00
60.00

Rev.	Drawn	Chk'd	App'd	Date	Description
A	JC	SMcA	DOS	Cork 22.12.08	ISSUE FOR REVISION OF WASTE LICENCE
Revision History	A				

Name of Client: greenstar

Name of Job: KNOCKHARLEY RESIDUAL LANDFILL SITE

Title of Drawing: CELLS 5-10 LAYOUT INCLUDING SERVICES

Scales Used: Scale 1:1000
This Drawing was printed to A3

Dwg. No.: CE07-172-02-FIG-WLA10
Rev.: A
O:\ACAD\2007\CE07\172\02\CE07172002_FIG-WLA10

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W: www.fehilytimoney.ie, E: info@ftco.ie

ORIGINAL DRAWING SIZE A1 - (841mm x 594mm)
NATURAL SCALE

ATTACHMENT D.4

Leachate Management

ATTACHMENT D.4 LEACHATE MANAGEMENT

D.4.a Leachate Management Plan

All efforts are made to minimise leachate production at Knockharley Landfill. In accordance with Condition 5.6.1 the active face is confined to a height of 2.5 m after compaction and a width of 25 m. The number of active cells are kept to a minimum as each day's waste input is deposited to form a 'block', which is compacted and covered daily. The following day a new 'block' of waste is deposited adjacent to this block. This ordered method of waste deposition enables areas which have been filled to be progressively restored over the site life, minimising the areas of active waste deposition. Once filling contours have been achieved a temporary cap is placed over the waste that reduces infiltration into the waste body and allows for rainfall to run off the temporary cap to the surface water drainage system. Leachate levels are maintained at less than 1 m above the level of the cell floor and leachate levels are constantly monitored by the on-site SCADA system. Leachate is pumped from the cells to the leachate lagoon as required. A freeboard of 0.75 m is maintained in the leachate lagoon at all times.

Leachate is tankered from the lagoon by a licensed haulier to the Farganstown Wastewater Treatment Plant located in Navan, Co. Meath. The plant is operated by Meath County Council. Leachate levels are managed for seasonal variations to ensure that adequate capacity is available in the lagoon during periods of traditionally wet weather. It is also ensured that leachate does not exceed 1m depth in the cells and that the lagoon freeboard is maintained.

Leachate management will continue post-closure as agreed with the Agency.

D.4.b Annual quantities of Leachate

Annual leachate volumes are derived from an average cell area of 8,907m^2. The leachate volume calculations are provided in Appendix 4 of the EIS. Details of leachate monitoring results indicating leachate composition are also presented in Appendix 4. The leachate prediction calculation has been adjusted to reflect actual experience since the site opened.

Table D.4.1 Predicted Annual Leachate generation

Year	Annual Leachate Generation (m^3)
1	8,016
2	16,033
3	25,652
4	33,668
5	34,873
6	33,672
7	40,687
8	34,677

Year	Annual Leachate Generation (m^3)
9	37,883
10	36,382
11	28,467
12	29,669
13*	18,548
14	12,937
15	8,430

D.4.c Total quantity of Leachate

Approximately 133,000 m^3 of leachate will be produced prior to the final capping works at the facility and leachate production will reach a steady state (estimated at 8,430 m^3 per year) after the final cell is capped. The estimate is based on 10% of the effective rainfall penetrating the cap. Good quality control should reduce the rainfall penetration. However, as landfills stabilise, settlement does occur thus the long-term leachate generation prediction uses this conservative figure of 10%.

D.4.d Details of cell sizes

An average cell area of 8,907m^2 was used to model the leachate production at the site and predict the future leachate generation at the facility. This area was used in the calculations to predict leachate generation based on the status of the cell (active/temporary cap/engineered cap) and rate of infiltration determined by the capping material used.

D.4.e Leachate Collection System

Slotted HDPE leachate collection pipes are laid on the floor of all cells. These collection pipes and the slope of the cell floor direct leachate to a sump construction in the low point of the cell. Leachate is pumped from the sump through a HDPE side riser pipe laid on the cell side slopes to the perimeter rising main which discharges to the leachate lagoon on site. The perimeter rising main will be extended/developed as additional cells are constructed. All leachate management structures will be inspected and certified fit for purpose on an annual basis as required by Condition 3.14.5 of the existing licence. Spare pumps are stored on site to facilitate urgent replacement in the case of a breakdown of operational pumps.

D.4.f Leachate Storage

The leachate storage lagoon was established before any waste was landfilled. In essence, it comprises a trapezoidal tank formed by excavating into the ground. The lagoon floor and sides are lined to the same specification as the landfill with the exception of the absence of a granular protection layer. The lagoon is covered with a floating HDPE sheet, fully welded to the basal liner. The cover prevents odour and aerosols from escaping as well as eliminating unnecessary leachate generation due to rainfall on the lagoon itself.

The maximum capacity of the lagoon is 2,493m^3 however if freeboard of 750 mm is taken into account, that reduces to 1,604m^3.

D.4.g Leachate Levels

The depth of leachate in each cell and in the leachate lagoon is monitored using pressure sensors on the cell floors. The signal is transmitted to the site's SCADA system that enables alarmed settings and pump starts as well as monitoring and recording the rise and fall of leachate within the cells/lagoon.

D.4.h Leachate Recirculation,

Pipework, pumps and valving is installed to facilitate leachate recirculation. Re-circulation will be controlled by the SCADA system. The licence states:

"Re-circulation of leachate or other contaminated water shall not be undertaken without the prior agreement of the Agency and shall only be undertaken within cells which have been lined and capped to the satisfaction of the Agency"

In due course, Greenstar will present proposals to the Agency in relation to the commencement of leachate re-circulation.

D.4.i On-site Leachate Treatment

On-site leachate treatment has not been specified but it may in time be viable as new technologies become available. For that reason, Activity 6 is licensed and it is proposed that it remains licensed.

If on-site leachate treatment is considered in the future, Greenstar will present detailed proposals to the Agency as proposed specified engineering works.

D.4.j Leachate Removal

(a) Quantities being removed

The leachate quantity removed during 2007 was 13,362 m^3 and the quantity removed in January to November 2008 was 13,800 m^3.

(b) Name of undertaker.

Leachate is tankered off site by Panda Waste Services, Rathdrinagh, Beauparc, Co. Meath.

(c) Details of transportation method.

Leachate is removed offsite by arctic tanker which holds approx. 27 m^3 and rigid tanker holding approx.18 m^3.

(d) Off-site treatment used.

Co-treatment with municipal sewage in an aerobic biological wastewater treatment

(e) Location of treatment plant.

Meath County Council Farganstown Wastewater Treatment Plant, Navan, Co. Meath.

(f) Name of treatment undertaker.

Meath County Council.

(g) Location of ultimate disposal.

As above.

(h) Final method of disposal.

As above.

(i) Consignment arrangements, relevant permits, licences and written agreements of acceptance of leachate.

Panda Waste Services waste collection permit WCP/MH/2001/01D which includes EWC 190703.

The written agreement with Meath County Council is provided overleaf.

Meath County Council

Tel: 046 - 9075571 / 9075573 / 9070394

Mobile: 087 - 8173912

E - mail: fduffy@meathcoco.ie

Navan Wastewater Treatment Works

Farganstown, Boyne Rd, Navan, Co. Meath

Tel: 046 - 9028652

Fax: 046 - 9028651

RECEIVED

06 OCT 2004

Secretary,
***greenstar* Holdings Ltd.,**
Unit 6, Ballyogan Business Park,
Sandyford,
Dublin 18

30th September 2004

Re; Disposal of Leachate from Knockharley Landfill Site to Wastewater Treatment Plant, Farganstown, Navan

Following a meeting on the 3rd September 2004 attended by Mr. Greg Duggan, Senior Engineer, Environment Section, Mr. Reinhard Wilkes, Landfill Manager of your Knockharley site and the writer. Meath County Council wishes to advise that they have no objection in principle to the disposal of leachate from this landfill site to Meath County Council's treatment plant. The following arrangements are to be noted.

(1) The availability of this disposal facility will be subject to review after six months
(2) Charges will be based on the COD levels of leachate received at inlet to treatment plant and will be reviewed after six months.
(3) Prior notice of intention to discharge to be agreed with plant caretakers in advance.
(4) Discharge to be via Baur connection at inlet works, where flows are metered.
(5) Random sampling to be carried out by our Laboratory staff at discharge inlet
(6) Charges for processing of leachate will be broadly along the lines as discussed and payment methods to be agreed in advance.
(7) Tankerage to be by an authorised waste collection permit holder.
(8) Meath County Council will require that tankerage contractor has in place insurance indemnity cover for public liability of at least €6,500,000

I trust you find all of the above to your satisfaction and should you require any further information or clarification regarding this matter please do not hesitate to contact the undersigned

Fergus Duffy
Operations Manager
O & M Section
Infrastructure

ATTACHMENT D.5

Landfill Gas Management

ATTACHMENT D.5 LANDFILL GAS MANAGEMENT

D.5.a Landfill Gas Management Plan.

As the waste is placed in the lined cells, gas-vents are constructed to allow gas to be collected and managed. The gas vents are connected to a flare located at the gas flare compound, that combusts the gas.

All waste has and will be placed in fully lined cells, isolated from the environment. The lining system is a barrier to both leachate and landfill gas. There are thus no additional risks of landfill gas migration associated with the proposed intensification of the disposal rate. Landfill gas monitoring is conducted in accordance with Condition 6 and Schedules C and D of the waste licence. The 2006, 2007 and 2008 landfill gas monitoring results are presented in Appendix 5 of the EIS.

The monitoring of fugitive emissions of landfill gas is carried out on a quarterly basis or as appropriate by means of PID surveys as described in the Odour Control and Monitoring Procedure KNKP 31.

Monitoring has confirmed that there is no migration of landfill gas.

Site buildings are monitored continuously for landfill gas by means of a continuous gas detection system. A gas analyser is permanently available on site and is used for spot checks should the need arise.

Any breakdown in the system is treated as an emergency and the landfill gas management contractor is brought on site. Apart from the fully enclosed landfill gas flare, the site also retains two 'open' gas flares for emergency use. Flares require electricity power, and the site is equipped with a stand-by generator.

The predicted quantities of gas likely to be produced at Knockharley based on an intensified waste intake are given in section 3.4.2 of the EIS and are also presented in Table D.5.2 below. These predictions are made using LandGem Landfill Gas emissions Model version 3.02 ad the model outputs are presented in Appendix 5 of the EIS. Table D.5.1 shows the methane emissions in tonnes per year for the Irish landfill facilities included on the European Pollution and Emissions Register (EPER) for 2004. The predicted quantities of gas modelled for Knockharley in Table D.5.2 are converted to tonnes of methane emissions to facilitate benchmarking against the list of Irish Landfills included in the EPER.

Gas management will continue post-closure as agreed with the Agency.

Table D.5.1 EPER Methane emissions 2004 from Irish Landfill facilities

Facility	Methane emission to air
Arthurstown Landfill	1,160.00 t
Bailieborough Landfill	139.00 t
Balbane Landfill Site	237.00 t
Ballaghaderreen Landfill	403.00 t
Ballaghveny Landfill	2,950.00 t
Balleally Landfill	3,830.00 t
Ballyguyroe Landfill Site	466.00 t
Ballymurtagh Landfill Facility	330.00 t
Ballynacarrick Landfill Site	1,010.00 t
Ballyogan Landfill Facility Ballyogan Recycling Park	3,220.00 t
Benduff Landfill Site	548.00 t
Carrick On Shannon Landfill	211.00 t
Central Waste Management Facility	198.00 t
Churchtown Landfill	361.00 t
Corranure Landfill	810.00 t
Derrinumera Landfill	416.00 t
Derryclure Landfill	991.00 t
Derryconnell Landfill Site	345.00 t
Donohill Landfill	1,310.00 t
Doora Landfill Site	1,270.00 t
Dundalk Landfill & Civic Waste Facility	2,520.00 t
Dungarvan Waste Disposal Site	1,070.00 t
Dunmore Landfill	407.00 t
Dunsink Landfill aka Dunsink Civic Amenity	739.00 t
East Cork Landfill Site	1,550.00 t
Gortadroma Landfill Site	1,550.00 t
Kerdiffstown Landfill	682.00 t
Kilbarry Landfill Site	1,870.00 t
Killurin Landfill Site	289.00 t
Kinsale Road Landfill	3,500.00 t
KTK Landfill Limited	518.00 t
Kyletalesha Landfill	1,920.00 t
Longpavement	640.00 t
Mohill Landfill	103.00 t
North Kerry Landfill Site	247.00 t
Pollboy Landfill Facility	176.00 t
Powerstown Landfill Site	438.00 t
Raffeen Landfill Site	1,040.00 t
Rampere Landfill	237.00 t
Rathroeen Landfill	965.00 t
Roscommon Landfill Facility	510.00 t
Scotch Corner Landfill	795.00 t
Silliot Hill Landfill	470.00 t
Tramore Waste Disposal Site	1,070.00 t
Whiteriver Landfill Site	771.00 t
Youghal Landfill	713.00 t

Table D.5.2 Projected total landfill gas and methane emission from Knockharley landfill 2008 to 2028 (LandGem Landfill Gas Emissions Model version 3.02)

Year	Total landfill gas	Methane	Methane
	m^3 per year	m^3 per year	tonnes per year
2008	6.267E+06	3.134E+06	2.13E+01
2009	8.156E+06	4.078E+06	2.77E+01
2010	1.241E+07	6.206E+06	4.22E+01
2011	1.596E+07	7.982E+06	5.43E+01
2012	1.934E+07	9.670E+06	6.58E+01
2013	2.255E+07	1.128E+07	7.67E+01
2014	2.561E+07	1.280E+07	8.71E+01
2015	2.852E+07	1.426E+07	9.70E+01
2016	3.128E+07	1.564E+07	1.06E+02
2017	3.391E+07	1.696E+07	1.15E+02
2018	3.434E+07	1.717E+07	1.17E+02
2019	3.266E+07	1.633E+07	1.11E+02
2020	3.107E+07	1.553E+07	1.06E+02
2021	2.955E+07	1.478E+07	1.01E+02
2022	2.811E+07	1.406E+07	9.56E+01
2023	2.674E+07	1.337E+07	9.09E+01
2024	2.544E+07	1.272E+07	8.65E+01
2025	2.420E+07	1.210E+07	8.23E+01
2026	2.302E+07	1.151E+07	7.83E+01
2027	2.189E+07	1.095E+07	7.45E+01
2028	2.083E+07	1.041E+07	7.08E+01

Landfill Gas Extraction

Extraction of landfill gas is carried out through vertical wells, progressively constructed and retrofitted as required, as well as horizontal extraction wells.

Vertical wells

Vertical landfill gas extraction wells are constructed, progressively with the development of the landfill, at 50m lateral and longitudinal centres. Additionally, vertical wells are drilled into the waste as required and determined by surveys of fugitive emissions, in order to minimise or eliminate landfill gas migration. The additional drilled wells are installed between the constructed main gas extraction wells, so as to reduce the distances between the individual wells and to increase the capture rate of landfill gas. It is ensured that the vertical gas wells are sealed at surface with bentonite as required in order to minimise the ingress of oxygen and the potential for migration of landfill gas.

Horizontal wells

In order to further enhance gas extraction and commencing in Phase 3 of the landfill (i.e. cells 9 and 10 and higher), horizontal gas wells, consisting of slotted gas extraction pipes embedded in stone filled trenches of no less than $1m^2$ sections (i.e. 1 meter depth and 1 meter width), will be installed in the surface of lifts at least 5m above the cell

bases and, in areas with a total landfill depth of more than 18m, at least 5m below the finished waste level as appropriate. Greenstar will ensure that horizontal trenches are installed as recently as possible before filling the next lift of waste above in order to minimise the potential for migration of landfill gas from the trenches. Should this not be possible, a seal of bentonite will be applied to the top of the trenches.

Landfill gas collection network

All vertical and horizontal landfill gas extraction wells will be connected to the gas collection pipe network which consists of a 355 mm ring main around the landfill footprint and 180 mm branches laid across the landfill surface. Each individual well in addition to each individual branch will, prior to the point of connection into the next higher collection level (i.e. well-branch connections and branch-ring main connections), be equipped with shut-off valves in order to enable flow restriction or isolation of individual wells or branches.

Condensate removal

In order to continuously remove condensate from the landfill gas extraction network and therefore avoid uncontrolled flow restriction and pulsating, the ring main is connected to the gas flaring and utilisation plant via condensate knockout pots. The condensate accumulating in these pots is removed by pumps and piped back into the leachate riser pipes, from where it drains to the cell base and is removed with the leachate.

Landfill gas utilisation and flaring plant

The landfill gas collected in the landfill gas extraction and collection network is, after passing through the condensate knockout pots, flared off in an enclosed flare or (in the near future) utilised in gas combustion engines with electricity generation, as appropriate.

Procedure KNKP 35 describes the monitoring and balancing of landfill gas extraction wells and collection network in order to maximise the extraction of landfill gas. Any significant downtime of landfill gas flares or other utilisation equipment is logged on Form GS 037, detailing as a minimum the date(s), time(s) and reason(s) for the downtime of the flare.

D.5.b and D.5.c Passive Venting

As each cell is constructed and filled, passive gas-venting stacks are constructed. The passive venting continues only until active venting kicks in. The early cells (cells 1-4) now have active (gas pumped to flare) gas management using both the constructed vents and installed vertical and horizontal pipework. If the passive vent stacks become blocked an alternative vertical well is drilled into the waste as described above.

D.5.d Gas Detection

‘Crowcon’ gas sensors are installed in the administration building, weighbridge hut and maintenance building. To date, no exceedance of methane concentration has occurred.

The sensors are monitored and alarmed through the site's SCADA system. A gas analyser is permanently available on site and is used for spot checks should the need arise.

D.5.e Measures to Prevent Landfill Gas Migrations

All waste has and will be placed in lined cells. The liner prevents the migration of gas into surrounding soils. There is no potential for gas migration through the surrounding soils and thus there is no need for further barriers.

D.5.f Timescale for infrastructure Installation

Gas collection pipework has been installed in cells 1-4 and will progressively be extended as each cell is developed and filled. Initially, an 'open' flare was used however an 'enclosed' flare was installed in December 2006 and is operating on a 24-hour basis. The gas-flare compound is sized to accommodate gas engines and as soon as is feasible, landfill gas will be utilised to generate electricity for export to the national grid.

D.5.j Landfill gas used to generate power

Planning permission was granted in April 2007 for installation and operation of a gas utilisation plant (planning reference NA70015). The proposed plant will be phased and will generate up to 4.2 MW of electricity for input into the national grid. There will be three landfill gas engines generating approx 1.4 MW of power each with an enclosed flare ESB substation and switch room. Greenstar is awaiting a connection from the ESB to the national grid and it is envisaged that the first gas engine will be installed and operation in 2009 pending the grid connection. Knockharley Landfill is therefore classed as disposal with energy recovery.

ATTACHMENT D.6

Capping System

ATTACHMENT D.6 CAPPING SYSTEM

D.6.a Daily Cover

Daily cover is best effected using a reasonable thickness of soil-like material. The material utilised should be permeable so that it will not create 'perched' leachate. Perched leachate does not reach the collection system and has a tendency to break-out on the cap.

Inert permeable soils are suitable for use as daily cover material. Daily cover at Knockharley comprises a minimum of 150 mm soil-like material covered with a 100 mm deep layer of wood-chip, the latter being a well documented odour abatement medium. Before being covered the waste is compacted which serves to minimise the available area for odours to escape from the daily tipping area.

Cover material is delivered on a daily basis and stockpiled on site. The soil-like material is spread by a hydraulic excavator. Where possible the material is recovered for re-use on subsequent days.

Greenstar is constantly reviewing its policy on daily cover so as to minimise any nuisance, particularly from fresh waste.

D.6.b Intermediate Cover

Condition 5.7 of the licence specifies a 300 mm layer of soil-type intermediate cover.

"intermediate capping should be 300 mm in depth unless otherwise agreed with the Agency".

There is a copious quantity of low-permeability soil available on-site for use as intermediate cover. Intermediate cover will shed water and thus minimise leachate. It will also contain landfill gas and facilitate early capture of gas for flaring or utilisation. At time of writing, Cells 1 and 2 have intermediate cover as specified in Condition 5.7 of te waste licence, and Cells 3 & 4 are partly covered.

D.6.c Intermediate capping

Intermediate capping to the standard specified in the Agency's Landfill Manuals is currently carried out at the facility. Furthermore, Greenstar proposes to progressively cap landfill cells or part thereof when filled to the required level and settled to an appropriately stable state. This will be carried out to the agreement of the Agency.

D.6.d Capping System

The licence states "*The final capping shall consist of the following:*

> *a) top soil (150 -300 mm);*
> *b) subsoils, such that total thickness of top soil and subsoils is at least 1m;*
> *c) drainage layer of 0.5m thickness having a minimum hydraulic conductivity of $1x10^{-4}$ m/s or an equivalent geosynthetic layer;*
> *d) compacted mineral layer of a minimum 0.6 m thickness with a permeability of less than $1x10^{-9}$ m/s or a geosynthetic material (e.g. GCL) or similar that provides equivalent protection; and*
> *e) gas collection layer of natural material (minimum 0.3 m) or a geosynthetic layer"*

This reflects the recommendations given in Annex 1, Clause 3.3 of the Landfill Directive. The final cap design will follow both the licence requirements and Directive recommendations.

D.6.e to D.6.i Capping System

Details of the capping system proposed will be submitted to the Agency as part of an SEW proposal