ENVIRONMENTAL RISK ASSESSMENT

G P Biotec Ltd

Anaerobic Digestion Plant
Great Porthamel

Prepared for:
G P Biotec Ltd

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1. INTRODUCTION

As part of an application for an environmental permit Operators must assess the risk to the environment and human health from the activities they seek to permit. This Environmental Risk Assessment has been undertaken in accordance with the online Environment Agency Guidance for undertaking environmental risk assessments. Environmental risks relevant to the proposed activities are:

- Emissions to Air;
- Emissions to Water;
- Emissions to Land;
- Odour;
- Noise;
- Litter;
- Pests;
- Fugitive Emissions:
- Vandalism;
- Fire; and
- Incompatible Feedstock.

For each of the above environmental criteria the approach to the assessment has followed the following four stage process:

- Identify the risks;
- Identify the receptors:
- Identify the possible pathways from the sources of the risks to the receptors:
- Assess the risks (assuming those control measures proposed are in place);
- Choose appropriate further measures to control these (if required); and
- Present the assessment.

In completing the assessment prevention and control measures proposed by G P Biotec Ltd are assumed to be in place, where relevant details of these measures are identified within the assessment.

2. Sensitive Receptors

Human Receptors

Primarily for airborne emissions, specific receptors have been identified where people are likely to be regularly exposed for prolonged periods of time (e.g., residential areas or places of work). The location of the discrete sensitive receptors within 1km of the site is presented in Table 1.1 below.

Table 1.1: Sensitive Human Receptor Locations		
Receptor	Distance (m)	Direction
Great Porthamel Farm	50	NW
Lower Porthamal	640	NE
Porthamal Cottages	707	NE
Talgarth School	770	SW
Hay Road properties	880	SW
Park Avenue properties	792	SW
Bryn Derwen properties	688	SW
Kings Drive properties	917	SW
Woodlands Avenue properties	818	SW

Habitat Sites

The Environment Agency's 'Risk assessments for specific activities: environmental permits' guidance and 'Air emissions risk assessment for your environmental permit' guidance (which Natural Resources Wales H1 guidance links to) state that the impact of emissions to air on vegetation and ecosystems should be assessed for the following habitat sites within 10 km of the source:

- Special Areas of Conservation (SACs) and candidate SACs (cSACs) designated under the EC Habitats Directive[1];
- Special Protection Areas (SPAs) and potential SPAs designated under the EC Birds Directive[2]; and
- Ramsar Sites designated under the Convention on Wetlands of International Importance[3].

Within 2km of the source:

- Sites of Special Scientific Interest (SSSI) established by the 1981 Wildlife and Countryside Act;
- National Nature Reserves (NNR);
- Local Nature Reserves (LNR);
- Local wildlife sites (Sites of Interest for Nature Conservation (SINC) and Sites of Local Interest for Nature Conservation (SLINC)); and
- Ancient woodland.

Habitat receptor designations and locations relevant to the assessment are presented in Table 1.2.

1 Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora.

2 Council Directive 79/409/EEC on the conservation of wild birds

3 Ramsar (1971), The Convention of Wetlands of International Importance especially as Waterfowl Habitat.

Table 1.2: Sensitive Habitat Receptors		
Receptor	Primary Sensitive Habitat	Approx. Location (Relative to Centre of Site)
Unnamed Wood	Ancient Semi Natural woodland	149 m SW
Unnamed Wood	Ancient Semi Natural woodland	334 m W
Unnamed Wood	Ancient Semi Natural woodland	427 m E
Unnamed Wood	Ancient Semi Natural woodland	428 m W
Unnamed Wood	Ancient Semi Natural woodland	434 m E
Unnamed Wood	Plantation on Ancient woodland Site	455 m E
Unnamed Wood	Plantation on Ancient woodland Site	472 m E
Unnamed Wood	Ancient Semi Natural woodland	514 m E
Afon Llynfi	SSSI	514 m NW
Unnamed Wood	Restored Ancient woodland	533 m E
Unnamed Wood	Ancient Semi Natural woodland	583 m E
Unnamed Wood	Plantation on Ancient woodland Site	593 m E
Unnamed Wood	Plantation on Ancient woodland Site	605 m E
Afon Gwy	SAC	612 m NW
Unnamed Wood	Ancient Semi Natural woodland	613 m E
Unnamed Wood	Restored Ancient woodland	669 m E
Unnamed Wood	Ancient woodland	683 m E
Unnamed Wood	Plantation on Ancient woodland Site	691 m SE
Unnamed Wood	Ancient Semi Natural woodland	765 m NW
Unnamed Wood	Ancient Semi Natural woodland	865 m W
Unnamed Wood	Ancient Semi Natural woodland	885 m SE
Unnamed Wood	Ancient woodland	926 m E
Unnamed Wood	Restored Ancient woodland	1018 m E
Unnamed Wood	Ancient Semi Natural woodland	1031 m SE
Unnamed Wood	Restored Ancient woodland	1072 m SE
Unnamed Wood	Plantation on Ancient woodland Site	1116 m E
Unnamed Wood	Plantation on Ancient woodland Site	1197 m SE
Unnamed Wood	Plantation on Ancient woodland Site	1200 m SE
Unnamed Wood	Ancient Semi Natural woodland	1208 m E
Unnamed Wood	Restored Ancient woodland	1233 m SE
Unnamed Wood	Restored Ancient woodland	1241 m E
Unnamed Wood	Restored Ancient woodland	1260 m SE
Unnamed Wood	Ancient Semi Natural woodland	1292 m SE
Unnamed Wood	Restored Ancient woodland	1299 m SE
Unnamed Wood	Ancient Semi Natural woodland	1320 m SE
Unnamed Wood	Plantation on Ancient woodland Site	1342 m E
Unnamed Wood	Restored Ancient woodland	1345 m SE
Unnamed Wood	Ancient Semi Natural woodland	1348 m SE
Unnamed Wood	Ancient Semi Natural woodland	1376 m SE

Unnamed Wood	Ancient Semi Natural woodland	1386 m S
Unnamed Wood	Ancient Semi Natural woodland	1450m NW
Unnamed Wood	Plantation on Ancient woodland Site	1599 m SE
Unnamed Wood	Ancient Semi Natural woodland	1639 m SE
Unnamed Wood	Ancient Semi Natural woodland	1644 m NW
Unnamed Wood	Ancient Semi Natural woodland	1650 m NW
Unnamed Wood	Plantation on Ancient woodland Site	1669 m SE
Unnamed Wood	Ancient Semi Natural woodland	1742 m S
Unnamed Wood	Ancient Semi Natural woodland	1754 m N
Unnamed Wood	Ancient Semi Natural woodland	1809 m NW
Unnamed Wood	Restored Ancient woodland	1815 m E
Unnamed Wood	Plantation on Ancient woodland Site	1827 m SE
Unnamed Wood	Restored Ancient woodland	1905 m NE
Unnamed Wood	Restored Ancient woodland	1918 m S
Unnamed Wood	Plantation on Ancient woodland Site	1947 m E
Unnamed Wood	Restored Ancient woodland	1952 m W
Unnamed Wood	Ancient Semi Natural woodland	1959 m E
Unnamed Wood	Ancient Semi Natural woodland	1966 m SE
Pyll-y-Wrach	SSSI	2000 m S
Drostre Bank	SAC	7292 m SW
Llangorse Lake	SAC	8430 m SW

Table 1.3 Environmental Risk Assessment						
Hazard	Receptor	Pathway	Risk Management Techniques	Probability of Exposure	Consequence	Overall Risk (following Mitigation)
Point Source \ Releases to Air	Atmosphere	Airborne	• The facility combusts cleaned and conditioned biogas only. • The facility has several existing point source emissions: from the CHP units (A1) and (A2) , emergency flare (A3), liquid waste tank carbon filter outlet (A6). This permit variation will add two new point sources: standby biogas boiler (A7) and biomethane upgrading plant stack (A8). • Activated carbon which has an extremely high efficiency will be used to filter the raw biogas to remove contaminants prior to biomethane upgrading. • The new standby biogas boiler will only be operated to supplement heat to the digestion process when one of the main CHPs is off. • The site is not located within an AQMA. • All emission concentrations from the plant will be in line with those ELV's specified in the permit. • Analysis of the raw biogas (prior to activated carbon filtration and biogas upgrading) has not indicated the presence of ammonia.	Low: offsite receptor impacts	Air Pollution	**VERY LOW** due to the proposed processes on site
Emissions to Water	Groundwater / Geology / Surface Water	Waterborne	• There are no process emissions to controlled waters. • All surface water collected from the ABP waste reception areas (existing anaerobic digestion part of site) is currently collected and transferred into the digesters. All uncontaminated surface water that collects in the bunded area (digesters)	Low: all runoff is controlled on site, therefore the probability of exposure is low.	Contamination	**VERY LOW** due to the proposed management techniques and drainage arrangements

			is tested and where suitable, released at point W1 on the Permit Site Plan to where the surface water enters the River Llynfi. • Any SW not suitable for release at W1 is collected and returned to the digestion process. • The new biomethane upgrading plant and standby biogas boiler will not add any liquid process emissions other than condensate which will be routed back to the digestion process. • Clean surface water from the biomethane upgrading plant area will drain to land (but as the process is enclosed this will not be able to be contaminated). • A sealed drainage and containment system for all tanks containing potentially polluting liquids has been constructed so that any leaks / spills are contained • Tanks are inspected visually on a daily basis by site staff to ensure continued integrity of tanks, and identify any necessary remedial action; • Spill kits are strategically located around site. • Minor spills are cleaned up immediately, using spill kits. Resultant materials to be placed in container for off-site disposal to appropriate facility, if necessary. • Immediate action to be taken in event of any major spills. Spillage to be cleared immediately and placed in containers for offsite disposal. NRW to be informed			
Emissions to Land	Groundwater / Geology	Spills / Leaks	• There are no emissions to land arising from the facility.	Low: spills / leaks could potentially contaminate the	Contamination	LOW due to the proposed risk

			• All tanks associated with the new biomethane upgrading process have been constructed in line with the relevant standards. • All storage of solid feedstock is upon hardstanding in appropriately constructed containment (clamps). • Storage of liquid digestate and blackwater is in a lagoon. • Clean surface water from the biomethane upgrading plant area will drain to land (but as the process is enclosed this will not be able to be contaminated). • Spill kits will be strategically located around site. • Minor spills to be cleaned up immediately, using spill kits. Resultant materials to be placed in container for off-site disposal to appropriate facility, if necessary. • Immediate action to be taken in event of any major spills. Spillage to be cleared immediately and placed in containers for offsite disposal. EA to be informed	ground / groundwater underneath the site.		management techniques
Noise	Local Residents	Airborne	• All potentially noisy plant will be acoustically enclosed and / or fitted with attenuation where necessary. • Vehicle deliveries will only take place during daytime; • Appropriate preventative maintenance will be provided for the various elements of the installation. This will ensure no deterioration of plant or equipment that would give rise to increases in noise. • The processing plant and associated equipment has been designed in accordance with best	Low: due to the nature of the activities	Nuisance	LOW due to the proposed risk management techniques

			practice and to ensure that internal noise does not present an issue to the employees at the site under the Control of Noise at Work Regulations and to ensure that noise breakout does not lead to noise nuisance at the identified sensitive receptors. • The facility will not give rise to reasonable cause for annoyance. In the unlikely event that complaints are received measures described in the integrated management system will be put in place. • A Noise Assessment has been undertaken as part of this permit variation (see SOL_21_P001_GPB Annex D – Noise Assessment)			
Odour	Local Residents	Airborne	• The site is managed in accordance with an Odour Management Plan. • Daily odour monitoring is carried out as part of daily checks. • Under normal circumstances the main permitted process (anaerobic digestion) takes place in an oxygen depleted environment and is an enclosed system, thereby minimising potential for odour release. • Silage is stored in sealed sheeting and minimum surface area is exposed during delivery and digester loading. • Liquid slurry is delivered in sealed tankers and pumped straight into the sites sealed system for input to the digester. • Spillages during waste delivery or digestate export are immediately cleared by trained site staff and the area appropriately washed down.	Medium: the occurrence of odour emissions from the site is possible	Nuisance	LOW due to the proposed risk management techniques

			• Odorant for the biomethane will be stored in a suitable container with bunding, within the GEU kiosk. • The addition of the new biomethane upgrading plant and new standby boiler are not anticipated to result in odour emissions.			
Litter	Local Residents	Airborne	• All incoming and exporting waste vehicles are covered. • The site access and site services shall be swept as necessary. • The site is inspected daily by the site manager and any litter or accumulated debris is dealt with immediately.	Low: the occurrence of litter on site is highly unlikely therefore the probability of exposure is very low.	Nuisance	VERY LOW due to the proposed risk management techniques
Pests	Local Residents	Airborne & migration	• The new biomethane upgrading plant and standby biogas boiler will not accept wastes directly and will rely solely on biogas feed generated from the existing anaerobic digestion plant. • If a problem does develop, reasonable measures will be taken to use commercially available products and appropriately qualified services to control pests. • If a particular waste is determined to be the cause of a problem (i.e., in the main anaerobic digestion area) it shall be removed from site at the earliest available opportunity and consideration given to mitigation measures that may be implemented before any more waste from that source is accepted on site.	Low: the occurrence of pests on site is unlikely.	Nuisance	VERY LOW due to the proposed risk management techniques
Vandalism	Operator	The site could be subject to intentional	• The site has a CCTV monitoring system. • External online monitoring of the process from a remote location • The site is secured by a perimeter fence.	Low: the occurrence of vandalism taking	Nuisance, Damage or Fire	VERY LOW due to the proposed risk

		vandalism and damage by intruders / trespassers who could cause damage or harm to the site or cause fires.	• Fencing is maintained and repaired to ensure its continued integrity. If damage is sustained, repair will be made within the same working day. If this is not possible, suitable measures will be taken to prevent unauthorised access to the site and permanent repairs will be affected as soon as is practicable. • All visitors to the site are required to register in the visitor's book and sign out again on exit, thereby minimising the risk of unauthorised visitors on the site.	place on site is highly unlikely.		management techniques
Fire / explosion on site.	Operator / Residential Properties	Windborne	• Arson by intruders is controlled via CCTV monitoring. • The site is secured by a perimeter fence. • The site has a regular inspection and maintenance programme which identifies any electrical or mechanical machinery faults which could result in a machinery fire. • The existing anaerobic digestion process is inherently a 'wet' process and undertaken within enclosed systems minimising risk. • The new biomethane to grid plant has been subject to DSEAR Assessment and utilises ATEX rated equipment • The new propane storage tanks for the biomethane upgrading plant are supplied and managed by specialist contractor and meet relevant HSE requirements. • Machinery is regularly cleaned to remove any dust, etc; • All relevant equipment on site is equipped with dedicated fire suppression.	Medium: the occurrence of a fire taking place on site is possible due to the gaseous nature of certain materials	Fire / explosion	LOW due to the proposed risk management techniques

			• A number of fire extinguishers are placed at strategic locations around the plant. • The potential for sparks is regularly monitored by site staff. • The risk of damaged or exposed electrical cables is controlled via the regular inspection and maintenance programme. • Staff and visitors are only permitted to smoke within the designated smoking area. • There is no smoking permitted within the operational area of the site.			
Incompatible Feedstock	Operator / Residential Properties	If incorrect waste is accepted on site it could result in adverse emissions	The following methods are implemented to ensure that incompatible feedstocks do not compromise the safe operation of the anaerobic digestion plant: • All waste accepted onto site have been subject to 'pre-acceptance' in accordance to established procedures; • All incoming wastes are accepted in accordance with established procedures; • Any non-conforming wastes will be removed prior to acceptance in accordance with established procedures. Records of incidents involving incompatible wastes are kept on site together with a summary of the remedial action taken. The new plant to be added as part of this permit variation: biomethane to grid and standby biogas boiler will both rely on biogas input generated from the onsite anaerobic digestion and will not accept waste directly.	Low: offsite receptor impacts	Nuisance / Adverse Emissions	VERY LOW due to the proposed risk management techniques