

GLEESON STRATEGIC LAND / RYDON HOMES

Paul Slings / Elliott Newlyn
(By email)

22 August 2018

Subject: Land South of Water Lane, Angmering – Supplementary Ground Gas Risk Assessment
Our ref: L-19495-2.4.2-18-S455-LMH

Dear Sirs,

Further to your recent instruction I am pleased to present the results of three supplementary rounds of ground gas monitoring and an updated ground gas risk assessment for proposed residential development at the site to the south of Water Lane, Angmering.

Three rounds of ground gas monitoring were initially undertaken during September / October 2015 and were included together with a ground gas risk assessment in our Geo-environmental Assessment (ref: GEA-19495-16-306REVB) dated 3 May 2017. During the 2015 monitoring, positive flow was recorded to a maximum of 0.7 l.hr⁻¹, with a negligible steady flow. Over the three monitoring rounds methane (CH₄) was not detected, carbon dioxide (CO₂) was detected to a maximum of 7.0 % by volume (% v/v) (although the response zone was almost entirely submerged), with a corresponding depleted oxygen concentration of 13.6 % v/v. During the second visit when the hole was noted to be dry, carbon dioxide was recorded at 4.0 % v/v. Monitoring included a period of low atmospheric pressure at 981 mb.

The report noted that on the basis of the three initial monitoring rounds the site would be classified as 'green' using the NHBC classification scheme or 'characteristic situation 1'. However, given that carbon dioxide was recorded above 5% v/v on several occasions, basic gas protection measures were recommended ('Amber 1' for low rise housing with a sub-floor void, and 'characteristic situation 2' for all other development). In addition, the site lies within a Radon Affected Area as defined by the Health Protection Agency (between 5% and 10% of houses are above the action level). Guidance issued by the Buildings Research Establishment (BRE-211) indicates that basic protection measures are necessary.

In order to increase the dataset for ground gas risk assessment, three additional rounds of monitoring were undertaken during July and August 2018 from six wells spread across the site. The monitoring was undertaken from boreholes with installations in unsaturated natural ground responding from 1.0 – 9.0 m bgl. No peak or steady flows were detected and no methane was detected. Carbon dioxide was detected at low concentrations to a maximum of 2.5 %. Field monitoring records and a site plan are enclosed.

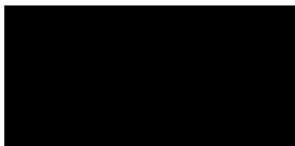
The new data does not change the original assessment. New dwellings at the site should be provided with 'Amber 1' protection (applicable to low rise houses with a ventilated subfloor void) or 'Characteristic Situation 2' protection applicable for all other types of property. This will also fulfil the requirements for basic radon protection.

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IDOM

I trust the above is sufficient for your purposes at this stage. Please do not hesitate to contact me should you required any further information.

Yours Sincerely



Dr Lisa Horsley



Legend

Southern parcel boundary

Merebrook cable percussion borehole installed for groundwater level monitoring

First issue	10-05-2017		-
	EMP	SJ	SJ
Issue Details	Dwn	Chd	App'd
Client/Project			
Rydon Homes & Gleeson Strategic Land			
Land South Of Water Lane, Angmering			
Dwg Title			
Approximate Borehole Locations			
Job No.	19495	Dwg No.	304-003
Scale	1:2500	Date	May 2017
Drawn	EMP	Checked	SJ
Revision		-	
Frame Dimensions mm		(A3) 400 x 280	
Approved		SJ	

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GAS MONITORING RECORD ROUND 1



Location Reference	Time	Flow and Pressure Measurements				Gas Measurements						VOC Measurements		Dip Measurements		Comments
		Flow		Atmospheric Pressure	Differential Pressure	Methane	Methane LEL	Carbon Dioxide	Oxygen	Carbon Monoxide	Hydrogen Sulphide	Hexane	PID	Depth to Water	Depth to Base	
		max	steady													
		l hr ⁻¹														
MBH01	09:12	0	0	1021	0	0	0	1.6	19.5	0	0	0.000	nr	10.04	9.57	Slightly milky water
MBH02	09:25	0	0	1021	0	0	0	1.5	19.5	0	0	0.000	nr	Dry	9.76	-
MBH03	08:56	0	0	1021	0	0	0	0.1	20.7	0	0	0.000	nr	Dry	9.90	-
MBH04	08:40	0	0	1022	0	0	0	1	20	0	0	0.000	nr	8.04	9.73	Light brown muddy water
MBH06	08:30	0	0	1022	0	0	0	0	20.7	0	0	0.000	nr	9.05	9.68	-
MBH07	08:18	0	0	1022	0	0	0	0.3	20.5	0	0	0.002	nr	Dry	8.28	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0	-	-	-	-	-	-	-	-	-	-	nr	-	nr	-	-	-
0	-	-	-	-	-	-	-	-	-	-	nr	-	nr	-	-	-
0	-	-	-	-	-	-	-	-	-	-	nr	-	nr	-	-	-
0	-	-	-	-	-	-	-	-	-	-	nr	-	nr	-	-	-
0	-	-	-	-	-	-	-	-	-	-	nr	-	nr	-	-	-
0	-	-	-	-	-	-	-	-	-	-	nr	-	nr	-	-	-
0	-	-	-	-	-	-	-	-	-	-	nr	-	nr	-	-	-
Weather:		Dry, sunny, warm				nr = not recorded			Gas Analyser		PID		Site:		Water Lane, Angmering	
						Model:			GFM 435		-		Project Number:		19495	
						Serial Number:			11839		-		Monitored By:		Steffani Whittaker	
						Date of Last Calibration:			30/05/2017		-		Date:		13/07/2018	

GAS MONITORING RECORD ROUND 2



Location Reference	Time	Flow and Pressure Measurements				Gas Measurements						VOC Measurements		Dip Measurements		Comments
		Flow		Atmospheric Pressure	Differential Pressure	Methane	Methane LEL	Carbon Dioxide	Oxygen	Carbon Monoxide	Hydrogen Sulphide	Hexane	PID	Depth to Water	Depth to Base	
		max	steady													
		l hr ⁻¹														
MBH01	-	0	0	1020	0	0	0	0.7	20.7	0	0	0.000	nr	9.52	9.58	-
MBH02	-	0	0	1020	0	0	0	0.4	20.9	0	0	0.000	nr	9.86	9.89	-
MBH03	-	0	0	1024	0	0	0	0	20.6	0	0	0.000	nr	Dry	9.94	-
MBH04	-	0	0	1021	0	0	0	0	20.5	0	0	0.000	nr	8.08	9.69	-
MBH06	-	0	0	1022	0	0	0	0	20.9	0	0	0.000	nr	9.09	9.78	-
MBH07	-	0	0	1023	0	0	0	0	20.7	0	0	0.000	nr	Dry	9.31	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0	-	-	-	-	-	-	-	-	-	-	nr	-	nr	-	-	-
0	-	-	-	-	-	-	-	-	-	-	nr	-	nr	-	-	-
0	-	-	-	-	-	-	-	-	-	-	nr	-	nr	-	-	-
0	-	-	-	-	-	-	-	-	-	-	nr	-	nr	-	-	-
0	-	-	-	-	-	-	-	-	-	-	nr	-	nr	-	-	-
0	-	-	-	-	-	-	-	-	-	-	nr	-	nr	-	-	-
0	-	-	-	-	-	-	-	-	-	-	nr	-	nr	-	-	-
Weather:		#REF!				nr = not recorded			Gas Analyser		PID		Site:		Water Lane, Angmering	
						Model:			GFM 436		-		Project Number:		19495	
						Serial Number:			12228		-		Monitored By:		#REF!	
						Date of Last Calibration:			01/05/2018		-		Date:		01/08/2018	

GAS MONITORING RECORD ROUND 3



Location Reference	Time	Flow and Pressure Measurements				Gas Measurements						VOC Measurements		Dip Measurements		Comments
		Flow		Atmospheric Pressure	Differential Pressure	Methane	Methane LEL	Carbon Dioxide	Oxygen	Carbon Monoxide	Hydrogen Sulphide	Hexane	PID	Depth to Water	Depth to Base	
		max	steady													
		l hr ⁻¹														
MBH01	11:20	0	0	1019	0	0	0	0.1	20.6	0	0	0.001	0	DRY	9.85	-
MBH02	11:25	0	0	1019	0	0	0	2	19.1	0	0	0.005	0	10.06	10.10	-
MBH03	10:35	0	0	1019	0	0	0	0.1	20.5	0	0	0.006	0	DRY	9.94	-
MBH04	10:50	0	0	1019	0	0	0	2.5	18.6	0	0	0.003	0	8.09	9.70	-
MBH06	10:45	0	0	1019	0	0	0	0.3	20.1	0	0	0.005	0	9.11	9.73	-
MBH07	11:10	0	0	1019	0	0	0	0.2	20.5	0	0	0.005	0	DRY	9.30	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0	-	-	-	-	-	-	-	-	-	-	nr	-	nr	-	-	-
0	-	-	-	-	-	-	-	-	-	-	nr	-	nr	-	-	-
0	-	-	-	-	-	-	-	-	-	-	nr	-	nr	-	-	-
0	-	-	-	-	-	-	-	-	-	-	nr	-	nr	-	-	-
0	-	-	-	-	-	-	-	-	-	-	nr	-	nr	-	-	-
0	-	-	-	-	-	-	-	-	-	-	nr	-	nr	-	-	-
0	-	-	-	-	-	-	-	-	-	-	nr	-	nr	-	-	-
0	-	-	-	-	-	-	-	-	-	-	nr	-	nr	-	-	-
Weather:		Sunny spells, warm				nr = not recorded			Gas Analyser		PID		Site:		Water Lane, Angmering	
						Model:			GFM 436		-		Project Number:		19495	
						Serial Number:			12667		-		Monitored By:		Alejandro Sanchez	
						Date of Last Calibration:			16/04/2018		-		Date:		21/08/2018	