Cyfoeth Naturiol Cymru Natural Resources Wales

Compliance Assessment Report

Report ID: CAR_NRW0032390

This form will report compliance with your permit as determined by an NRW officer					
Site	Hafod Quarry Landfill	Permit Ref	PP3139GB		
Operator/Permit holder	Cory Environmental (Central) Ltd				
Regime	Installations				
Date of assessment	01/11/2017	Time in	09:30	Out	12:00
Assessment type	Audit				
Parts of the permit assessed	1.1.1, 2.7.4, 3.3.1				
Lead officer's name	McClymont, James				
Accompanied by					
Recipient's name/position	Ian Craven/ NW Area Manager	Date issued	08/01/2018		

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	C3	2.7.4
C2 - General Management - Management system and operating procedures	C3	1.1.1
E1 - Emissions - Air	C2	3.3.1

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	3	Total compliance score (see section 5 for scoring scheme)	39

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

Cory Environmental submitted a Gas Installation CQA Plan to Natural Resources Wales (NRW) on the 31st of July 2017. The plan outlined two types of gas wells Cory Type 1 and Cory Type 2, to be installed in Cell 3 and the operational Cell 4.

The Cory Type 1 well design was determined by NRW to be in accordance with industry infrastructure standards, however the Cory Type 2 well design was not considered to be in accordance with the standards.

In CAR_NRW0032063, issued 25th of August 2017, NRW expressed our concerns regarding the design of the non-standard Cory Type 2 wells. The deviance from best practise, identified issues with the three existing non-standard wells and emissions detected during our landfill gas audit in April 2017, highlighted the inadequacies in the proposed design. If this type of well was to be installed across Cell 4, we did not have confidence that the landfill gas in the cell would be adequately extracted, and considered there to be the potential for significant point source and diffuse emissions due to the design.

On the 12th of September 2017, NRW received an e-mail from Graham Ball (Head of Landfill Gas, Cory Environmental) stating:

"I can confirm we have noted the content of CAR_NRW0032063, but remain firmly of the view that our proposal and resource changes will improve gas abstraction from the Operational Cell. The drill rig is due to arrive on site this week, with drilling to commence Monday 18th September - works are forecasted to take two weeks to complete".

On the 15th of September 2017, James McClymont (Regulatory Officer, Industry Regulation, NRW) replied to Graham Ball stating:

"It remains our opinion that there is the potential for significant point source and diffuse landfill gas emissions due to the design of the Cory Type 2 wells. Consequently, we will be focusing on these wells during future audits. I'm planning to visit site next week to observe progress".

Following this e-mail, James McClymont conducted five site audits, between September and November, focusing on the non-standard gas wells in Cell 4. For the first three audits James was accompanied by Rhys Ellis (Regulatory Officer, Industry Regulation, NRW).

Methane emissions at the non-standard wells were measured using a Gazomat Inspectra Laser. The findings of the audits are summarised below, with full methane emission results attached.

20th September 2017 (10:30 - 12:30)

- No new non-standard wells had been installed in Cell 4;
- The installation of a standard gas well in Cell 3 was observed.

27th September 2017 (13:45 - 15:30)

- A total of 4 new non-standard wells had been installed in Cell 4 - HOLL13, HOLL14, HOLL16 and HOLL17. These wells had received a steel gas hat, but were not connected to the gas extraction system;
- Methane emissions were detected at the bases of all new non-standard wells, with significant emissions detected at HOLL13 (115,000 ppm) and HOLL14 (200,000 ppm) - in the presence of and communicated to Tom Botham (Landfill Gas Technician, Cory Environmental);
- HOLL18 had been installed but did not have a gas hat. A methane emission of 350,000 ppm was detected at the top of the exposed pipework of HOLL18 - in the presence of and communicated to Tom Botham;
- Existing well HOLL3 was found to be damaged. The plastic lid was seen to have torn and the pipe was sticking out of the top of the steel casing (see Figure 1 below). A methane emission of 200,000 ppm was detected emanating from the top of the exposed pipe. James McClymont was told by Tom Botham that this had happened today (27th September), and that the well would be repaired with a new steel gas hat today;
- Due to the extensive working face a low point in the waste was noted between Cell 3 and Cell 4 (see Figure 2 below). Tom Botham stated that the low point was required for access to KOP6, for removal. James McClymont advised Tom Botham that this low point should be filled as soon as possible because gas may accumulate in this area. This could lead to odour emissions and the accumulation of noxious gas such as hydrogen sulphide. There is evidence of high hydrogen sulphide in some wells on site so this should have been prioritised and is considered poor working practise.

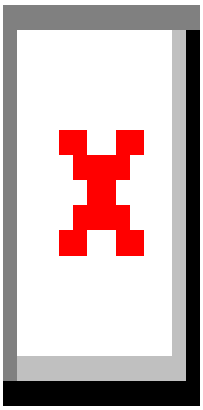

Figure 1: Damage to HOLL3 (27.09.2017)

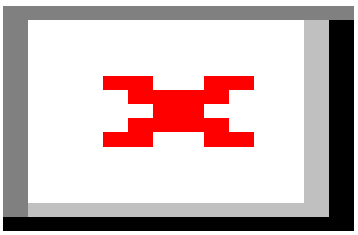

Figure 2: Low point in waste between Cell 3 & Cell 4 (27.09.2017)

28th September 2017 (11:20 - 13:00)

- A total of 7 new non-standard wells had been installed in Cell 4 - HOLL7, HOLL8, HOLL13, HOLL14, HOLL16, HOLL17 & HOLL18. All wells had received a steel gas hat, but none were connected to the gas extraction system;
- Methane emissions were detected at the bases of all new non-standard wells, with significant emissions detected at the bases of HOLL13 (58,000 ppm), HOLL16 (95,000 ppm), HOLL18 (120,000 ppm), HOLL7 (360,000 ppm) & HOLL8 (480,000 ppm) (full results attached) - in the presence of and communicated to Ian Craven (NW Area Manager, Cory Environmental);
- HOLL10 had been installed but did not have a gas hat. A methane emission of 24,000 ppm was detected at the top of the exposed pipework of HOLL10;
- Landfill gas readings were taken at all of the new wells using a GA2000+ Gas Analyser (full results attached) - in the presence of and communicated to Ian Craven. In summary, these results indicated rich landfill gas in all new wells, with carbon monoxide concentrations ranging between 11 ppm and 206 ppm, and hydrogen sulphide concentrations ranging between 26 ppm and 396 ppm. Due to the nature of cross interference the Operator has been independently testing carbon monoxide readings to ensure that a heating event is not occurring within the waste;
- Clay, which had been used to form a drilling platform, had been applied to the bases of some of the new non-standard wells, in a retrospective attempt to create a seal. Ian Craven said that they would be applying clay to the bases of all non-standard wells next week (w/c 2th October 2017), and that all wells should be connected to the gas extraction system by the end of the week (by 6th October 2017);
- HOLL3 had not been repaired (see Figure 3 below). A methane emission of 110,000 ppm was detected at the top of the exposed pipework. On the 27th of September, Tom Botham told James McClymont that this well would be repaired on the 27th of September. On the 28th of September, Ian Craven told James McClymont that this well would now be repaired on the 28th September, and that he would e-mail a photograph to confirm. This photo was received by James McClymont at 17:02 on the 28th of September (see Figure 4 below);
- The low point in the waste between Cell 3 and Cell 4 was still present. Ian Craven told James McClymont that this would be filled on Monday (2nd October) or Tuesday (3rd October) next week, once KOP6 had been removed. This meant that the low point would have been in place for at least five days, which is considered poor working practise.

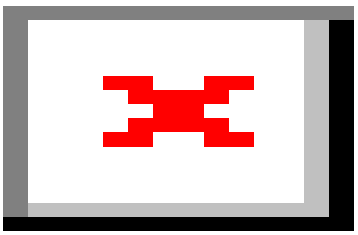

Figure 3: HOLL3 during site visit, not repaired (28.09.2017)

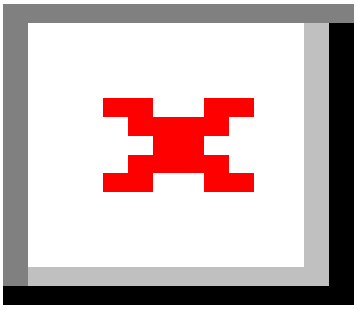

Figure 4: HOLL3 following site visit, with new gas hat (28.09.2017)

4th October 2017 (10:00 - 12:00)

- A total of 11 new non-standard wells had been installed in Cell 4 - HOLL7, HOLL8, HOLL9, HOLL10, HOLL11, HOLL13, HOLL14, HOLL15, HOLL16, HOLL17 & HOLL18. All wells had received a steel gas hat, but none were connected to the gas extraction system;
- Methane emissions were detected at the bases of all new non-standard wells (except HOLL10), with significant emissions detected at the bases of HOLL18 (2000 ppm), HOLL7 (25,000 ppm), HOLL16 (38,000 ppm), HOLL8 (78,000 ppm), HOLL15 (159,000 ppm), HOLL13 (200,000 ppm), HOLL17 (240,000 ppm) and HOLL14 (459,000 ppm) (full results attached) - in the presence of and communicated to Tom Botham;
- A methane emission of 100,000 ppm was detected at the base of existing well HOLL1, which was connected to the gas extraction system - in the presence of and communicated to Tom Botham;
- A methane emission of 290,000 ppm was detected at the base of existing well HOLL3, which was detected to the gas extraction system - in the presence of and communicated to Tom Botham;
- Ian Craven told James McClymont that all new non-standard wells would receive clay around their base in a retrospective attempt to seal today (4th October) or tomorrow (5th October), but that the wells would not all be connected to the gas extraction system until the end of the w/c 9th of October;

- The low point in the waste between Cell 3 and Cell 4 had been filled.

On the 11th of October, James McClymont e-mailed Graham Ball outlining that significant methane emissions had been detected at the bases of some of the new non-standard wells during the site visit on the 4th of October 2017. James McClymont pointed out that these wells were all installed by the 29th of September 2017, and if they were to be connected to the extraction system by the middle of the next week (w/c 16th October 2017), this meant that some of them would have been in-situ with no extraction for almost 3 weeks, potentially releasing significant concentrations of methane at their bases.

On the 20th of October, Ian Craven e-mailed James McClymont confirming that all of the non-standard gas wells were now connected to the gas extraction system and were being progressively balanced into the system.

As evidenced above, many of the non-standard gas wells were left unconnected to the gas extraction system for up to three weeks. A further site audit was undertaken following the connection of the non-standard wells to the gas extraction system, on the 1st of November 2017.

1st November 2017 (09:30 - 11:30)

- A total of 11 new non-standard wells had been installed in Cell 4 - HOLL4, HOLL5, HOLL7, HOLL8, HOLL9, HOLL10, HOLL11, HOLL13, HOLL14, HOLL15, HOLL16, HOLL17 & HOLL18. All wells had received a steel gas hat, and all were now connected to the gas extraction system;
- Methane emissions were detected at the bases of all new non-standard wells, with significant emissions detected at the bases of HOLL11 (2000 ppm), HOLL17 (83,000 ppm), HOLL9 (93,000 ppm), HOLL10 (144,000 ppm) and HOLL18 (234,000 ppm) (full results attached) - in the presence of and communicated to Ian Craven and Graham Ball;
- A methane emission of 29,000 ppm was detected at the base of existing well HOLL2, which was connected to the gas extraction system - in the presence of and communicated to Ian Craven and Graham Ball.

Compliance Summary

<u>New Non-Standard Gas Wells</u>

Fugitive emissions of substances

Permit condition 3.3.1 states that fugitive emissions of substances (excluding odour, noise and vibration) shall not cause pollution. The operator shall not be taken to have breached this condition if appropriate measures have been taken to prevent or where that is not practicable, to minimise, those emissions.

Five site audits were undertaken in order to assess the new non-standard wells. Significant methane emissions were detected at the bases of several of the new non-standard gas wells during the audits undertaken on the 27th September, 28th September, 4th October and 1st of November 2017. These emissions were detected in the presence of, and communicated to, Cory Environmental staff during each audit. Significant methane emissions were detected before and after the new non-standard wells were connected to the gas extraction system, and following retrospective attempts to seal with clay. Methane is a highly potent greenhouse gas having between 21 and 25 times greater global warming potential effect that that of carbon dioxide. The reduction of greenhouse gas emissions is a key requirement in the UK Climate Change Strategy.

Many of the new non-standard wells were left unconnected to the gas extraction system for at least 2 weeks, in some cases up to 3 weeks, meaning that landfill gas was not adequately controlled for

a significant period.

The above is deemed a breach of condition 3.3.1 and has been scored a Category 2 breach of the permit requirement.

Action 1: All new non-standard gas wells should be adequately sealed to minimise methane emissions as soon as practicable. The gas wells will be audited again to assess the effectiveness of their current seals to the waste mass and the efficacy of extraction.

Action 2: Provide NRW with an explanation as to why some of the new non-standard wells were not connected to the gas extraction system for 3 weeks, by the 31st of January 2018.

Engineering

Permit condition 2.7.4 states that 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 the Agency (NRW) has confirmed that it is satisfied with the construction proposals.

The Operator submitted to NRW a CQA plan outlining the design of the new non-standard wells. The Operator was informed of our concerns regarding the design of the new non-standard wells a month prior to their installation, in CAR_NRW0032063, and again in an e-mail from James McClymont to Graham Ball two weeks prior to their installation. The Operator confirmed that they had noted the content of CAR_NRW0032063, but took the decision to install the new non-standard wells against our advice.

The decision to install the new non-standard wells before NRW had confirmed that we were satisfied with the proposals is considered to be the root cause of the significant methane emissions detected during the audits on the 27th of September, 28th of September, 4th of October and the 1st of November.

The above is deemed a breach of condition 2.7.4 and has been scored a Category 3 breach of the permit requirement.

<u>Damage to HOLL3</u>

Fugitive emissions of substances

Permit condition 3.3.1 states that fugitive emissions of substances (excluding odour, noise and vibration) shall not cause pollution. The operator shall not be taken to have breached this condition if appropriate measures have been taken to prevent or where that is not practicable, to minimise, those emissions.

Significant methane emissions were detected at top of the damaged gas well HOLL3 on the 27th of September and the 28th of September.

The above is deemed a breach of condition 3.3.1 and has been scored a Category 3 breach of the permit requirement. Consolidated into the Category 2 breach of this condition.

General Management

Permit condition 1.1.1 states that activities should be managed and operated in accordance with a management system, which identifies and minimises risk of pollution, including those arising from operations, maintenance, accidents, incidents and non-conformances and those drawn to the attention of the operator as a result of complaints; and by sufficient persons who are competent in

respect of the responsibilities to be undertaken by them in connection with the operation of activities.

The damage to gas well HOLL3 was observed by the Operator and NRW on the 27th of September 2017. Gas well HOLL3 was left unrepaired for at least 24 hours, allowing significant landfill gas emissions.

The above is deemed a breach of condition 1.1.1 and has been scored a Category 3 breach of the permit requirement.

Action 3: Provide NRW with an explanation as to how the damage to gas well HOLL3 occurred, and why it was left for 24 hours before repair, by the 31st of January 2018.

Cyfoeth Naturiol Cymru Natural Resources Wales	**EPR Compliance Assessment Report**	**Report ID: CAR_NRW0032390**

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

Site	Hafod Quarry Landfill	Permit Ref	PP3139GB
Operator/Permit holder	Cory Environmental (Central) Ltd	Date	01/11/2017

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			
C2	C3	See comments section	31/01/2018
B1	C3	See comments section	31/01/2018
E1	C2	See comments section	31/01/2018

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.