From: Mawgan Naylor
Sent: 17 July 2018 11:47
To: 'Guy Titchmarsh' <guy@titchmarshandbagley.com>
Subject: RE: Gas Monitoring at Harrogate Road, Spofforth

Hello Guy,

I have completed two out of nine gas monitoring visits at Harrogate Road, Spofforth.

The current findings so far show slightly elevated concentrations of carbon dioxide in the north of the site, this is likely due to the degradation of wood found in shallow made ground in the north. There have been no elevated concentrations in the south where the site is adjacent to a landfill.

Current monitoring data suggests that no gas protection measures are required across the entire site. However, the landfill to the south of the site consists of household waste which can be highly variable in how it degrades. The amount of degradation can also change according to the groundwater regime. Therefore, it is highly likely that we will recommend some protection measures (Amber 1) in any plots along the southern boundary adjacent to the landfill.

Please note, that these findings are only from two visits, and may change after completion of the nine visits required.

If you need any more information, please get in touch.

Kind regards,

Mawgan.

From: Liz Hart [mailto:Liz.Hart@lithos.co.uk]
Sent: 29 August 2018 10:56
To: James Farnaby
Cc: Guy Titchmarsh
Subject: FW: Gas Monitoring at Harrogate Road, Spofforth

Dear James and Guy

Further to Mawgans email below we have now completed 4 of the 9 visits. There is little change in the gas regime with no methane and low concentrations of carbon dioxide in the north of the site. There is no evidence of gas migration from the adjacent landfill, however as Mawqan indicated in her email it would be prudent to allow for Amber 1 protection in plots 23 to 32 along the southern boundary as there is evidence that the landfill has produced gas and may continue to do so in the future.

Providing monitoring continues as it has to date, Amber 1 protection will be recommended in plots 23 – 32, no protection will be required for remaining plots across the wider site.

Amber 1 protection is summarised below;

Traffic light classificn and "score" req'd by BS8485#	Floor slab (BS8485 "score")	Protective measures	
		Sub-floor ventilation (BS8485 "score")	Membrane
			Type (BS8485 "score")
Amber 1 **3.5**	*Select one from:* i. Block & Beam – **(0)**. ii. Reinforced ground bearing slab – **(0.5)**. iii. Reinforced, cast in-situ suspended slab (with minimal and suitably sealed service penetrations & joints) – **(1.5)**. iv. Reinforced ground bearing raft (with limited service penetrations cast into slab). Note: the venting area through any downstand beam should be 3 times greater than that provided by the side ventilation (air bricks) – **(1.5)**.	*Select one from:* Passive sub-floor ventilation; venting layer could be: i. A min. 150mm clear void **(2.5)**, or ii. A proprietary void former providing an equivalent clear void depth of 60mm; see Section B7 in BS8485:2015 **(2.5)**, or iii. Min. 300mm thick blanket of min. 20mm single size gravel **(1.0)**. Min. ventilation = 1,500 mm^2/m run of external wall (via air bricks on each of 2 opposite sides), with 100mm pipes at 1.75m centres or honeycombing of any sub-floor sleeper walls.	Gas resistant membrane meeting all of the following criteria: · sufficiently impervious to gases with a methane gas transmission rate <40.0 ml/day/m^2/atm (average) for sheet and joints (tested in accordance with BS ISO 15105-1 manometric method); · sufficiently durable to remain serviceable for the anticipated life of the building and duration of gas emissions; · sufficiently strong to withstand in-service stresses (e.g. settlement if placed below a floor slab); · sufficiently strong to withstand the installation process and following trades until covered (e.g. penetration from steel fibres in fibre reinforced concrete, penetration of reinforcement ties, tearing due to working above it, dropping tools, etc); · capable, after installation, of providing a complete barrier to the entry of the relevant gas; and · a minimum 0.4 mm thickness (1600g polyethylene) reinforced membrane (virgin polymer) · verified in accordance with CIRIA C735∞ **(2.0)**

The gas monitoring is due to be completed in December. I will keep an eye on the data and if anything changes I will let you know.

Regards
Liz

Liz Hart
Lithos Consulting