Natural Resources Wales Technical Review Of Landfill Gas Management Systems

Hafod Landfill Gas Review, 25th May 2017

Permit No: PP3139GB

Note: Summary of findings and actions sent by e-mail (26th May 2017, 16:56)

Introduction

Following a site meeting at 09:30 between Ian Craven (NW Area Manager) and Graham Ball (Head of Landfill Gas) of Cory Environmental and Jim McClymont (Regulatory Officer), Tony Roberts (Landfill Gas Technical Specialist), Aled Zachary (Regulatory Officer) and Paul Challender (Environment Officer) of Natural Resources Wales, where the plan for conducting the audit and previous audit actions and follow ups were discussed, the site was audited using a Gazomat Methane Detector for emissions detection and a GA2000+ analyser for measuring gases within the gas management infrastructure.

The audit focussed on Cells 3 and 4.

Main Findings

Note: A summary of the main initial findings was forwarded for action on the 26th of May 2017, one day after the audit took place.

1. The vacuum applied to the field appears to be high. This can lead to over suction in the field and difficulties with accurate and responsive field balancing. Over suction can result in a spiral of extra demand and decreasing gas quality which can affect gas production and collection.

   ACTION: Investigate ways of balancing extraction pressure to ensure that engine demand and field pressure match the gas production and extraction parameters required for best practice control. Please provide a report of actions and outcomes by the 31st of July 2017.

2. The working face on the Eastern edge of Cell 4 was too high and presented an open cross sectional area which was not in keeping with operating at best practice. In addition the practice of tipping waste a significant distance from the working face and then pushing the waste to the eventual deposit area has created a very large operational area with little cover and high emissions.

   ACTION: The working face must be reduced in area and height and the uncovered waste should be covered to the greatest extent. Please provide a report of actions and outcomes by the 31st of July 2017.

3. Of the 9 pin wells that were installed at the base of Cell 4 only one has any flow (which is minimal). Due to the issues with operations (see point 2 above) the three leachate wells were disconnected from the gas extraction system causing high emissions and some odour in places. This means that the only gas extraction in this area was from the 'Hollivator' designed wells which were not performing efficiently and one of these wells was switched off due to oxygen ingress.

   ACTION: This level of emission is unacceptable and all existing extraction infrastructure should be re-connected immediately. This should be followed by the submission of an action plan for the installation of new gas wells and associated pipe-work (including zones of influence). Please provide an action plan by the 31st of July 2017.

4. Odours were detected in various areas across Cell 4, along with high surface emissions from the Gazomat survey.

   ACTION: All measures should be taken to bring the site to best practice and reduce odour and gas emission as soon as possible. Please provide a report of actions and outcomes by the 31st of July 2017.

5. It was noted that there were numerous flies across the surface of Cell 4. These are the type of flies associated with landfill.

   ACTION: Take immediate measures to supress fly numbers on site, specifically in Cell 4. Please provide a report of actions and outcomes by the 31st of July 2017.

6. The gas extraction well table at the end of this report gives the readings and comments of issues that came to light during the audit.

   ACTION: Review the findings and undertake actions required in this table by the 31st of July 2017.

Extraction Wells GA2000+ Readings and Comments – Hafod Landfill 25/05/2017

Monitor ID	CH4 %	CO2 %	O2 %	Balance	Diff mBar	CO ppm	H2S ppm	Comments
Compound	44.6	32.5	1.0	21.9	-105	8	24	Sample taken at compound inlet before knockout pot, Pre-booster. ***ACTION: Investigate high suction pressure which may cause some difficulties in balancing the field***
HFOPNW22	67.6	25.6	0.8	5.9	-104	16	28	Pin well below the new waste in cell 4 – No Flow. ***ACTION: Improve gas extraction in this area***
HF00W031	58.4	39.6	0.2	1.8	-104	0	6	Pin well below the new waste in cell 4 – No Flow. ***ACTION: Improve gas extraction in this area***
FF0PNW21	62.7	35.3	0.2	1.7	-104	0	3	Pin well below the new waste in cell 4 – No Flow. ***ACTION: Improve gas extraction in this area***
LMP2	63.7	36.2	0.2	1.0	+312	0	2	LMP 2 had high gas emissions (See Gazomat survey) and very high positive pressure. ***ACTION: The dynamics between water level, pumping and gas extraction should be investigated as a matter of urgency. Gas pressure control should be maintained at a level that prevents such high positive pressure from building***
HFOPNW10	54.0	29.0	2.5	14.9	-101	0	2	This well showed a small differential between mains and well pressure, which indicates some flow. Audible inspection confirmed that there was very low flow from the well.
HFOPNW11	62.0	35.7	0.2	2.6	-104.6	0	2	Pin well below the new waste in cell 4 – No Flow. ***ACTION: Improve gas extraction in this area***
HFOPNW12	57.2	39.9	0.2	2.8	-105	0	2	Pin well below the new waste in cell 4 – No Flow. ***ACTION: Improve gas extraction in this area***
HFOPNW09	8.5	23.5	1.5	66.6	+13	7	3	Pin well below the new waste in cell 4 – No Flow. ***ACTION: Improve gas extraction in this area***
AF00W030	58.3	37.8	0.2	3.6	-104	0	4	Pin well below the new waste in cell 4 – No Flow. ***ACTION: Improve gas extraction in this area***

Fugitive Emissions Readings and Comments – Hafod Landfill 25/05/2017

Monitor ID	Time	CH_4 (PPM)	Comments
HF00W068	11:58	100,000	Gas Well on Cell 3, large emission from base. ***Action: Requires resealing or dewatering***
KOP5	12:04	750	No issues, watching brief.
HF00W065	12:06	30	No issues.
HF00W062	12:07	1500	Gas Well on Cell 3, emission from base. ***Action: Requires resealing or dewatering***
HF00W056	12:09	----------	No issues
HF00W061	12:13	5300	High emissions from well Base and no apparent flow "NAF" ***Action: Requires resealing or dewatering***
HFOPNW59	12:20	75,000	Gas Well on Cell 3, large emission from base. ***Action: Requires resealing or dewatering***
HFOPNW63	12:28	----------	No issues
HFOPNW64	12:30	64	Flow
Flank of cell 3	12:34	6000	Gas bubbling up through leachate ***ACTION: Further gas extraction required in the area***
HFOOW050	12:39	----------	No issues
LMP1	12:43	400,000	Leachate Monitoring Point, large emission and strong odour around this point. ***Action: Requires resealing and additional extraction***
HFOOW036	12:47	----------	No issues although NAF
LMP2A	12:49	50,000	Leachate Monitoring Point, large emission and strong odour around this point. ***Action: Requires resealing and additional extraction***
KOP6	12:52	----------	No issues
LMP2	12:53	4000	Leachate Monitoring Point, large emission and odour around this point. ***Action: Requires resealing and additional extraction***
HOLL3	13:57	60,000	"Hollivator" temporary well ***Action: Alternative gas collection infrastructure should be considered in this area***

Surface of Cell 4	13:59 – 14:01	60-800 (ambient)	Emissions from waste surface of Cell 4 over extended area adjacent to HOLL3 ***Action: Gas extraction in this area requires immediate improvement***
HFOOGW037	14:09	----------	
HFOOW051	14:12	----------	
HFOOGW037	14:13	----------	
HOLL2	14:18	10,000	"Hollivator" temporary well ***Action: Alternative gas collection infrastructure should be considered in this area***
HFLMP004	14:20	6000	Leachate Monitoring Point, large emission and odour around this point. ***Action: Requires resealing and additional extraction***
HOLL1	14:21	7000	"Hollivator" temporary well ***Action: Alternative gas collection infrastructure should be considered in this area***
LC4	14:23	600,000	Leachate Monitoring Point, large emission and very strong odour around this point. ***Action: Requires resealing and additional extraction***
Eastern Sidewall of Cell 4	14:27	40-60 (ambient)	Emissions from waste surface of Cell 4 over extended area adjacent to eastern sidewall ***Action: Gas extraction in this area requires immediate improvement***
HFLMP004A	14:32	490,000	Leachate Monitoring Point, large emission and very strong odour around this point. ***Action: Requires resealing and additional extraction***

Jim McClymont

Regulatory Officer, Industry Regulation

16/06/2017