



**Cyfoeth  
Naturiol**  
Cymru  
**Natural  
Resources**  
Wales

## **Permit with introductory note**

The Environmental Permitting (England & Wales) Regulations 2010

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Carmarthenshire County Council.

Nantycaws Landfill Phase 1  
Llanddarog Road  
Nantycaws  
Carmarthen  
SA32 8BG

Permit number  
EPR/TP3298FH

# Nantycaws Landfill Phase 1

## Permit number EPR/TP3298FH

### Introductory note

#### **This introductory note does not form a part of the permit**

The main features of the permit are as follows.

This is a Tier 3 bespoke permit for a closed household, commercial and industrial waste landfill. The site has stopped accepting waste for disposal, and the permit does not allow waste acceptance for this purpose. However, the site is not yet in 'definitive closure'.

Waste may be accepted for restoration of the site, as set out in the approved closure and aftercare plan incorporated in Table S1.2 and in line with the relevant conditions, set out in this permit.

The status log of the permit sets out the permitting history, including any changes to the permit reference number.

Status log of the permit		
Description	Date	Comments
Resolution	12/12/85	
Resolution converted to a Waste Management Licence (reference EAWML 34138)	01/05/94	Regulatory change by virtue of Section 77(2) of the Environmental Protection Act 1990
Modification determined	21/12/01	All previous conditions deleted and replaced with new conditions.
Varied and consolidated permit determined EPR/TP3298FH (formerly EAWML 34138)	27/05/15	Natural Resources Wales initiated variation to include the approved closure report and aftercare plan issued. The permit has been updated and consolidated into modern standards used under the Environmental Permitting Regulations.

End of introductory note

# Permit

The Environmental Permitting (England and Wales) Regulations 2010

**Permit number**

**EPR/TP3298FH**

The Natural Resources Body for Wales (“Natural Resources Wales”) authorises, under regulation 13 of the Environmental Permitting (England and Wales) Regulations 2010

**Carmarthenshire County Council** (“the operator”),

of

**Council Offices**

**3 Spillman Street**

**Carmarthen**

**SA31 1LE**

to operate waste operations at

**Nantycaws Landfill Phase 1**

**Llanddarog Road**

**Nantycaws**

**Carmarthen**

**SA32 8BG**

to the extent authorised by and subject to the conditions of this permit.

Name	Date
<b>Holly Noble</b>	<b>27/05/2015</b>

Authorised on behalf of Natural Resources Wales

# Conditions

## 1 Management

### 1.1 General management

- 1.1.1 The operator shall manage and operate the activities:
- (a) in accordance with a written management system that identifies and minimises risks of pollution, including those arising from operations, maintenance, accidents, incidents, non-conformances, closure and those drawn to the attention of the operator as a result of complaints; and
  - (b) using sufficient competent persons and resources.
- 1.1.2 Records demonstrating compliance with condition 1.1.1 shall be maintained.
- 1.1.3 Any person having duties that are or may be affected by the matters set out in this permit shall have convenient access to a copy of it kept at or near the place where those duties are carried out.
- 1.1.4 The operator shall comply with the requirements of an approved competence scheme.

### 1.2 Energy efficiency

- 1.2.1 The operator shall:
- (a) Review and record at least every four years whether there are suitable opportunities to improve the energy efficiency of the activities; and
  - (b) Implement any appropriate measures identified by a review.

### 1.3 Avoidance, recovery and disposal of wastes produced by the activities

- 1.3.1 The operator shall take appropriate measures to ensure that:
- (a) the waste hierarchy referred to in Article 4 of the Waste Framework Directive is applied to the generation of waste by the activities; and
  - (b) any waste generated by the activities is treated in accordance with the waste hierarchy referred to in Article 4 of the Waste Framework Directive; and
  - (c) where disposal is necessary, this is undertaken in a manner which minimises its impact on the environment.
- 1.3.2 The operator shall review and record at least every four years whether changes to those measures should be made and take any further appropriate measures identified by a review.

## 2 Operations

### 2.1 Permitted activities

- 2.1.1 The operator is only authorised to carry out the activities specified in schedule 1 table S1.1 (the “activities”).

## **2.2 The site**

- 2.2.1 The activities shall not extend beyond the site, being the land shown edged in green on the site plan at schedule 7 to this permit.

## **2.3 Operating techniques**

- 2.3.1 (a) The activities shall, subject to the conditions of this permit, be operated using the techniques and in the manner described in the documentation specified in schedule 1, table S1.2, unless otherwise agreed in writing by Natural Resources Wales.
- (b) If notified by Natural Resources Wales that the activities are giving rise to pollution, the operator shall submit to Natural Resources Wales for approval within the period specified, a revision of any plan or other documentation ("plan") specified in schedule 1, table S1.2 or otherwise required under this permit which identifies and minimises the risks of pollution relevant to that plan, and shall implement the approved revised plan in place of the original from the date of approval, unless otherwise agreed in writing by Natural Resources Wales.

## **2.4 Improvement programme**

- 2.4.1 The operator shall complete the improvements specified in schedule 1 table S1.3 by the date specified in that table unless otherwise agreed in writing by Natural Resources Wales.
- 2.4.2 Except in the case of an improvement which consists only of a submission to Natural Resources Wales, the operator shall notify Natural Resources Wales within 14 days of completion of each improvement.

## **2.5 Landfill Engineering**

- 2.5.1 No construction of landfill infrastructure shall commence until the operator has submitted relevant construction proposals or a written request to use previous construction proposals and Natural Resources Wales has confirmed that it is satisfied with the construction proposals.
- 2.5.2 The construction of the landfill infrastructure shall take place only in accordance with the approved construction proposals unless:
- (a) any change to the approved construction proposals would have no impact on the performance of any element of the design; or
- (b) a change has otherwise been agreed in writing by Natural Resources Wales.
- 2.5.3 The operator shall submit a CQA Validation Report as soon as practicable following the construction of the relevant landfill infrastructure.
- 2.5.4 Where pollution controls are immediately necessary to prevent an incident or accident, then conditions 2.5.1 and 2.5.2 do not apply and the relevant landfill infrastructure may be constructed, provided that the construction proposals are submitted to Natural Resources Wales as soon as practicable.
- 2.5.5 For the purpose of condition 2.5.1, Natural Resources Wales shall be deemed to be satisfied where it has not, within the period of four weeks from the date of receipt of the relevant construction proposals or CQA Validation Report, either:
- (a) confirmed whether or not it is satisfied; or

- (b) informed the operator that it requires further information.
- 2.5.6 Where Natural Resources Wales has required further information under condition 2.5.5(b), Natural Resources Wales shall be deemed to be satisfied where it has not, within the period of four weeks from the date of receipt of the further information, either:
  - (a) confirmed whether or not it is satisfied; or
  - (b) informed the operator that it requires further information.

## **2.6 Waste acceptance**

- 2.6.1 No waste shall be accepted for disposal within the facility
- 2.6.2 Wastes shall only be accepted for recovery if:
  - (a) they are listed in schedule 2,
  - (b) they are not liquid waste (including waste waters but excluding sludge).
- 2.6.3 The operator shall visually inspect:
  - (a) without unloading it, waste that is not in an enclosed container or enclosed vehicle on arrival at the landfill; and
  - (b) waste at the point of deposit;

and shall satisfy itself that it conforms to the basic characterisation documentation submitted by the holder.
- 2.6.4 The operator on accepting each delivery of waste shall provide a receipt to the person delivering it.
- 2.6.5 The total quantity of waste that shall be deposited in the landfill shall be limited by the final restoration contours as determined by the approved improvement condition submission in relation to IPC1 of table S1.3.
- 2.6.6 The quantity of waste that is deposited in the landfill in any year shall not exceed the limits in schedule 1 table S1.4.
- 2.6.7 The operator shall maintain and implement a system which ensures that a record is made of the quantity, characteristics, date of delivery and, where practicable, origin of any waste that is received for recovery and of the identity of the producer. Any information regarded by the operator as commercially confidential shall be clearly identified in the record.

## **2.7 Leachate levels**

- 2.7.1 The limits for the level of leachate listed in schedule 3 table S3.1 shall not be exceeded.

## **2.8 Closure and aftercare**

- 2.8.1 The operator shall maintain a closure and aftercare management plan.

## **2.9 Landfill Gas Management**

- 2.9.1 The operator shall take appropriate measures, including, but not limited to, those specified in any approved landfill gas management plan, to:
  - (a) collect landfill gas; and
  - (b) control the migration of landfill gas.

- 2.9.2 The operator shall use the collected landfill gas to produce energy. If the collected landfill gas cannot be used to produce energy, the operator shall flare or otherwise treat the gas.
- 2.9.3 The operator shall:
- (a) if notified by the Environment Agency, submit to the Environment Agency for approval within the period specified, a revised landfill gas management plan;
  - (b) implement the revised landfill gas management plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency.

## **3 Emissions and monitoring**

### **3.1 Emissions to water, air or land**

- 3.1.1 There shall be no point source emissions to water, air or land except from the sources and emission points listed in schedule 3, tables: S3.2; S3.3; S3.4 and S3.5.
- 3.1.2 The trigger levels for emissions into groundwater for the parameter(s) and monitoring point(s) set out in schedule 3 table S3.3 shall not be exceeded.
- 3.1.3 Where a substance is specified in schedule 3 table S3.3 or S3.4 but no limit is set for it, the concentration of such substance in emissions to water from the relevant emission points shall be no greater than the background concentration. 3.1.4 There shall be no emission from the activities into groundwater of any non-hazardous pollutants so as to cause pollution.
- 3.1.5 The operator shall submit to Natural Resources Wales a review of the Hydrogeological Risk Assessment between nine and six months prior to every subsequent six years after the sixth anniversary of the granting of the permit.
- 3.1.6 The limits for landfill gas arising from the installation/facility set out in schedule 3, tables S3.4 and S3.5 shall not be exceeded.

### **3.2 Emissions of substances not controlled by emission limits**

- 3.2.1 Emissions of substances not controlled by emission limits (excluding odour) shall not cause pollution. The operator shall not be taken to have breached this condition if appropriate measures, including, but not limited to, those specified in any approved emissions management plan, have been taken to prevent or where that is not practicable, to minimise, those emissions.
- 3.2.2 The operator shall:
- (a) if notified by Natural Resources Wales that the activities are giving rise to pollution, submit to Natural Resources Wales for approval within the period specified, an emissions management plan which identifies and minimises the risks of pollution from emissions of substances not controlled by emission limits;
  - (b) implement the approved emissions management plan, from the date of approval, unless otherwise agreed in writing by Natural Resources Wales.

### **3.3 Odour**

- 3.3.1 Emissions from the activities shall be free from odour at levels likely to cause pollution outside the site, as perceived by an authorised officer of Natural Resources Wales, unless the operator has used appropriate measures, including, but not limited to, those specified in any approved odour management plan, to prevent or where that is not practicable to minimise the odour.
- 3.3.2 The operator shall:
- (a) if notified by Natural Resources Wales that the activities are giving rise to pollution outside the site due to odour, submit to Natural Resources Wales for approval within the period specified, an odour management plan which identifies and minimises the risks of pollution from odour;
  - (b) implement the approved odour management plan, from the date of approval, unless otherwise agreed in writing by Natural Resources Wales.

### **3.4 Noise and vibration**

- 3.4.1 Emissions from the activities shall be free from noise and vibration at levels likely to cause pollution outside the site, as perceived by an authorised officer of Natural Resources Wales, unless the operator has used appropriate measures, including, but not limited to, those specified in any approved noise and vibration management plan to prevent or where that is not practicable to minimise the noise and vibration.
- 3.4.2 The operator shall:
- (a) if notified by Natural Resources Wales that the activities are giving rise to pollution outside the site due to noise and vibration, submit to Natural Resources Wales for approval within the period specified, a noise and vibration management plan which identifies and minimises the risks of pollution from noise and vibration;
  - (b) implement the approved noise and vibration management plan, from the date of approval, unless otherwise agreed in writing by Natural Resources Wales.

### **3.5 Monitoring**

- 3.5.1 The operator shall, unless otherwise agreed in writing by Natural Resources Wales, undertake the monitoring and any other actions specified in the following tables in schedule 3 to this permit:
- (a) Leachate specified in tables S3.1 and S3.7;
  - (b) Groundwater specified in tables S3.3 and S3.9;
  - (c) Landfill gas specified in tables S3.4, S3.5 and S3.6;
  - (d) Surface water specified in table S3.2 and S3.8.
- 3.5.2 The operator shall maintain records of all monitoring required by this permit including records of the taking and analysis of samples, instrument measurements (periodic and continual), calibrations, examinations, tests and surveys and any assessment or evaluation made on the basis of such data.
- 3.5.3 A topographical survey of the site referenced to ordnance datum shall be carried out:
- (a) every five years
- The topographical survey shall be used to produce a plan of a scale adequate to show the surveyed features of the site.



- 3.5.4 Monitoring equipment, techniques, personnel and organisations employed for the emissions monitoring programme and the environmental or other monitoring specified in condition 3.5.1 shall have either MCERTS certification or MCERTS accreditation (as appropriate), where available, unless otherwise agreed in writing by Natural Resources Wales.
- 3.5.5 Permanent means of access shall be provided to enable sampling/monitoring to be carried out in relation to the emission points specified in schedule 3, unless otherwise agreed in writing by Natural Resources Wales.

## **4 Information**

### **4.1 Records**

- 4.1.1 All records required to be made by this permit shall:
- (a) be legible;
  - (b) be made as soon as reasonably practicable;
  - (c) if amended, be amended in such a way that the original and any subsequent amendments remain legible, or are capable of retrieval; and
  - (d) be retained, unless otherwise agreed in writing by Natural Resources Wales, for at least 6 years from the date when the records were made, or in the case of the following records until permit surrender:
    - (i) off-site environmental effects; and
    - (ii) matters which affect the condition of the land and groundwater.
    - (iii) the results of groundwater monitoring;
    - (iv) sub-surface landfill gas monitoring;
    - (v) leachate levels, quality and quantities;
    - (vi) landfill gas generation and collection;
    - (vii) waste types and quantities;
    - (viii) the location of hazardous waste deposits; and
    - (ix) the specification and as built drawings of the basal, sidewall and capping engineering systems.
- 4.1.2 The operator shall keep on site all records, plans and the management system required to be maintained by this permit, unless otherwise agreed in writing by Natural Resources Wales.

### **4.2 Reporting**

- 4.2.1 The operator shall send all reports and notifications required by the permit to Natural Resources Wales using the contact details supplied in writing by Natural Resources Wales.
- 4.2.2 A report or reports on the performance of the activities over the previous year shall be submitted to Natural Resources Wales by 31 January (or other date agreed in writing by Natural Resources Wales) each year. The report(s) shall include as a minimum:

- (a) a review of the results of the monitoring and assessment carried out in accordance with this permit against the relevant assumptions, parameters and results in the risk assessments submitted in relation to this facility and any agreed amendments thereto;
  - (b) the annual production/treatment set out in schedule 4 table S4.2;
  - (c) the topographical surveys required by condition 3.5.3 other than those submitted as part of a CQA validation report;
  - (d) an assessment of the settlement behaviour of the landfill body based on the difference between the most recent topographical survey and previous annual topographical survey for the areas of the landfill which did not receive waste between the surveys;
- 4.2.3 Within 28 days of the end of the reporting period the operator shall, unless otherwise agreed in writing by Natural Resources Wales, submit reports of the monitoring and assessment carried out in accordance with the conditions of this permit, as follows:
- (a) in respect of the parameters and emission points specified in schedule 4 table S4.1;
  - (b) for the reporting periods specified in schedule 4 table S4.1 and using the forms specified in schedule 4 table S4.4; and
  - (c) giving the information from such results and assessments as may be required by the forms specified in those tables.
- 4.2.4 Within one month of the end of each quarter, the operator shall submit to the Environment Agency using the form made available for the purpose, the information specified on the form relating to the site and the waste accepted and removed from it during the previous quarter.
- 4.2.5 The operator shall, unless notice under this condition has been served within the preceding four years, submit to Natural Resources Wales, within six months of receipt of a written notice, a report assessing whether there are other appropriate measures that could be taken to prevent, or where that is not practicable, to minimise pollution.

## 4.3 Notifications

- 4.3.1 (a) In the event that the operation of the activities gives rise to an incident or accident which significantly affects or may significantly affect the environment, the operator must immediately—
- (i) inform Natural Resources Wales,
  - (ii) take the measures necessary to limit the environmental consequences of such an incident or accident, and
  - (iii) take the measures necessary to prevent further possible incidents or accidents;
- (b) in the event of a breach of any permit condition the operator must immediately—
- (i) inform Natural Resources Wales, and
  - (ii) take the measures necessary to ensure that compliance is restored within the shortest possible time;
- (c) in the event of a breach of permit condition which poses an immediate danger to human health or threatens to cause an immediate significant adverse effect on the environment, the operator must immediately suspend the operation of the

activities or the relevant part of it until compliance with the permit conditions has been restored.

- 4.3.2 Any information provided under condition 4.3.1(a)(i), or 4.3.1 (b)(i) where the information relates to the breach of a limit specified in the permit, shall be confirmed by sending the information listed in schedule 5 to this permit within the time period specified in that schedule.
- 4.3.3 Natural Resources Wales shall be notified within 14 days of the occurrence of the following matters, except where such disclosure is prohibited by Stock Exchange rules:

Where the operator is a registered company:

- (a) any change in the operator's trading name, registered name or registered office address; and
- (b) any steps taken with a view to the operator going into administration, entering into a company voluntary arrangement or being wound up.

Where the operator is a corporate body other than a registered company:

- (a) any change in the operator's name or address; and
- (b) any steps taken with a view to the dissolution of the operator.

In any other case:

- (a) the death of any of the named operators (where the operator consists of more than one named individual);
- (b) any change in the operator's name(s) or address(es); and
- (c) any steps taken with a view to the operator, or any one of them, going into bankruptcy, entering into a composition or arrangement with creditors, or, in the case of them being in a partnership, dissolving the partnership.

- 4.3.5 Where the operator proposes to make a change in the nature or functioning, or an extension of the activities, which may have consequences for the environment and the change is not otherwise the subject of an application for approval under the Regulations or this permit:

- (a) Natural Resources Wales shall be notified at least 14 days before making the change; and
- (b) the notification shall contain a description of the proposed change in operation.

## **4.4 Interpretation**

- 4.4.1 In this permit the expressions listed in schedule 6 shall have the meaning given in that schedule.
- 4.4.2 In this permit references to reports and notifications mean written reports and notifications, except where reference is made to notification being made "without delay", in which case it may be provided by telephone.

# Schedule 1 - Operations

Table S1.1 activities		
Activity reference	Description of specified activity and Waste Framework Directive Annex I and II operations	Limits of activities
<b>Closed Household Commercial and Industrial waste landfill</b>	<b>D1:</b> Deposit into or onto land (e.g. landfill)	No waste shall be accepted for disposal at the site.
	<b>R3:</b> Recycling/reclamation of organic substances which are not used as solvents (including composting and other biological transformation processes)	Recovery of waste for maintenance of the restoration layer above the landfill cap.
	<b>R5:</b> Recycling/reclamation of other inorganic materials	Waste types as specified in Table S 2.1 – in line with improvement conditions IPC1, 2 and 7 - only.
	Integral discharge of surface water drainage from the landfilled area	Site drainage arising from the landfill and discharged via "Runoff discharge point" and "French drain" into the Afon Bantwen.
		<p>Leachate management: There shall be no treatment or re-circulation of leachate at the facility.</p> <p>Leachate arising from the landfill must be exported off-site to an appropriate facility for treatment.</p> <p>Landfill gas: There shall be no treatment of landfill gas at the site.</p> <p>Landfill gas arising from the closed landfill shall be sent to the Nantycaws Phase 2 Landfill, gas flaring facility (EPR/ CP3735PB) or gas utilisation facility (EPR/LP3038SU).</p>

Table S1.2 Operating techniques		
Description	Parts	Date Received
Geotechnology report: "Aftercare Management Plan" dated January 2015 (reference: 1294r1v3d0115).	All	12/01/15

Table S1.3 Improvement programme requirements		
Reference	Requirement	Date
IPC1	Undertake survey of areas used to historically store materials. Objective of assessment should be to identify and assess potential damage to the cap. Use the results to determine practicable remedial measures required to remediate (where necessary) the capping systems and restoration layer.	14/01/16
IPC2	Investigate soft ground on southern flank west of drain placed to capture previous leachate breakout (Photo N on Figure 13 in WP2), fully saturated waste in southern part of site (see area identified in Figure 13 in WP2) and northwestern flank where ground is soft all year (Photo C on Figure 13 in WP2).	14/01/16

<b>Table S1.3 Improvement programme requirements</b>		
<b>Reference</b>	<b>Requirement</b>	<b>Date</b>
IPC3	Improve accessibility at BH106 as piezometer tubing is below ground level.	14/07/15
IPC4	Repair headworks at BH109 to enable gas tap to be removed and groundwater level measured	14/07/15
IPC5	Excavate BH110 and install new headworks to enable monitoring.	14/07/15
IPC6	Investigate cause of poor drainage/different grass species on eastern flank (see area identified on Figure 13 in WP2). If necessary, develop remedial plan.	14/01/16
IPC7	Replace soil around leachate inspection chambers or lower infrastructure in areas where the waste has settled to minimize visual impact.	14/01/16
IPC8	Replace sampling valves on all gas extraction wells to enable monitoring at the well head.	14/07/15
IPC9	Clear vegetation and improve access to gas extraction manifolds.	14/04/14
IPC10	Identify gas extraction wells that are leaking and not fit for purpose. A plan should be developed to seal wells and or replace wells no longer suitable for use.	14/07/15
IPC11	Assess the need for new gas extraction wells as current number of wells is insufficient. Evaluate the potential for increased gas extraction.	14/07/15
IPC12	Ensure that all gas extraction wells are clearly identified and that the labelling system used agrees with the plan of the gas extraction network.	14/07/15
IPC13	As part of the 2014 Annual Monitoring Report (due January 2015), the operator will assess leachate level results against the leachate flow rates and rainfall records. This will be used to assess the effectiveness of the leachate drainage system.	14/01/16

<b>Table S1.4 Annual waste input limits</b>	
<b>Category</b>	<b>Limit Tonnes/ Year</b>
Inert waste for engineering including maintenance of restoration layer above the cap, as set out in Table S2.1.	Limits to be agreed as part of improvement conditions IPC1, 2 and 7 (where appropriate).

## Schedule 2 - List of permitted wastes

**Table S2.1 Permitted waste types accepted for restoration**

<b>Waste code <sup>1</sup></b>	<b>Description<sup>1</sup></b>
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To be agreed	To be agreed
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<sup>1</sup> List of wastes (and description) to be accepted on site for maintenance of restoration layer shall be specified in improvement conditions IPC 1, 2 and 7 submissions (and approved by Natural Resources Wales in writing).

## Schedule 3 – Emissions and monitoring

**Table S3.1 Leachate level limits and monitoring requirements**

Monitoring point reference/ Description	Limit	Monitoring frequency	Monitoring method	Other requirements
In-Waste Leachate Inspection Chambers LC 1 to 22 as shown on Figure 11 of the Aftercare Management Plan.	0.5m above base of the chamber	Monthly for 12 months reverting to quarterly thereafter, unless otherwise agreed in writing with Natural Resources Wales	Unless otherwise agreed in writing with Natural Resources Wales, monitoring methods used shall be in accordance with Environment Agency document "Guidance on monitoring of landfill leachate, groundwater and surface water" (LFTGN 02).	

**Table S3.2 Point source emissions to water (other than sewer) – emission limits and monitoring requirements**

Emission point Reference and Location	Parameter	Source	Limit	Reference Period	Monitoring Frequency	Monitoring Standard or Method
“French Drain” as shown on Figure 8 of the Aftercare Management Plan.	Ammoniacal Nitrogen	French Drain	4 (mg/l)	Spot Sample	Daily (when flowing).	In accordance with Environment Agency document ‘Guidance on monitoring of landfill leachate, groundwater and surface water’ (LFTGN02), unless otherwise agreed in writing with Natural Resources Wales.
“Run-off discharge point” as shown on Figure 8 of the Aftercare Management Plan.	Suspended Solids	Surface Water runoff from capped area via surface water lagoon.	50 (mg/l)		Quarterly	
	Ammoniacal Nitrogen		4 (mg/l)			
	Chloride		150 (mg/l)			
	pH		<6			
	pH		>9			

**Table S3.3 Trigger levels for emissions into groundwater and monitoring requirements**

Monitoring point reference	Parameter	Limit (including unit)	Monitoring frequency	Monitoring standard or method
BH101, BH103, BH104, BH105, BH117 as shown on Figure 11 of the Aftercare Management Plan.	Ammoniacal Nitrogen	10 mg/l	Quarterly	Unless otherwise agreed in writing with Natural Resources Wales, monitoring methods used shall be in accordance with Environment Agency document "Guidance on monitoring of landfill leachate, groundwater and surface water" (LFTGN02).
	Potassium	40 mg/l		
	Chloride	250 mg/l		

Table S3.4Landfill gas in external monitoring boreholes – limits and monitoring requirements				
Monitoring point Ref. /description	Parameter	Limit (including units)	Monitoring frequency	Monitoring standard or method
BH102, BH106, BH107, BH109, BH110, BH111, BH112, BH113, BH114, BH115, BH116, BH117, BH118, BH119, BH120, BH204 as shown on Figure 11 of the Aftercare Management Plan.	Methane	1% v/v	Quarterly	Unless otherwise agreed in writing with Natural Resources Wales, monitoring methods used shall be in accordance with Environment Agency document “Guidance on the management of landfill gas” (LFTGN03).
	Carbon Dioxide	-		
	Oxygen			
	Differential Pressure			
	Temperature			
	Meteorological Conditions			
	Atmospheric Pressure			

Table S3.5 Landfill gas from capped surfaces – limits and monitoring requirements				
Monitoring point Ref. /description	Parameter	Limit (including unit)	Monitoring frequency	Monitoring Standard or method
Permanently capped zone	Average Methane flux <sup>2</sup>	Where a rate of 0.001 mg/m <sup>2</sup> /second is exceeded appropriate measures must be taken to reduce the rate <sup>2</sup> .	Annually	Flame ionisation detector walkover, flux box or as otherwise agreed in writing with Natural Resources Wales <sup>1</sup> .
Temporarily capped zone	Average Methane flux	Where a rate of 0.1 mg/m <sup>2</sup> /second is exceeded appropriate measures must be taken to reduce the rate.		Flame ionisation detector walkover, flux box or as otherwise agreed in with Natural Resources Wales.

**Note 1** If a cap has previously been shown compliant and there have been no significant physical changes in the gas management during the year, a detailed walkover survey with an FID can be used to demonstrate that the surface emissions are under control. If this survey shows no change in the pattern of methane emission, it may be used as the annual survey. The values for flux and total methane emissions measured in the previous year may be reported and a fresh flux box survey is not necessary. If the zone remains stable, the results of a full walkover survey may be accepted as the site report for a period of four years before a further quantitative flux box survey is required.

**Note 2:** An alternative method of monitoring landfill gas emissions from capped area can also be agreed in writing with Natural Resources Wales. For example the operator can use methane surface concentrations surveys, although separate limits will need to be agreed (e.g. methane concentration in ppm).

Table S3.6 Landfill gas – other monitoring requirements				
Emission point reference or source or description of point of measurement	Parameter	Monitoring frequency	Monitoring standard or method	Other specifications
All gas collection wells and any other (in-waste) gas monitoring points	Methane			
	Carbon Dioxide			
	Oxygen			
	Balance Gas			
	Carbon Monoxide			



Table S3.6 Landfill gas – other monitoring requirements				
Emission point reference or source or description of point of measurement	Parameter	Monitoring frequency	Monitoring standard or method	Other specifications
	Atmospheric pressure	Monthly unless otherwise agreed in writing unless otherwise agreed in writing with Natural Resources Wales.	Unless otherwise agreed in writing with Natural Resources Wales, monitoring methods used shall be in accordance with Environment Agency document “Guidance on the management of landfill gas” (LFTGN03).	On an annual basis the operator shall submit an up to date scale plan detailing the locations of all in-waste monitoring/ extraction points installed at the installation. Each borehole shall be referenced with a unique identifier
	Differential pressure			
	Meteorological Data			
	Hydrogen sulphide	Six Monthly		
	Water Level			
Phase 1 landfill gas main extraction line, prior to connection with phase 2 gas main and prior to treatment at the gas compound.	Methane	Monthly unless otherwise agreed in writing with Natural Resources Wales.	Unless otherwise agreed in writing with Natural Resources Wales, monitoring methods used shall be in accordance with Environment Agency document “Guidance on the management of landfill gas” (LFTGN03) and “Guidance for monitoring trace components in landfill gas” (LFTGN04).	-
	Carbon Dioxide			
	Oxygen			
	Carbon Monoxide			
	Balance Gas			
	Atmospheric pressure			
	Differential pressure			
	Meteorological Data			
	Hydrogen Sulphide	Six Monthly		

Table S3.7 Leachate– other monitoring requirements			
Emission point reference or source or description of point of measurement	Parameter	Monitoring frequency	Monitoring standard or method
Leachate Monitoring Point L1 as shown on Figure 11 of the Aftercare Management Plan.	pH	Six Monthly	In accordance with Environment Agency document “Guidance on monitoring of landfill leachate, groundwater and surface water” (LFTGN02).
	Temperature		
	Alkalinity		
	Dissolved Oxygen		
	Electrical conductivity		
	Hardness		
	BOD		
	COD		
	Total Organic Carbon		
	Total Oxidised Nitrogen		
	Calcium		
	Magnesium		
	Chloride		
	Potassium		
	Sodium		

Table S3.7 Leachate– other monitoring requirements			
Emission point reference or source or description of point of measurement	Parameter	Monitoring frequency	Monitoring standard or method
	Sulphate		
	Phosphate		
	Phosphorous		
	Ammoniacal Nitrogen		
	Arsenic		
	Barium		
	Beryllium		
	Boron		
	Cadmium		
	Chromium		
	Copper		
	Iron		
	Lead		
	Manganese		
	Mercury		
	Nickel		
	Zinc		
	Organochlorine pesticides		
	Organophosphorous Pesticides		
	Polyaromatic Hydrocarbons		
	Triazine Herbicides		
	VOCs		
	SVOCs		
	Depth to Base of Monitoring Well	Annually	

Table S3.8 Surface water – other monitoring requirements				
Emission point reference or source or description of point of measurement	Parameter	Monitoring frequency	Monitoring standard or method	Other requirements
“French Drain” and “Run-off discharge point” as shown on Figure 8 of the Aftercare Management Plan.	Visual inspection for evidence of contamination	Quarterly	Unless otherwise agreed in writing with Natural Resources Wales, monitoring methods used shall be in accordance with Environment Agency document “Guidance on monitoring of landfill leachate, groundwater and surface water” (LFTGN02).	Surface Water monitoring results shall be reviewed against the results of the upgradient monitoring points, which are monitored as part of the Phase 2 facility and the separate leachate treatment facility.
	pH			
	Temperature			
	Ammoniacal Nitrogen			
“Run-off discharge point” as shown on Figure 8 of the Aftercare Management Plan.	Suspended Solids			
SW1 and SW4 as shown on Figure 11 of the Aftercare Management Plan	Visual inspection for evidence of contamination			
	pH			
	Temperature			
	Ammoniacal Nitrogen			
	Dissolved Oxygen			
	Electrical Conductivity			
	Chloride			
	Potassium			
	Alkalinity			
	Suspended Solids			

**Table S3.9 Groundwater – other monitoring requirements**

Emission point reference or source or description of point of measurement	Parameter	Monitoring frequency	Monitoring standard or method	Other requirements
BH101, BH103, BH104, BH105, BH117 as shown on Figure 11 of the Aftercare Management Plan.	Groundwater Level	Quarterly unless otherwise agreed in writing with Natural Resources Wales	Unless otherwise agreed in writing with Natural Resources Wales, monitoring methods used shall be in accordance with Environment Agency document "Guidance on monitoring of landfill leachate, groundwater and surface water" (LFTGN02).	Groundwater monitoring results shall be reviewed against the results of the upgradient monitoring points, which are monitored as part of the Phase 2 facility.
	pH			
	Temperature			
	Alkalinity			
	Dissolved Oxygen			
	Electrical Conductivity			
	Chloride			
	Potassium			
	Ammoniacal Nitrogen			
	Hardness	Six Monthly unless otherwise agreed in writing with Natural Resources Wales		
	BOD			
	COD			
	Total Organic Carbon			
	Total Oxidised Nitrogen			
	Calcium			
	Magnesium			
	Chloride			
	Potassium			
	Sodium			
	Sulphate			
	Phosphate			
	Phosphorous			
	Ammoniacal Nitrogen			
	Arsenic			
	Barium			
	Beryllium			
	Boron			
	Cadmium			
	Chromium			
	Copper			
	Iron			
	Lead			
	Manganese			
	Mercury			
Nickel				
Zinc				
Organochlorine pesticides				
Organophosphorous Pesticides				
Polyaromatic Hydrocarbons				
Depth to Base of Monitoring Well	Annual			

## Schedule 4 - Reporting

Parameters, for which reports shall be made, in accordance with conditions of this permit, are listed below.

<b>Table S4.1 Reporting of monitoring data</b>			
<b>Parameter</b>	<b>Emission or monitoring point/reference</b>	<b>Reporting period</b>	<b>Period begins</b>
Leachate levels As required by condition 3.5.1	In-Waste Leachate Inspection Chambers LC 1 to 22 as shown on Figure 11 of the Aftercare Management Plan.	Every 3 months	1 January, 1 April, 1 July, 1 October
Emissions to water Parameters as required by condition 3.5.1	"French Drain" and "Run-off discharge point" as shown on Figure 8 of the Aftercare Management Plan.	Every 3 months	1 January, 1 April, 1 July, 1 October
Groundwater Parameters as required by condition 3.5.1	BH101, BH103, BH104, BH105, BH117 as shown on Figure 11 of the Aftercare Management Plan.	Every 3 Months	1 January, 1 April, 1 July, 1 October
Landfill gas surface emissions Parameters as required by condition 3.5.1		Every 12 months	1 <sup>st</sup> January
Landfill gas lateral migration Parameters as required by condition 3.5.1	BH102, BH106, BH107, BH109, BH110, BH111, BH112, BH113, BH114, BH115, BH116, BH117, BH118, BH119, BH120, BH204 as shown on Figure 11 of the Aftercare Management Plan.	Every 3 months	1 January, 1 April, 1 July, 1 October
Other Landfill gas monitoring Parameters as required by condition 3.5.1	All gas collection wells and any other (in-waste) gas monitoring points and gas inlet.	Every 3 months	1 January, 1 April, 1 July, 1 October
Other leachate monitoring Parameters as required by condition 3.5.1	Leachate Monitoring Point L1 as shown on Figure 11 of the Aftercare Management Plan	Every 6 months	1 <sup>st</sup> January and 1 <sup>st</sup> October
Other surface water monitoring Parameters as required by condition 3.5.1	"French Drain" and "Run-off discharge point" as shown on Figure 8 of the Aftercare Management Plan and SW1 and SW4 as shown on Figure 11 of the Aftercare Management Plan	Every 3 months	1 January, 1 April, 1 July, 1 October
Other groundwater monitoring Parameters as required by condition 3.5.1	BH101, BH103, BH104, BH105, BH117 as shown on Figure 11 of the Aftercare Management Plan and Groundwater monitoring results from the upgradient monitoring points, which are monitored as part of the Phase 2 landfill	Every 3 months	1 January, 1 April, 1 July, 1 October

<b>Table S4.2: Annual production/treatment</b>	
<b>Leachate:</b> Disposed of off site; Disposed of to any onsite effluent treatment plant.	Cubic metres/year
<b>Surface water and/ or groundwater:</b> Disposed of off site; Disposed of to any onsite effluent treatment plant.	Cubic metres/year
<b>Landfill gas:</b> combustion in flares; combustion in gas engines; Other methods of gas utilisation.	Normalised cubic metres/year

<b>Table S4.3 Reporting Forms</b>		
<b>Media/parameter</b>	<b>Reporting Format</b>	<b>Date of Form</b>
Leachate	Form leachate 1 or other reporting format to be agreed in writing with Natural Resources Wales	27/05/15
Controlled water	Form Water 1 or other reporting format to be agreed in writing with Natural Resources Wales	27/05/15
Groundwater	Form Groundwater 1 or other reporting format to be agreed in writing with Natural Resources Wales	27/05/15
Landfill gas	Form LFG 1 or other reporting format to be agreed in writing with Natural Resources Wales	27/05/15
Landfill topographical surveys and interpretation	Reporting format to be agreed in writing with Natural Resources Wales	27/05/15

## Schedule 5 - Notification

This page outlines the information that the operator must provide.

Units of measurement used in information supplied under Part A and B requirements shall be appropriate to the circumstances of the emission. Where appropriate, a comparison should be made of actual emissions and authorised emission limits.

If any information is considered commercially confidential, it should be separated from non-confidential information, supplied on a separate sheet and accompanied by an application for commercial confidentiality under the provisions of the EP Regulations.

### Part A

Permit Number	
Name of operator	
Location of Facility	
Time and date of the detection	

<b>(a) Notification requirements for any activity that gives rise to an incident or accident which significantly affects or may significantly affect the environment</b>	
<b>To be notified Immediately</b>	
Date and Time of the event	
Reference or description of the location of the event	
Description of where any release into the environment took place	
Substances(s) potentially released	
Best estimate of the quantity or rate of release of substances	
Measures taken, or intended to be taken, to stop any emission	
Description of the failure or accident.	

<b>(b) Notification requirements for the breach of a permit condition</b>	
<b>To be notified immediately</b>	
Emission point reference/ source	
Parameter(s)	
Limit	
Measured value and uncertainty	
Date and time of monitoring	
Measures taken, or intended to be taken, to stop the emission	

Time periods for notification following detection of a breach of a limit	
Parameter	Notification period

<b>(c) In the event of a breach of permit condition which poses an immediate danger to human health or threatens to cause an immediate significant adverse effect on the environment:</b>	
<b>To be notified immediately</b>	
Description of where the effect on the environment was detected	
Substances(s) detected	
Concentrations of substances detected	
Date of monitoring/sampling	

### Part B to be supplied as soon as practicable

Any more accurate information on the matters for notification under Part A.	
Measures taken, or intended to be taken, to prevent a recurrence of the incident	
Measures taken, or intended to be taken, to rectify, limit or prevent any pollution of the environment which has been or may be caused by the emission	
The dates of any unauthorised emissions from the facility in the preceding 24 months.	

<b>Name*</b>	
<b>Post</b>	
<b>Signature</b>	
<b>Date</b>	

\* authorised to sign on behalf of the operator

## Schedule 6 - Interpretation

*“accident”* means an accident that may result in pollution.

*“annually”* means once every year.

*“application”* means the application for this permit, together with any additional information supplied by the operator as part of the application and any response to a notice served under Schedule 5 to the EP Regulations.

*“authorised officer”* means any person authorised by Natural Resources Wales under section 108(1) of The Environment Act 1995 to exercise, in accordance with the terms of any such authorisation, any power specified in section 108(4) of that Act.

*“Background concentration”* means such concentration of that substance as is present in:

- For emissions to surface water, the surface water quality up-gradient of the site; or
- For emissions to sewer, the surface water quality up-gradient of the sewage treatment works discharge; or
- For emissions of landfill gas, the ground or air outside the site and not attributable to the site.

*“Construction Proposals”* means written information, at a level of detail appropriate to the complexity and pollution risk, on the design, specifications of materials selected, stability assessment (where relevant) and the construction quality assurance (CQA) programme in relation to the Landfill Infrastructure.

*“CQA Validation Report”* means the final “as built” construction and engineering details of the Landfill Infrastructure. It must provide a comprehensive record of the construction and must include, where relevant:

- The results of all testing required by the CQA programme - this must include the records of any failed tests with a written explanation, details of the remedial action taken, referenced to the appropriate secondary testing;
- Plans showing the location of all tests;
- “As-built” plans and sections of the works;
- Copies of the site engineer’s daily records;
- Records of any problems or non-compliances and the solution applied;
- Any other site specific information considered relevant to proving the integrity of the Landfill Infrastructure;
- Validation by a qualified person that all of the construction has been carried out in accordance with the Construction Proposals.

*“D”* means a disposal operation provided for in Annex I to Directive 2008/98/EC of the European Parliament and of the Council on waste.

*“emissions to land”* includes emissions to groundwater.

*“emissions of substances not controlled by emission limits”* means emissions of substances to air, water or land from the activities, either from the emission points specified in schedule 3 or from other localised or diffuse sources, which are not controlled by an emission or background concentration limit..

*“EP Regulations”* means The Environmental Permitting (England and Wales) Regulations SI 2010 No.675 and words and expressions used in this permit which are also used in the Regulations have the same meanings as in those Regulations.

*“groundwater”* means all water, which is below the surface of the ground in the saturation zone and in direct contact with the ground or subsoil.

*“Landfill Infrastructure”* means any specified element of the:

- permanent capping;
- leachate abstraction systems;



- leachate transfer, treatment and storage systems;
- surface water drainage systems;
- leachate monitoring wells;
- groundwater monitoring boreholes;
- landfill gas monitoring boreholes;
- landfill gas management systems;

within the site.

*“Liquids”* means any liquid other than leachate within the engineered landfill containment system.

*“LFTGN 05”* means Environment Agency Guidance for monitoring enclosed landfill gas flares.

*“LFTGN 07”* means Environment Agency Guidance on monitoring landfill gas surface emissions.

*“LFTGN 08”* means Environment Agency Guidance for monitoring landfill gas engines.

*“M2”* means Environment Agency Guidance Monitoring of stack emissions to air.

*“MCERTS”* means the Environment Agency’s Monitoring Certification Scheme.

*“New Cell”* means any new cell, part of a cell or other similar new area of the site where waste deposit is to commence after issue of this permit and can comprise:

- groundwater under-drainage system;
- permanent geophysical leak location system;
- leak detection layer;
- sub-grade;
- barriers;
- liners;
- leachate collection system;
- leachate abstraction system;
- separation bund/layer;
- cell or area surface water drainage system;
- side wall subgrade and containment systems;

for the New Cell.

*“No impact”* means that the change made to the construction process will not affect the agreed design criteria, specification or performance in a way that has a negative effect.

*“quarter”* means a calendar year quarter commencing on 1 January, 1 April, 1 July or 1 October.

*“R”* means a recovery operation provided for in Annex II to Directive 2008/98/EC of the European Parliament and of the Council on waste.

*“Review of the Hydrogeological Risk Assessment”* means a written review of the hydrogeological risk assessment included in the Application, together with any other parts of the Application that addressed the requirements of the EP Regulations. The review shall assess whether the activities of disposal or tipping for the purpose of disposal of waste authorised by the permit continue to meet the requirements of the EP Regulations.

*“Waste code”* means the six digit code referable to a type of waste in accordance with the List of Wastes (England) Regulations 2005, or List of Wastes (Wales) Regulations 2005, as appropriate, and in relation to hazardous waste, includes the asterisk.

*“Waste Framework Directive”* or *“WFD”* means Waste Framework Directive 2008/98/EC of the European Parliament and of the Council on waste.

Where a minimum limit is set for any emission parameter, for example pH, reference to exceeding the limit shall mean that the parameter shall not be less than that limit.

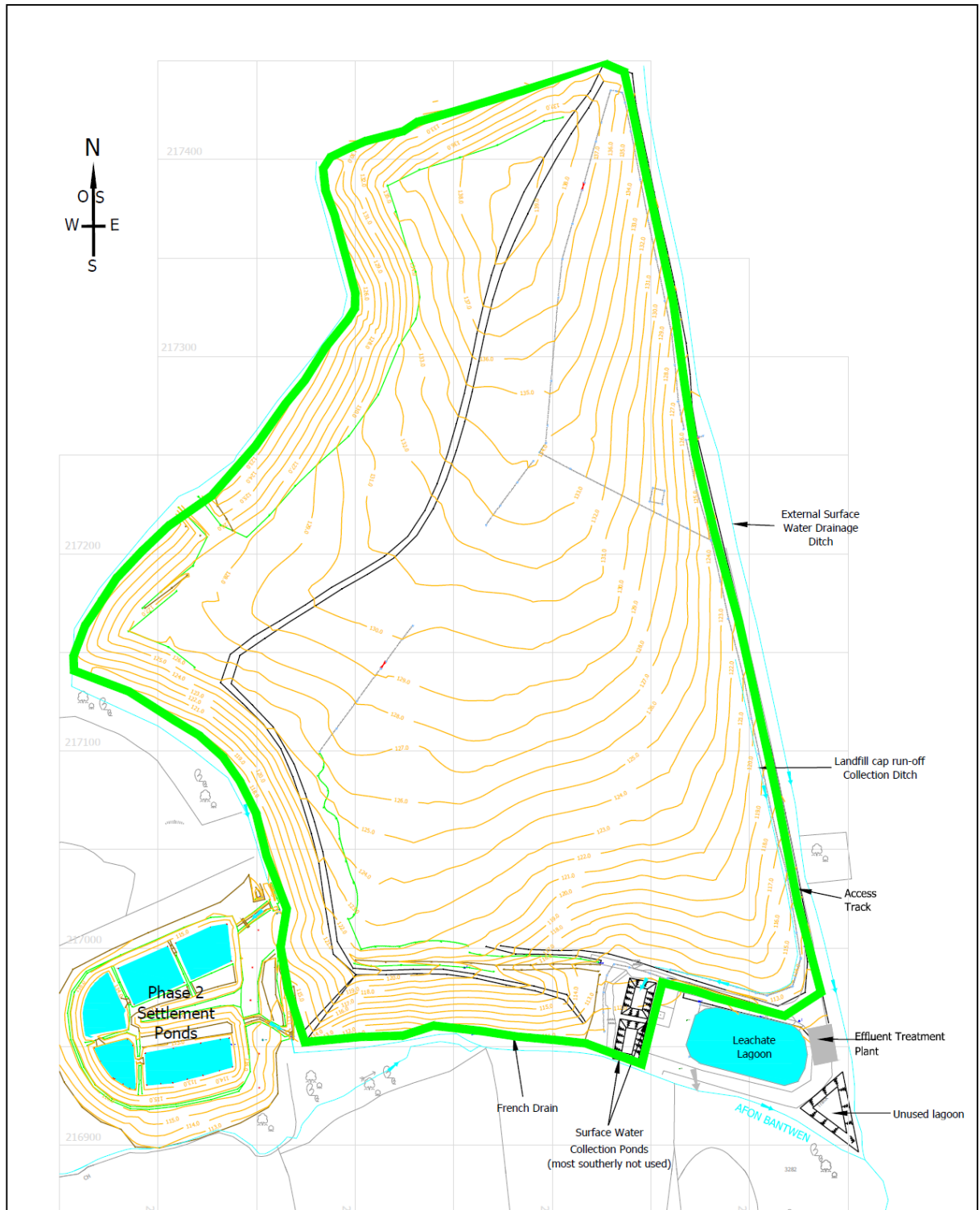
Unless otherwise stated, any references in this permit to concentrations of substances in emissions into

air means the standards included in Environment Agency Guidance for Monitoring Enclosed Landfill Gas Flares LFTGN 05 or Guidance for Monitoring Landfill Gas Engine Emissions LFTGN 08.

“year” means calendar year ending 31 December.

# Schedule 7 - Site plan

This is the site map the permit refers to.



End of permit.

Permit Number: EPR/TP3298FH  
Facility: NantycawsLandfill Phase 1

Operator: Carmarthenshire County Council  
Form Number: Water1 / 27/05/15

**Reporting of emissions to water (other than to sewer) and land for the period from DD/MM/YYYY to DD/MM/YYYY**

Emission Point	Substance / Parameter	Emission		Result <sup>[1]</sup>	Test Method <sup>[2]</sup>	Sample Date and Times <sup>[3]</sup>	Uncertainty <sup>[4]</sup>
		Limit Value	Reference Period				

- [1] The result given is the maximum value (or the minimum value in the case of a limit that is expressed as a minimum) obtained during the reporting period, expressed in the same terms as the emission limit value. Where the emission limit value is expressed as a range, the result is given as the 'minimum – maximum' measured values.
- [2] Where an internationally recognised standard test method is used the reference number is given. Where another method that has been formally agreed with Natural Resources Wales is used, then the appropriate identifier is given. In other cases the principal technique is stated, for example gas chromatography.
- [3] For non-continuous measurements the date and time of the sample that produced the result is given. For continuous measurements the percentage of the process operating time covered by the result is given.
- [4] The uncertainty associated with the quoted result at the 95% confidence interval, unless otherwise stated.

Signed .....  
(Authorised to sign as representative of Operator)

Date.....

Permit Number: EPR/TP3298FH  
 Facility: Nantycaws Landfill Phase 1

Operator: Carmarthenshire County Council  
 Form Number: Leachate 1 / 27/05/15

**Reporting of leachate monitoring for the period from DD/MM/YYYY to DD/MM/YYYY**

Monitoring Point	Substance / Parameter	Compliance limit	Reference Period	Result <sup>[1]</sup>	Test Method <sup>[2]</sup>	Sample Date and Times <sup>[3]</sup>	Uncertainty <sup>[4]</sup>

- [1] The result given is the maximum value (or the minimum value in the case of a limit that is expressed as a minimum) obtained during the reporting period, expressed in the same terms as the emission limit value. Where the emission limit value is expressed as a range, the result is given as the 'minimum – maximum' measured values.
- [2] Where an internationally recognised standard test method is used the reference number is given. Where another method that has been formally agreed with Natural Resources Wales is used, then the appropriate identifier is given. In other cases the principal technique is stated, for example gas chromatography.
- [3] For non-continuous measurements the date and time of the sample that produced the result is given. For continuous measurements the percentage of the process operating time covered by the result is given.
- [4] The uncertainty associated with the quoted result at the 95% confidence interval, unless otherwise stated.

Signed .....

Date..... (Authorised to sign as representative of Operator)

Permit Number: EPR/TP3298FH  
 Facility: Nantycaws Landfill Phase 1

Operator: Carmarthenshire County Council  
 Form Number: Groundwater1 / 27/05/15

**Reporting of groundwater monitoring for the period from DD/MM/YYYY to DD/MM/YYYY**

Monitoring Point	Substance / Parameter	Trigger level	Reference Period	Result <sup>[1]</sup>	Test Method <sup>[2]</sup>	Sample Date and Times <sup>[3]</sup>	Uncertainty <sup>[4]</sup>

- [1] The result given is the maximum value (or the minimum value in the case of a limit that is expressed as a minimum) obtained during the reporting period, expressed in the same terms as the emission limit value. Where the emission limit value is expressed as a range, the result is given as the 'minimum – maximum' measured values.
- [2] Where an internationally recognised standard test method is used the reference number is given. Where another method that has been formally agreed with Natural Resources Wales is used, then the appropriate identifier is given. In other cases the principal technique is stated, for example gas chromatography.
- [3] For non-continuous measurements the date and time of the sample that produced the result is given. For continuous measurements the percentage of the process operating time covered by the result is given.
- [4] The uncertainty associated with the quoted result at the 95% confidence interval, unless otherwise stated.

Signed .....  
 (Authorised to sign as representative of Operator)

Date.....

Permit Number: EPR/TP3298FH  
Facility: Nantycaws Landfill Phase 1

Operator: Carmarthenshire County Council  
Form Number: LFG1 / 27/05/15

**Reporting of landfill gas monitoring for the period from DD/MM/YYYY to DD/MM/YYYY**

Monitoring Point	Substance / Parameter	Compliance limit	Reference Period	Result <sup>[1]</sup>	Test Method <sup>[2]</sup>	Sample Date and Times <sup>[3]</sup>	Uncertainty <sup>[4]</sup>

- [1] The result given is the maximum value (or the minimum value in the case of a limit that is expressed as a minimum) obtained during the reporting period, expressed in the same terms as the emission limit value. Where the emission limit value is expressed as a range, the result is given as the 'minimum – maximum' measured values.
- [2] Where an internationally recognised standard test method is used the reference number is given. Where another method that has been formally agreed with Natural Resources Wales is used, then the appropriate identifier is given. In other cases the principal technique is stated, for example gas chromatography.
- [3] For non-continuous measurements the date and time of the sample that produced the result is given. For continuous measurements the percentage of the process operating time covered by the result is given.
- [4] The uncertainty associated with the quoted result at the 95% confidence interval, unless otherwise stated.

Signed .....  
(Authorised to sign as representative of Operator)

Date.....