Compliance Assessment Report CAR_NRW0039283

Permit being assessed: BU8819IV.
For: Pwllfawatkin Landfill Site EPR/BU8819IV, held by FCC Waste Services (UK) Limited
At: Pwllfawatkin Landfill Site , Pontardawe, SWANSEA, West Glamorgan, SA8 4RX.

Type of assessment carried out: Audit, Reason: Routine.
On 25/01/2022 between 12:30 and 16:00.
Parts of permit assessed: 1.1.1 a, 2.3.1 table S1.2 Operating Techniques

NRW Lead Officer: Ffion Thomas, accompanied by Tyrone Ward.
Report sent to: Richard Thomas, Site Manager on 04/02/2022.

1. Summary of our findings (full details in section 4)

Part of permitted activity assessed (criteria)	Assessment result	Permit condition
A1 - Specified by permit	Action only (X)	

Result types are explained in more detail in the 'Important Information' section below.

Total number of non-compliances recorded	Total non-compliance score
0	0

How we use the non-compliance score to calculate your annual fee is explained in the 'Important Information' section below.

2. What action is required?

Criteria	Action needed	Complete by
A1	Top 8 Points/Actions: 1. Undertake permanent capping of South West side wall flank (due Feb/March) 2. Dip all wells, (due Feb) Review and assess options if practicable to pump / dewater to increase the availability of slotted area. We agreed this would be looked at on a trial basis in selected wells following the survey. 3. Future projects, Review gas field coverage. Consider additional scavenger lines and new wells in areas of poor coverage 4. Future projects – Review functionality/serviceability of older wells (cells 1-2) redrilling where required to ensure coverage and maximise gas extraction. 5. Recommend remove PIN05 as not extracting. Redrill during final capping of site. 6. Share findings of investigation bag samples. 7. Continue FCC/Infinis weekly action plan meetings. 8. Suggest reviewing waste acceptance procedure of	31/03/2022

Criteria	Action needed	Complete by
	trommel fines. GUP Actions: 1. Investigate flow sensor accuracy, possibly needing calibration or review of position. 2. Repair required- air leak was found at 1 solenoid on the flare inlet pipe 3. Test louvres auto adjust system.	

Action criteria codes are listed in the 'Important information' section below.

3. What will happen next?

Any non-compliance we have identified and recorded on this form is an offence. It can result in criminal prosecution and/or suspension or revocation of your permit.

At this time, we do not intend to take any further action.

This statement does not stop us from taking additional enforcement action if further relevant information comes to light or offences continue.

4. Details of our assessment

Pwllfawatkin Landfill Gas Technical Review 25th Jan 2022 visit

Attendance

- Tyrone Ward, Ffion Thomas (NRW)
- Richard Thomas (FCC) George Augood and Lydon Crew (Infinis)

Purpose of the visit

The visit was undertaken as a follow up to previous gas management plan review and to aid in root cause analysis of recent odour complaints.
The visit was a targeted inspection starting at the Gas Utilisation plant, and then moved out to the gas field on the phase 2 landfill. NRA staff were accompanied by FCC site manager and Infinis contractors throughout the visit. Findings are presented below.

Gas Utilisation Plant inspection

Inlet

We took gas readings at the 450mm inlet main to the GUP using Infinis GA5000+ analyser, the results are reported below:

	Inlet to GUP
Pressure	-21.3mb
Methane	37.5%
Carbon Dioxide	30.1%
Oxygen	1.7
Balance	30
Hydrogen Sulphide	>>>
Carbon Monoxide	17

Note: >>> above instrument detection, reading over 1,000ppm

Engine (1 operational)

We took the readings from their *SCADA* system at around 13:55pm and discussed utilisation with Infinis contractors:

- 1Mw engine on-line and flare slightly open at ~5%
- Gas Flow to the GUP was 650 m^2/hr
- Suction 24mb
- 600-650 m^2/hr to engine and 414 m^2/hr to flare
- Generating 1025kW of electricity
- All cylinders averaging exhaust temperatures at ~603°C
- Gas type 1-2 50%

During the inspection a very slight yellow haze was visible to the engine exhaust, indicative of nitrogen oxides.

Flare

We took the readings from their *SCADA* system at around 13:50pm and discussed operation with Infinis contractors.

- Flare temp 572°C
- Flow to flare 414 m^2/hr
- Open 5%
- 2 burner bars, 1 inlet smaller than other

Observation:

A slight air leak was identified by Infinis at one of the flare slam shut valve solenoids. Infinis stated a repair will be made and this should be carried out as soon as practicable.

There appeared to be inaccuracy in the flow readings not reflecting reality. Please also arrange for the louvres to be tested to confirm the automatic adjustment system is working correctly to achieve optimum combustion temperature.

Monitoring ports have previously been installed and from review of previous audits suggests they are placed either side of the flare's flame arrestor.

Other observations:

1 blower and 1 backup. 2 Compressors on site,1 running 1 as back up. The compressor is only used to run the GUP, gas field knock out pots are operating on electrical pumping system.

FCC and Infinis attend weekly meetings were the sites "action plan" is reviewed. These meetings have greatly improved shared awareness and communication at the site e.g., better programme management of engineering works, mitigating of potential odour impacts, along with proactive gas management planning. NRW support this approach and are grateful for being kept updated.

GUP Actions:

1. Investigate flow sensor accuracy, possibly needing calibration or review of position.
2. Repair required- air leak was found at 1 solenoid on the flare inlet pipe
3. Test louvres auto adjust system.

Gas field inspection

We did not inspect the phase 1 area as part of this visit.

We undertook a visual inspection of the gas collection infrastructure on Phase 2 site and Infinis assisted with taking readings using GA5000+ analyser from wells that NRW had identified through data trends of high H2S. See table below and photo album.
A calibrated Gazomat TDL 500 methane analyser was also used and operated by Tyrone Ward of NRW throughout the site walkover. Points of interest/elevated readings are tabulated below. Calibration certificate added below:

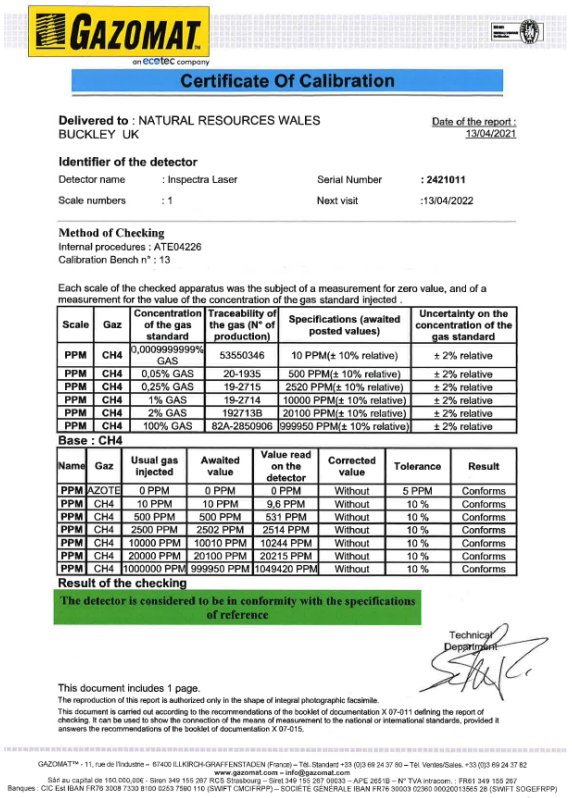
Gazomat Field Readings taken at operational landfill phase 2

Monitor ID	Date Taken	H2S ppm	Comments
Sidewall SW corner	25/01/2022	120 in locality	South west corner sidewall with haul road. Gas fluxing through cap regulation layer. 0.2% volume methane Odour detected.
Top of sidewall SW corner to tipping face	25/01/2022	62 ambient	Top of sidewall transect across to Eastern flank. Temp cap cover and colliery shale reg layer. Very small active tipping face.
Transect East flank cell 4 to top cell 2	25/01/2022	<5ppm	Transect from LR1/LR2 to L3SB Eastern flank final capped.
Transect down haul road East flank	25/01/2022	At top 3 Top mid 50 Low mid100 At bottom 2	Odour observed halfway up haul road. Believe gas fluxing from sidewall South west corner and NE wind resulting in gas ponding on haul road mid-way point prior to haul road incline increase.

Extraction Wells GA5000+ Readings and Comments

Monitor ID	Date Taken	CH4 %	CO2 %	O2 %	Balance	Diff mBar	CO ppm	H2S ppm	Comments
PWLZ20101	25/01/2022	34.1	30.4	1.1	34.4	-0,20	13	17	South East sidewall flank with base.
PWLZ20103	25/01/2022	20.9	23.8	3.3	52.1	-16.79	18	>>>	Side wall mid-point. >>>= Over 1,000ppm H2S
W1802	25/01/2022	37.3	36.1	0.8	25.8	-10.11	40	>>>	South West >>>= Over 1,000ppm H2S
W1807	25/01/2022	46.3	33.1	0.1	20.6	-17.13	10	165	South East sidewall/cell 4

Calibration certificate:



GAZOMAT
an ecotec company

Certificate Of Calibration

Delivered to : NATURAL RESOURCES WALES
BUCKLEY UK

Date of the report : 13/04/2021

Identifier of the detector

Detector name : Inspectra Laser
Serial Number : **2421011**
Scale numbers : 1
Next visit :13/04/2022

Method of Checking
Internal procedures : ATE04226
Calibration Bench n° : 13

Each scale of the checked apparatus was the subject of a measurement for zero value, and of a measurement for the value of the concentration of the gas standard injected .

Scale	Gaz	Concentration of the gas standard	Traceability of the gas (N° of production)	Specifications (awaited posted values)	Uncertainty on the concentration of the gas standard
PPM	CH4	0,0009999999% GAS	53550346	10 PPM(± 10% relative)	± 2% relative
PPM	CH4	0,05% GAS	20-1935	500 PPM(± 10% relative)	± 2% relative
PPM	CH4	0,25% GAS	19-2715	2520 PPM(± 10% relative)	± 2% relative
PPM	CH4	1% GAS	19-2714	10000 PPM(± 10% relative)	± 2% relative
PPM	CH4	2% GAS	192713B	20100 PPM(± 10% relative)	± 2% relative
PPM	CH4	100% GAS	82A-2850906	999950 PPM(± 10% relative)	± 2% relative

Base : CH4

Name	Gaz	Usual gas injected	Awaited value	Value read on the detector	Corrected value	Tolerance	Result
PPM	AZOTE	0 PPM	0 PPM	0 PPM	Without	5 PPM	Conforms
PPM	CH4	10 PPM	10 PPM	9,6 PPM	Without	10 %	Conforms
PPM	CH4	500 PPM	500 PPM	531 PPM	Without	10 %	Conforms
PPM	CH4	2500 PPM	2502 PPM	2514 PPM	Without	10 %	Conforms
PPM	CH4	10000 PPM	10010 PPM	10244 PPM	Without	10 %	Conforms
PPM	CH4	20000 PPM	20100 PPM	20215 PPM	Without	10 %	Conforms
PPM	CH4	1000000 PPM	999950 PPM	1049420 PPM	Without	10 %	Conforms

Result of the checking

The detector is considered to be in conformity with the specifications of reference

Technical Department

This document includes 1 page.
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This document is carried out according to the recommendations of the booklet of documentation X 07-011 defining the report of checking. It can be used to show the connection of the means of measurement to the national or international standards, provided it answers the recommendations of the booklet of documentation X 07-015.

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General observations:

- Updated GRA has previously been requested with FCC. Confirmation given an updated model is being drafted. NRW can offer comparison data and model assumption review.
- Some parts of the site have limited well coverage, specifically flank areas. Future projects need to review gas field well distribution/coverage to ensure recommended 40m spacing and review current well serviceability/functionality.
- FCC/Infinis need to consider how the site will be managed for retro drilling wells on steep slopes to ensure safe access for the drilling rig
- High H2S and odour observed at the south west corner and again on the haul road. Gas is fluxing through the regulation layer. FCC confirmed this area is due permanent capping in Feb/March.
- Scavenger lines are in place across the top of cell 4, near current tipping face. Infinis plan to put additional scavenger lines in as tipping progresses to prevent potential ballooning of temp cap.
- No ballooning of geomembrane cap seen, indicating, adequate collection but high H2S requires continued focused gas management.
- Daily cover consists of site won colliery shale, waste bottom ash and trommel fines as availability allows. On random examination the shale also contains a clay / micaceous content. Daily cover that is not stripped off and/or subjected to compaction can create a lamination effect which may result in perching due to reduced permeabilities. This requires close gas management to mitigate potential lateral gas migration routes.
- There is anecdotal evidence within the waste industry that waste fines from Waste transfer stations have the potential to contain gypsum particles. Gypsum is a banned waste from biodegradable waste landfills, due to its high sulphur content and potential H2S production. Waste producers are required to segregate

plaster/gypsum waste prior to landfilling. Suggest reviewing waste acceptance of trommel fines.

- The gas wells do not have pumps to dewater. Dipping is critical to assess functionality and serviceability. Infinis confirmed dipping of levels is due in February 2022. Following dipping practicable options can be made, assessing which wells would benefit from pumping to dewater and any retro drilling requirements.
- Older wells on Cells 1-4 need review of their functionality as not all are extracting (possible blinding of casing) and some wells have moved and / or damaged due to waste settlement and siltation. Dipping wells will aid in assessment of their functionality. Practicable options can then be made where required. We noted that whilst 90%+ of wells were open, there was no audible flow.
- The gas well to cap boot detail includes bentonite seals. No leaks noted at the wells visited.
- Pipe falls- Infinis engineer the pipe placement and use natural contours to limit low points that could increase condensate.
- PIN05 (cell 2) is showing signs of waste movement, with the well not positioned vertically, this has resulted in the associated collection pipework now being at a 90-degree angle, which would result in gas flow limitations. Infinis to consider retro drilling and/or relaying pipework when the final capping in this area is undertaken.
- Infinis are on site weekly, during which falls are checked and dewatering of knockout pots undertaken as required.
- Leachate wells are combined with gas extraction.
- Leachate riser LR1 and LR2 checked and found Sealed. No issues identified.
- There are 7 knockout pots at the whole site. 3 at Phase 2. Phase 2 does not have a completed ring main, with the south east corner yet to reach final contour/provides haul road access.
- Monitoring is undertaken monthly (permit requirement)

Top 8 Points/Actions:

1. Undertake permanent capping of South West side wall flank (due Feb/March)
2. Dip all wells, (due Feb) Review and assess options if practicable to pump / dewater to increase the availability of slotted area. We agreed this would be looked at on a trial basis in selected wells following the survey.
3. Future projects, Review gas field coverage. Consider additional scavenger lines and new wells in areas of poor coverage
4. Future projects – Review functionality/serviceability of older wells (cells 1-2) redrilling where required to ensure coverage and maximise gas extraction.
5. Recommend remove PIN05 as not extracting. Redrill during final capping of site.
6. Share findings of investigation bag samples.
7. Continue FCC/Infinis weekly action plan meetings.
8. Suggest reviewing waste acceptance procedure of trommel fines.

Other relevant comments/observations during the visit.
Whilst on site discussions included the steep gradient of the sidewall, and that revisited final profile levels have been proposed under planning application.
NRW are aware that FCC are applying to planners for extension of operational timeframe and changes to final waste profiles.
Any changes to the final landform and their implications on infrastructure provision and maintenance will need to be approved and reflected in the site EPR permit.

FCC have previously been encouraged to submit an EPR variation application and now as a matter of urgency so that changes can be considered. NRW are unable to pre-determine the outcome of this permit application and cannot therefore provide comment on the proposed revised landform at this stage.

Some of the key issues FCC need to address as part of the EPR permit application is whether any changes in the gradients would affect the stability of the landfill's capping and restoration infrastructure (i.e. particularly on the interfaces between the various geosynthetic and other layers that form the cap). FCC will also need to demonstrate that the revised landform would not affect the integrity of the underlying basal lining system in each landfill cell. The design of the basal lining system in each cell was based on an expected loading from the overlying waste and soil layers, which in turn was derived from the original landform approved in the current EPR permit. Any changes to the landform could therefore impact the basal lining systems, which provide containment to the waste and landfill leachates. FCC will therefore need to demonstrate, as part of their EPR permit application, that the proposed changes in landform would be within the design parameters of the basal lining system built for each cell. If the changes in waste profiles are greater than the design parameters of the basal lining system in the underlying cell, then NRW are unlikely to accept the proposed landform.
As part of the EPR variation application FCC would also need to provide details on how landfill infrastructure will be maintained during the long aftercare period, specifically the practicalities of drilling replacement leachate/landfill gas wells on steep slopes. Furthermore, there is also the practicalities of accessing the infrastructure routinely on steep flanks e.g. access roads etc.

END.

If you have any queries about this report, or to discuss completion of any actions, please contact the NRW Officer named above.

Important information

Legal status of this report

Your permit is issued to you under the Environmental Permitting Regulations. You have a responsibility to comply with the conditions of your permit and prevent pollution/harm of the environment. You must also ensure that you comply with any other relevant legislation that may apply to your site's operations.

This report explains the findings of our assessment and any action you are required to take. We categorise non-compliance using our guidance for assessing non-compliance at regulated sites.

When we find potential non-compliance/s we will normally give you advice on how to maintain compliance.

To correct non-compliance, we may:

- require you to take specific actions
- issue a notice
- review the conditions of your permit.

Any advice and guidance we give will be without prejudice to any other enforcement response that we consider may be required.

Assessment results and non-compliance categories (used in section 1):

Assessment result	Description
Assessed (A)	Assessed or assessed in part, no evidence of non-compliance found
Action only (X)	Action only relating to the activity assessment
Ongoing (O)	Ongoing non-compliance, not scored

Non-compliance category	Description	Score
C1 Major	Potential to have a major, serious, persistent and/or extensive impact or effect on the environment, people and/or property	60
C2 Significant	Potential to have a significant impact or effect on the environment, people and/or property	31
C3 Minor	Potential to have a minor or minimal impact or effect on the environment, people and/or property	4
C4 No environmental impact	Non-compliance at a regulated site that cannot foreseeably have any impact on the environment, people and/or property	0.1

How we use assessment scores

The number and severity of non-compliances recorded in a year will affect your annual subsistence fee the following year. A non-compliance factor is added to your site's Operator

Performance Risk Appraisal (OPRA) score when we calculate your fee to reflect the additional resource we use to assess permit compliance.

What are suspended scores?
In line with our guidance, we may suspend scores for up to six months to allow time for remedial action to be taken. Suspended scores will be re-instated if the action is not completed.

Full list of Industry and Waste action criteria (used in section 1 and 2):

A: Permitted activities
- A1 Specified by permit

B: Infrastructure
- B1 Infrastructure – Engineering for prevention and control of emissions
- B2 Infrastructure – Closure and decommissioning
- B3 Infrastructure – Site drainage engineering (clean and foul)
- B4 Infrastructure – Containment of stored materials
- B5 Infrastructure – Plant and equipment

C: General management
- C1 General management – Staff competency/training
- C2 General management – Management system and operating procedures
- C3 General management – Materials acceptance
- C4 General management – Storage, handling, labelling and segregation

D: Incident management
- D1 Incident management – Site security
- D2 Incident management – Accidents, emergency and incident planning

E: Emissions
- E1 Emissions – Air
- E2 Emissions – Land and groundwater
- E3 Emissions – Surface water
- E4 Emissions – Sewer
- E5 Emissions – Waste

F: Amenity
- F1 Amenity – Odour
- F2 Amenity – Noise
- F3 Amenity – Dust/fibres/particulates and litter
- F4 Amenity – Pests/birds and scavengers
- F5 Amenity – Deposits on road

G: Monitoring and records, maintenance and reporting
- G1 Monitoring and records, maintenance and reporting – Monitoring of emissions and environment
- G2 Monitoring and records, maintenance and reporting – Records of activity, site diary/journal/events
- G3 Monitoring and records, maintenance and reporting – Maintenance records
- G4 Monitoring and records, maintenance and reporting – Reporting and notification to Natural Resources Wales

H: Resources efficiency
- H1 Resource efficiency – Efficient use of raw materials
- H2 Resource efficiency – Energy efficiency

Enforcement response
Any permit condition non-compliance is an offence and we may take legal action against you. Action we take can include prosecution, serving a notice on you and/or suspension or revocation of your permit. See our Enforcement and Sanctions Guidance for further information.

Data protection notice
You should make sure that anyone named in this report knows that the information it contains will be processed by Natural Resources Wales to fulfil its regulatory and monitoring functions and to maintain the relevant public register(s).

We may also use and/or disclose the report in connection with:

- offering or providing you with our literature or services relating to environmental matters
- consulting with the public, public bodies and other organisations (e.g. 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 our service
- Freedom of Information Act or Environmental Information Regulations requests.

We may also pass it on to our agents or representatives to do these things on our behalf.

Disclosure of information – this report will be available to view on-line
If you think this report contains commercially confidential information that should not be placed on our public register, you must contact your local Natural Resources Wales office within **fifteen working days** of receiving this report, using the contact details in the accompanying email or letter. You must give a full explanation of why it should not be added to our public register, including specifying which information is commercially confidential. We will assess your request and respond to you within 20 working days to let you know if we agree to your request.

What do I do if I disagree with the report or have a complaint?
If you disagree with this compliance assessment report, you should contact the lead officer without delay to discuss your concerns.

If you are unable to resolve the issue with the lead officer or their line manager you should contact our Customer Contact team on 0300 065 3000 (Monday to Friday 08:00 – 18:00), or email enquiries@naturalresourceswales.gov.uk for details of how to raise your dispute further through our Complaints and Commendations procedure.

If you are dissatisfied with our response, you can contact the Public Services Ombudsman for Wales by phone on 0300 7900203 or by email at ask@ombudsman.wales

Welsh Language Standards
We are committed to establishing Natural Resources Wales as a naturally bilingual organisation. We will provide compliance reports in your preferred language.