

This form will report compliance with your permit as determined by an NRW officer

Site	Bryn Posteg Landfill	Permit Ref	BU77661C	
Operator/Permit holder	Sundorne Products (Ilanidloes) Ltd			
Regime	Installations			
Date of assessment	18/04/2018 - 19/04/2018	Time in	09:00	Out 14:30
Assessment type	Audit			
Parts of the permit assessed	all below			
Lead officer's name	Ellis, Rhys			
Accompanied by	McClymont, James, Aled Rees, Roberts, Anthony			
Recipient's name/position	David Williams/ Technical manager	Date issued	23/05/2018	

Section 1 – Compliance Assessment Summary

This is based on the requirements of the permit under the Environmental Permitting Regulations or the licence under the Water Resources Act 1991 as amended by the Water Act 2003. A detailed explanation is captured in "Compliance Assessment Report Detail" (Section 2) and any actions you may need to take are given in the "Action(s)" (section 4). This summary details where we believe any non-compliance with the permit has occurred, the relevant condition and how the non-compliance has been categorised using our Compliance Classification Scheme (CCS). CCS Scores can be consolidated or suspended where appropriate, to reflect the impact of some non-compliances more accurately. For more details of our CCS scheme, contact your local office.

Permit conditions and compliance summary	CCS Category	Condition(s) breached
B1 - Infrastructure - Engineering for prevention and control of emissions	C2	2.9.1
C1 - General Management - Staff competency/training	C2	1.1.1
E1 - Emissions - Air	C2	3.1.1
E2 - Emissions - Land and groundwater	C3	3.7.4
F1 - Amenity - Odour	C2	3.3.1
G1 - Monitoring and Records, Maintenance and Reporting - Monitoring of emissions and environment	C3	1.1.1

KEY: See Section 5 for breach categories, suspended scores will be indicated as such.
A = Assessed or assessed in part (no evidence of non-compliance), **X** = Action only,
O = Ongoing non-compliance, not scored.

Number of breaches recorded	6	Total compliance score (see section 5 for scoring scheme)	132
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If the Number of breaches recorded is greater than zero, please see Section 3 for our proposed enforcement response

Section 2 – Compliance Assessment Report Detail

This section contains a report of our findings and will usually include information on:

- The part(s) of the permit that were assessed (eg. Maintenance, training, combustion plant, etc)
- Where the type of assessment was 'Data Review' details of the report/results triggering the assessment
- Any non-compliances identified
- Any non-compliances with directly applicable legislation
- Details of any multiple non-compliances
- Information on the compliance score accrued inc.
- Details of advice given
- Any other areas of concern
- Any actions requested
- Any examples of good practice
- A reference to photos taken

This CAR Form covers the inspections undertaken at Bryn Posteg Landfill Site on the 13th April 2018 and an audit on the 18th/19th April 2018.

Inspection – 13th April 2018.

Present on site today were regulating officer James McClymont from Natural Resources Wales and Ewan Thomas from Geotechnology Limited.

The following was noted during the visit .

Surface water discharge

The surface water discharge to the west of site was examined, there was very little flow, and it appeared clearer than during recent visits. This is likely to be due to lower levels of rainfall.

Gas infrastructure and management

The leachate towers in Phase 9D/E had been connected to the gas extraction system, however, it was determined that no gas extraction had yet commenced. Methane concentrations of 358,000 ppm (35.8 %) were detected at the base of one of the towers, and 535,000 ppm (53.5 %) emanating from a joint in the concrete rings. Methane concentration of 320,000 ppm (32.0 %) was detected at the base of another of the leachate towers.

There are several areas where gas could be seen bubbling through leachate on Phase 9. Methane concentrations ranging between 2000 ppm (0.2 %) and 340,000 ppm (34.0 %) were detected and emanating from such holes.

It was noted that some improvements were being made to the gas wells on Phase 9D/E while the officer was on site. This involved the re-applying of bentonite seals to the bases of some wells, and the excavation of the top layer of waste to form banks for connection pipework to be laid upon. The excavation of waste was causing odour locally.

It was highlighted to operator that the above would be further reviewed during our landfill gas audit in the week following.

Leachate management

There were several suspected leachate outbreaks along the southern and western edges of Phase 9D. This included from area which had recently received capping works. The suspected leachate was pooling and running along the haul road, and there were concerns that this was draining to ground or to surface water. Contaminated surface water was also seen to be pooling at the top of Phase 9D, which has been running down the capping on the southern flank, to the haul road.

The above demonstrate a possible loss of leachate containment, which should be investigated immediately.

Material brought on to site

A stockpile of material (soils and stone) was noted on the haul road next to the MRF. While the officer was on site, this material was being taken by dump truck onto the landfill, where it was being used to assist with the laying of the landfill gas connection pipework – to achieve adequate falls. The officer spoke to Tony Webber regarding this material and he was told that the material had been brought to site this week by John Baker & Sons. The following information was requested by email on the 13th April 2018.

- The source of this material
- Quantities
- Is this material a waste?
- Copies of documentation/waste transfer notes

To date no response has been received. Please could you respond as soon as possible in regards to this matter. Once we receive this information we will consider whether there are any breaches of permit conditions / suspension notice that is in place for the site.

Odour

During the inspection significant landfill gas odour was detected at several points. The officer also detected an offsite landfill gas

odour.

In the follow up e-mail, the officers requested an update detailing what steps you are/will be taking to address these ongoing significant issues.

Audit – 18th and 19th April 2018

Present on site today from Natural Resources Wales were regulating officers Rhys Ellis and James McClymont, Senior Environment Officer (Landfill Gas Technical Specialist) Anthony Roberts and Environment Officer - Aled Rees.

Present from Sundorne Products Limited was David Williams (Technical Manger). Officers also spoke to Paul Lloyd (Gas monitoring Technician) whilst on site. Thank you for your time during the audit.

The main purpose of the audit was to look at gas management and infrastructure. The objective was to ensure that the operational status of the extraction system is best practice and at maximal efficiency and that it is being operated and maintained so as to maximise gas collection efficiency and minimise fugitive gas emissions. An ATEX certified, Gazomat inspectra Laser Methane Analyser was used to perform emission testing at the site. (Certificate attached).

The objective was to look at the behaviours of the perimeter gas wells (pressure and gas readings etc) and also undertake an emission survey on the landfill.

The audit also aimed to better understand the behaviour of the leachate on site.

Below is a summary of findings which are considered into 8 main sections of interest. Within each section are recommendations and actions to be taken by the operator.

1. Surface emission surveying (particularly on cell 9)
2. Gas collection
3. Leachate chambers
4. Basal Leachate
5. Perimeter monitoring
6. Landfill gas and combustion compound
7. Other observations
8. Breaches of permit conditions

Appendix

Appendix 1 –Surface emission survey

Appendix 2 – Photo album

Appendix 3 – Perimeter wells readings and comments

1. Surface emission surveying

Appendix 1 summarises the methane emission survey undertaken on site during both days.

In summary cell 9 (including the operational areas) showed high concentration of methane at multiple emission points. Emission points included the site surface, the base of features such as gas and leachate wells and the waste flanks.

Examples included

- surface emission from the northern end of phase 9D reaching a maximum methane concentration of 63%,
- surface emission from the south west recording levels of 21.9%
- emission from bases of leachate wells in cell 9D/E ranged between 17% and 43.2%
- methane and emissions were detected on gas well bases, such as at GW300 where 4000ppm methane was detected.
- In one area a hole in the flank showed methane forcing its way out under pressure and readings of 21.9% was noted in the (south west corner of cell 9D.

(see photos 4 -10 and photos 19 and 20 of appendix 2)

These emission must be contained, and urgent action should be taken to improve infrastructure to achieve this.

2. Gas collection infrastructure.

Although improvements have been made to the falls of the gas collection pipework on phase 9D/E, Connecting pipe-work and pipe-work connecting wells to gas mains should be re-laid to a fall of a minimum 1 in 25 over waste where gas flow is not in the direction of water flow and 1 in 50 where it is Over made ground and virgin ground the fall may be reduced to 1in 100. The continual blocking of pipework with condensate is unacceptable to NRW and negatively effects the extraction efficiency of the system.

Please refer to Photos 11 to 15 which show examples of observations noted.

It was discussed that the following actions are required to be taken by the operator.

ACTION 1

- Further re-laying of gas collection pipelines so condensate flow is in the direction of gas flow;
- Regular de-watering of gas connection pipelines;

Please provide NRW with a timeframe for the above work no later than 01/06/2018

Gas well 300 showed a very high positive pressure demonstrating uncollected accumulations of gas under pressure. This will inevitably lead to high emissions. Gas extraction in this area is inadequate and must be improved.

ACTION 2

The positive pressure in this well should be investigated and any perched water should be removed as a matter of urgency, as there is no flow from this well in a critical area for extraction and emissions reduction. This well also showed very high H₂S levels. Findings should be forwarded to Natural Resources Wales no later than 01/06/2018.

ACTION:3

This well should be sampled for H₂S and results forwarded to NRW by 1st June 2018.

The audit also showed that of two wells present in the northern section of the operational area, GW300 had a high positive pressure and no flow and the other well in this area had very limited flow. This means that the area is largely unextracted.

ACTION 4

It was agreed that this area requires immediate improvements in gas control, including:

- Installation of at least two new drilled gas wells
- Installation of horizontal /pin wells at a shallower depth; and
- Re instate gas flow to wells already in this area
- Regular inspection of pumps in gas wells to reduce perched leachate(with records); and
- Regular dips to leachate for all gas wells on phase 9D/E, to demonstrate extent of perched leachate levels.
- Results of dipping survey should be submitted to NRW as soon as possible.

Please provide NRW with an improvement plan with timeframe for the above work by 01/06/2018

Hydrogen sulphide concentrations is very high in cell 9D/E and odour noticed in the ambient air. It is vital that extraction infrastructure is improved to reduce the odour and health and safety impacts from this area.

The high emissions in the current operational area are indicative of an inefficient extraction system. All wells (including leachate wells) should be checked for sealing, perched leachate and air ingress.

The base of cell 9D has a pond of perched water overlaying the waste. This is a confined area with high gas production with the potential of generating emissions and odour.

ACTION 5

This area must be de-watered urgently and gas extraction infrastructure improved considering all appropriate health and safety measures and update provided on progress by 01/06/2018.

Please refer to Photograph 17 and 18 in appendix 2 .

3. Leachate Chambers

Significant methane readings were detected around 4 of the leachate towers in Cell 9D/E. As previously highlighted in previous inspections these require engineering works to re seal the juncture between the wells and the waste, using recognised engineering techniques and best practice. From evidence gathered on site serious odour were detected in this area and is believed to be contributing to the complaints made by local residents and therefore must be addressed with the utmost urgency.

All leachate wells must be connected to the landfill gas extraction system and be subject to extraction pressure.

Some of the leachate towers are too high for safe sampling and access. Reduction in the height of all such leachate chambers on phase 9D should be prioritised during engineering works to seal these towers.

It is imperative that these wells are adequately sealed using systems such as the installation of a top hat and robust sealing on all leachate chambers on phase 9D, which will include access ports for monitoring and pump insertion.

Photograph 16 in appendix 2 is an example of one of these high leachate towers where high methane readings were also noted around the base.

ACTION 6

Adequate and efficient suction on each leachate chamber must be established as a matter of urgency to improve landfill gas collection efficiency, reduce impact on the environment and improve the amenity of the locality

It was our understanding that the following is required immediately;

- Reduction in the height of all leachate chambers in phase 9D/E
- Installation of top hat and robust sealing on all leachate chambers on Phase 9D/E; and
- Top hats to include access ports for monitoring
- Adequate and efficient suction on each chamber

Operator to provide NRW with timeframe for the above works no later than 30/05/2018

There is currently no up to date clear plan of location of leachate chambers on site, and they are not marked clearly on site.

ACTION: 7

- As a matter of priority an as built drawing of all leachate chambers should be submitted with clear notation for each chamber
- Please note -This plan must include the most up to date phasing layout and forwarded to NRW
- The leachate chambers should be clearly marked on site keeping with the nomenclature of the drawing

Operator to provide NRW with timeframe for the above works by 01/06/2018

4. Basal leachate

Basal leachate levels must be established unequivocally using a camera survey. If any breaches of permit levels are established, then any breaches of permit limits must be rectified without delay.

ACTION 8:

You confirmed that you have appointed SGG to undertake a CCTV camera survey on all leachate chambers on phase 9 on 4th May 2018. It was agreed that NRW will be on site on this day to observe.

ACTION 9 :

It was explained to officers that 60 pumps are present in gas and leachate wells on site. These should be surveyed to ensure functionality. Any pumps which are not working should be repaired.

5. Perimeter Monitoring

The perimeter monitoring gas results in APPENDIX 3 contains summaries and actions, detailing issues with the wells and the monitoring system. These actions should be expedited within 2 months of the date of this report. Issues include:

- Bailing tools attached to a rope were present in some gas wells which meant that the well cap could not be sealed. These tools must be removed in between sampling and the lid screwed back on so that it is airtight.
- The identifying numbers on many perimeter wells were inadequate or could not be determined at all. Label all perimeter monitoring wells with clear identification markings.
- Many wells were not sealed as the bungs used as end caps were loose and allowed air into the system. These must be replaced with airtight screw on other form of sealed end cap.
- Although there is still evidence of gas migration from the site, improvements were noted in some critical boreholes during this visit.
- Procedures to ensure boreholes are regularly maintained and protected from damage and the elements should also be put in place.

Photographs illustrating some of these issues can be seen in photograph 23-26 in appendix 2

6. Landfill Gas Utilisation and Combustion Compound

• During the audit, the gas extraction system field suction was adjusted overnight which caused an increase in flow and a significant reduction in methane concentration and increase in oxygen. The site must ensure all points of oxygen ingress both proximal and distal are investigated and sealed and suction pressure is balanced carefully.

ACTION 10

• H₂S concentration in the main inlet gas line to the gas compound is 283ppm. This is relatively high. This may cause metal wear in the engine and higher emissions. The potential for high emissions of SO₂ may also need to be considered.

• ACTION 11

Please confirm what the current oil change intervals are for each engine and respond by 01/06/2018.

- Gas flow is now at 900m³/hr with gas quality over 50% (prior to the increase in field suction). This is an improvement in collection volume and referencing GasSim and other methods of estimating gas production volumes shows a potential improvement in collection efficiency.
- Although volumes of gas to the gas utilisation plant have improved, significant emissions were detected in the current operational phase. This finding would indicate that with further improvements in extraction efficiency can be achieved which is essential for reducing odour complaints and reducing migration and the emission of greenhouse gasses. This will also increase gas volumes for utilisation in line with Landfill Directive requirements.
- The programme logic controller has now been replaced for the flare resulting in improved system control.
- Telemetry for gas monitoring is now in place to allow the remote monitoring of the gas utilisation plant.

7. Other observations during visit

- A trench had been excavated by the operator to contain suspected contaminated runoff that had been previously noted by officer to be pooling at the top of Phase 9D and been running down the capping on the southern flank, to the haul road. (See photos 21 and 22 in appendix 2)
- Officers stressed the importance of ensuring that leachate flowing from cell 9D/E towards the composting pad and waste transfer station is contained. The site must ensure that any leachate generated within the landfill is retained within the landfill. Areas of concerns were pointed out during the audit (particularly alongside the western flank of cell 9D)
- This area might be a contributory factor to the high ammonia readings in the surface water discharge from this part of the site.
- The surface water discharge to the west of site was examined, there was very little flow, and it appeared clearer than during recent visits. This is likely to be due to lower levels of rainfall.
- Site over all appeared much drier today especially in areas such as (9D(ii) opposite the MRF) where previously significant amount of leachate has been visible flowing/cascading out of the flank and into the collection sump, although leachate was still evident flowing the flows were significantly lower this indicates that flows may be rainfall related. See photos 1-3 Appendix 2

8. Breaches of permit :

B1 – Engineering to control Emissions

As a result of the issues and concerns noted above in regards to the engineering of leachate towers resulting in point source emissions and the lack of gas management infrastructure resulting in passive venting of gas for an excessive period of time, some of which are issues that have been on going for a considerable amount of time and have been drawn to the operators attention on numerous occasions. (e.g. Emissions from leachate towers etc) condition 2.9.1 of the permit has been breached.

Condition 2.9.1 stipulates that the operator shall take 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

The operator has not taken appropriate measures, including, but not limited to, those specified in any approved landfill gas management plan to prevent these emissions. As a result, a **CCS score of 2** is applied.

E1 – Emission to air

In addition to this as a result of unauthorised point source emissions to air from sources such as the leachate towers condition 3.1.1 of the permit has been breached. This condition stipulates that there shall be no point source emission to air except from the sources and emission points listed in schedule 3 of the permit. As a result a **CCS score of 2** has been applied.

F1 – Amenity - Odour

Significant gas odours was detected on site on both visits (13/04/2018 and the 18th and 19/04/2018) particularly on cell 9D. This is considered to be due to inefficient extraction of gas and gas emissions from sources such as the leachate towers. It is believed that in particular the leachate towers were contributing significantly to the recent complaints made by local residents. This is strengthened by the fact that odours were detected off site by an officer on the 13th April inspection and that Natural Resources Wales received off-site complaints of odour on the same day of our visits being 13/04/2018 and 19/04/2018.

For this reason, permit condition 3.3.1 has been breached as serious odours and emissions were detected on cell 9D both on the audit days and previous inspection on the 13th April. These are at levels that are giving rise to pollution outside the site, as perceived by an authorised officer coupled with the fact that the operator has not used appropriate measures to minimise the odour from site. As a consequence, this breach has also attracted a **CCS Score of 2**.

G1 – Monitoring of emissions and the environment

Due to issues such as maintenance of the perimeter monitoring boreholes not being properly sealed due to the type of bung caps being used, and this allowing air into the system which has the possibility of effecting the sample, a breach has been noted under condition 1.1.1 which refers to management system. A landfill gas management plan forms part of your management system and covers borehole maintenance. There has been a failure in maintaining some of these boreholes as detailed in the landfill gas management plan. The guidance on the management of landfill gas (LFTGN03) highlights the importance of sealing and stipulates "monitoring boreholes should remain sealed at all times to avoid the dilution of landfill gas with air". On this occasion a **CCS score of 3** is applied.

E2 -Emissions to ground

As officers were unable to sample at certain locations due to issues such as broken valve taps on some of the perimeter borehole condition 3.7.4 has been breached which states that 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 . On this occasion a **CCS score of 3** has been applied.

C1- General Management – Staff competency/ training

Permit condition 1.1.1 stipulates that the operator shall manage and operate the activities in accordance with a written management system and using sufficient competent persons and resources. The permit breaches noted in this compliance assessment report form raises concerns about the awareness of permit conditions, management systems and associated procedures and plans by the directors and relevant site personnel. There appears to be a lack of understanding of the permit requirements and a failure to follow relevant procedures resulting in breaches of permit conditions which have led to pollution of environment, these include:

- Gas management and inadequate gas collection for prevention of gas and odour emissions as mentioned above.
- Failure to take measures under permit condition 4.3.1 (b) in that, in the event of any breach of permit condition the operator must immediately take the measures necessary to ensure that compliance is restored within the shortest possible time. An example would be the leachate towers not being connected for a long period of time
- Issues with perimeter boreholes (wells not sealed properly, broken valves and poor maintenance and upkeep of these perimeter monitoring boreholes
- Leachate towers are too high for safe and accurate sampling
- Some of the serious breaches noted today (e.g. emissions from leachate towers and emissions from cell 9D have been drawn to the operator's attention by NRW on numerous occasions and are still outstanding.

A **CCS breach of 2** is noted on this occasion

EPR Compliance Assessment Report

**Report ID:
CAR_NRW0033397**

This form will report compliance with your permit as determined by an NRW officer

Site	Bryn Posteg Landfill	Permit Ref	BU7766IC
Operator/Permit holder	Sundorne Products (Ilanidloes) Ltd	Date	18/04/2018

Section 3 – Enforcement Response

You must take immediate action to rectify any non-compliance and prevent repetition. Non-compliance with your permit conditions constitutes an offence and can result in criminal prosecutions and/or suspension or revocation of a permit. Please read the detailed assessment in Section 2 and the steps you need to take in Section 4 below.

We will now consider what enforcement action is appropriate and notify you, referencing this form.

Section 4 – Action(s)

This section summarises the actions identified during the assessment along with the timescales for when they will need to be completed.

Criteria Ref.	CCS Category	Action required/advised	Due Date
See Section 1 above			
B1	C2	Refer to actions in CAR form (actions 1 - 6)	01/06/2018
E2	C3	Refer to Appendix 3 of report which contains summaries and actions.	23/07/2018
G1	C3	Refer to Appendix 3 of report which contains summarises and actions.	23/07/2018
F1	C2	See actions in CAR form Action 1 - 6	01/06/2018
E1	C2	Refer to Action 6 . Actions 1- 4 also applicable	01/06/2018
C1	C2	Refer to Actions within CAR form as a matter of urgency	01/06/2018

Section 5 – Compliance notes for the Operator

To ensure you correct actual or potential non-compliance we may

- Advise on corrective actions verbally or in writing
- Require you to take specific actions verbally or in writing
- Issue a notice
- Require you to review your procedures or management system
- Change some of the conditions of your permit
- Decide to undertake a full review of your permit

Any breach of a permit condition is an offence and we may take legal action against you

- We will normally provide advice and guidance to assist you to come back into compliance either after an offence is committed or where we consider that an offence is likely to be committed. This is without prejudice to any other enforcement response that we consider may be required.
- Enforcement action can include the issue of a formal caution, prosecution, the service of a notice and/or suspension or revocation of the permit.

See our Enforcement and Civil Sanctions guidance for further information

This report does not relieve the site operator of the responsibility to

- Ensure you comply with the conditions of the permit at all times and prevent pollution of the environment
- Ensure you comply with other legislative provisions which may apply

Non-compliance scores and categories

CCS category	Description	Score
C1	A non-compliance that could have a major environmental effect	60
C2	A non-compliance which could have a significant environmental effect	31
C3	A non-compliance which could have a minor environmental effect	4
C4	A non-compliance which has no potential environmental effect	0.1

Operational Risk Appraisal (Opra) - Compliance assessment findings may affect your Opra score and/or your charges. This score influences the resource we use to assess permit compliance.

Section 6 – General information

Data protection notice

The information on this form will be processed by the Natural Resources Wales (NRW) to fulfil its regulatory and monitoring functions and to maintain the relevant public register(s). The NRW may also use and/or disclose it in connection with:

- Offering/providing you with its literature/services relating to environmental matters
- Consulting with the public, public bodies and other organisations (eg. Health and Safety Executive, local authorities) on environmental issues
- Carrying out statistical analysis, research and development on environmental issues
- Providing public register information to enquirers
- Investigating possible breaches of environmental law
- Assessing customer service satisfaction and improving its service
- Freedom of Information Act/Environmental Regulations request

The NRW may pass it on to its agents/representatives to do these things on its behalf. You should ensure that any persons named on this form are informed of the contents of this data protection notice.

Disclosure of information

The NRW will provide a copy of this report to the public register(s). However, if you consider that any information contained in this report should not be released to the public register(s) on the grounds of commercial confidentiality, you must write to your local area office within fifteen working days of receipt of this form indicating which information it concerns and why it should not be released, giving your reasons in full.

Customer charter

What can I do if I disagree with this compliance assessment report?

If you are unable to resolve the issue with your site officer, you should firstly discuss the matter with officer's line managers using the informal appeals procedure. If you wish to raise your dispute further through our official Complaints and Commendations procedure, phone our general enquiry number 0300 065 3000 (Mon to Fri 08.00 – 18.00) and ask for the Customer Contact team or send an email to enquiries@naturalresourceswales.gov.uk. If you are still dissatisfied you can make a complaint to the Public Services Ombudsman for Wales. For advice on how to complain to the Ombudsman phone their helpline on 0845 607 0987.

Welsh Language

If you would like this form in Welsh please contact your Regulatory Officer.