Gas Assessment Addendum Report
102 Camley Street, Camden

Further to the issue of our geo-environmental report (ref. 20698p1r0) dated May 2014, please find below the gas and groundwater monitoring addendum letter report for the above site.

Subsequent to the intrusive ground investigation works carried out in April 2014, three land gas and groundwater monitoring visits were undertaken between the dates of 13th May 2014 and 27th May 2014. Groundwater monitoring was undertaken using an electronic dip meter to record the depth to groundwater and land gas monitoring carried out using a GFM.

Ground Gas Monitoring

Three ground gas monitoring visits were completed and concentrations of methane (CH_4), carbon dioxide (CO_2) and Oxygen (O_2) were measured using an infra-red gas analyser (GFM) calibrated to a reference standard (before and after each survey) and gas flow rates were measured using an internal flow pod.

Gas measurements were recorded for a minimum of sixty seconds at each location, at which point the maximum concentration of CH_4 and CO_2 together with the lowest concentration of O_2 were recorded.

Sources of Ground Gas

The Phase 1 Desk Top Study Report carried out by Arup in March 2014 (ref. Job number 601321-02) identified the Made Ground as a potential source of ground gas. As such monitoring installations were installed during the works in (WS103 and BH101) within the

Made Ground, albeit the installation within BH101 appeared to be damaged due to on-site activities at the beginning of May 2014 so could not be monitored.

Ground Gas Assessment
The potential impact on the development from ground gases has been assessed with reference to standards and guidelines published in CIRIA Report 665 (*Assessing risks posed by hazardous ground gases to buildings*, 2007). However, it is recommended that the protection measures are agreed with the local authority prior to their adoption on-site. Furthermore, all protection measures adopted should be validated by a suitably qualified engineer.

The results of the ground gas monitoring are presented in Table 1.0.

Table 1.0 Gas Monitoring Results

Well	Date	CH₄ Initial %v/v	CH₄ Steady %v/v	CH₄ GSV l/hr	CO₂ Initial %v/v	CO₂ Steady %v/v	CO₂ GSV l/hr	O₂ %v/v	Atmos (mb)	Atmos. Dynamic	Flow (l/hr)	Response Zone (mbgl)	Depth to Base (mbgl)	Depth to Water (mbgl)
	13/05/2014	0	0	0	0.7	0.7	-0.0042	19.6	1012	Steady	-0.60	-	3.37	3.07
WS103	20/05/2014	0	0	0	1.4	1.4	0	19.0	1002	Steady	0	-	3.35	3.02
	27/05/2014	0	0	0	2.3	2.3	0	17.7	1011	Steady	0	-	3.41	2.67
BH101	Hole damaged – unable to monitor this location.													

Ground Gas Assessment

The potential impact on the development from ground gases has been assessed with reference to standards and guidelines published in CIRIA Report 665 (*Assessing risks posed by hazardous ground gases to buildings*, 2007).

During the three monitoring visits completed over three weeks, no significantly elevated concentrations of methane were recorded within the installation. However, concentrations of carbon dioxide (up to 2.3% v/v) were recorded.

During the monitoring no significant flows were noted from the well.

In accordance with the methodology outlined within the CIRIA publication C665, REC have utilised the results of the ground gas monitoring surveys to calculate a tentative Gas Screening Value (GSV). The maximum GSV calculated for methane was 0 and for carbon dioxide was -0.0042 l/hr.
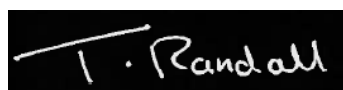
The GSV has been compared to the criteria outlined with CIRIA C665 to determine the level of risk to the proposed development and to ensure the appropriate remedial options are incorporated into any future building design in this area.

CIRIA C665 states that the maximum GSV for carbon dioxide and methane is <0.07 l/hr for Characteristic Situation 1 and the GSVs for this site fall into this bracket. It is therefore recommended that Characteristic Situation 1 is used.

Based on the limited data set, the results suggest that no gas protection measures are required to be incorporated into new structures. However, consideration may need to be given for the installation of additional monitoring wells on site at a later stage in order to confirm these findings and to expand the dataset.

Yours sincerely,

For and on behalf of REC Ltd

Troy Randall   **Stuart Phillips**

Graduate Geo-Environmental Consultant   **Associate Director**