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Our Ref: P8347\GAL

Date: 16th April 2018

Eagley Plastics Ltd
Stephanie Works
Chinley
High Peaks
SK23 6BT

Attention of Amanda Pollitt

Dear Amanda,

Re: Gas Addendum Letter for Cedar Avenue, Harpur Hill

The gas monitoring programme at the above site is now complete. The assessment below supersedes the information in the Site Appraisal Report (GRM/P8347/F.1) and should be submitted to the regulatory bodies for approval.

The Phase I desk study identified the following potential sources of ground gas:

- Deep Made Ground on site.
- Backfilled reservoir off site.

The site is not in an area where radon protective measures are required.

The ground investigation identified the made ground as a potential source of ground gas. The made ground comprised pale brown to brown slightly clayey sand with gravel of brick, concrete, limestone, and partially solidified lime waste with inclusions of brick, limestone, coal and clinker in most exploratory holes to a maximum depth of 4.5m begl, and not penetrated in any area of the site.

As the proposed end use has been classified as low sensitivity (commercial), four 35mm diameter gas/water monitoring standpipes have been installed across the site in the window sample boreholes (WS01-04) and targeted at the made ground (very low generation potential). The rationale behind the gas / groundwater monitoring installations includes WS03 targeting the off-site backfilled reservoir and WS01, WS02 and WS04 targeting general made ground

On the basis of the confirmed source of ground gas and proposed end use, gas monitoring has been carried out weekly over a 1 month period from 5th March 2018 to 21st March 2018, to assess the risk posed to the end user from potentially harmful ground gases. There were three occurrences where WS01 was not in a position to monitor due to snow drifts covering the monitoring point however, it is not considered necessary to carry out any further monitoring due to the general lack of ground gas recorded.

The post fieldwork monitoring has been designed to identify and assess the groundwater and gas regimes below the site. The results are enclosed for reference and are summarised below:

Summary of Results for period:				05/03/2018		to	21/03/2018						
Ground Gases													
				Methane (%v/v)		CO2 (%v/v)		Oxygen (%v/v)		Gas Flow (l/h)		PID Reading (ppm)	
ID	Top	Base	Strata	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
WS01 (2)	1.00	3.00	MG	0.00	0.00	0.00	0.00	20.50	21.20	0.00	0.00	N.R	N.R
WS02 (5)	1.00	3.00	MG	0.00	0.00	0.00	0.10	18.00	21.00	0.00	0.10	0.00	0.00
WS03 (5)	1.00	3.00	MG	0.00	0.00	0.00	0.00	18.10	21.10	0.00	0.10	0.00	0.00
WS04 (5)	0.50	2.00	MG	0.00	0.00	0.00	0.00	17.10	19.40	0.00	0.10	0.03	0.03

Ground Gas Risk Assessment

The primary guidance document to determine if gas protection measures are required is BS8485:2015. This uses hazardous gas flow rates (Qhg), which are gas concentrations multiplied by borehole flow rates, to derive a Gas Screening Value (GSV) for the site. The gas regime is then determined based on the GSV and other limiting factors including gas concentrations and flow rates.

Methane concentrations and flow rates above the monitor's lower limits of detection were not detected during monitoring period. Therefore, in the following assessment the monitors lower limit of detection for methane (0.1% v/v) and flow rate (0.1l/hr) have been used.

Using the default methane concentration of 0.1%v/v and the maximum rate of 0.1l/hr a Qhg of 0.0001l/hr has been calculated for methane. Using the maximum recorded steady state carbon dioxide concentration of 0.1%v/v and the maximum flow rate of 0.1l/hr a Qhg of 0.0001l/hr has been calculated for carbon dioxide. On this basis the GSV for the site is determined as 0.0001l/hr

As the GSV is less than 0.07l/hr and the maximum recorded concentrations of methane and carbon dioxide are less than 1%v/v and 5%v/v respectively, the site has been assessed as 'Characteristic Situation 1' (very low hazard potential) as outlined in Table 2 of BS8485:2015, for which gas protection measures are not required.

Groundwater

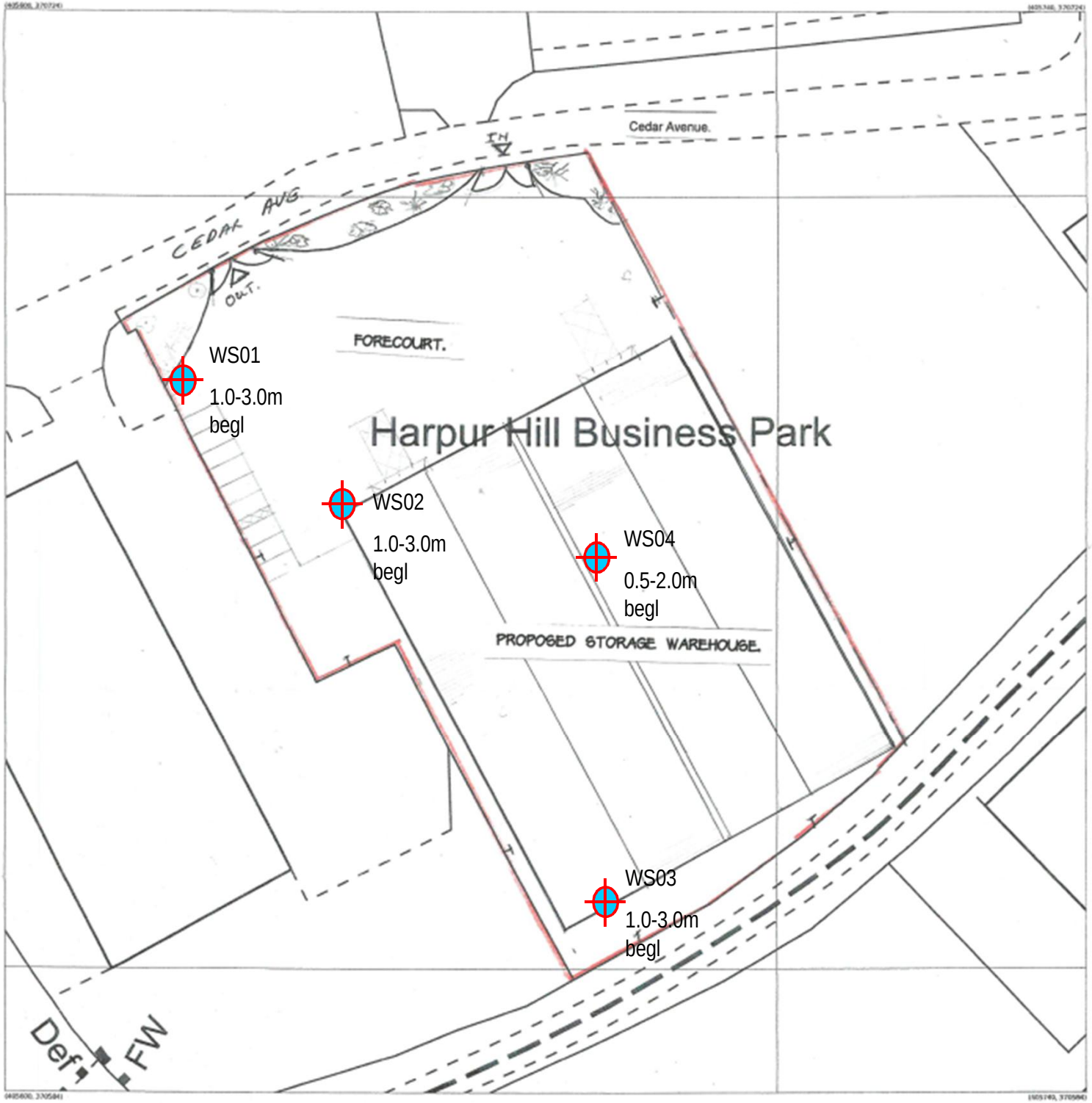
The monitoring program has confirmed the general absence of shallow groundwater beneath the site, and only recorded water at the base of each hole on each visit outlining that this was possibly just perched at the base of the monitoring installation and not representing the true groundwater regime of the general area.

We trust this is suitable for you current requirements, should you require any further information or would like any clarification of the points raised please do not hesitate to contact us.

Yours sincerely,
for GRM Development Solutions Ltd

Matthew Tomkins
Acting Principal Engineering Geologist

Enc:
P8347 Gas Monitoring Location Plan and Gas Monitoring Results



DO NOT SCALE

NOTES:

Gas Monitoring Point

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Laurus House, Centrum 100
Burton-on-Trent, Staffs, DE14 2WH
Tel: 01283 551249 Fax: 01283 211968
info@grm-uk.com www.grm-uk.com

CLIENT: Eagley Plastics Ltd

PROJECT: Harpur Hill off Kirkstone Road, Buxton

TITLE: Gas Monitoring Plan

SCALE@SIZE :	ISSUE:
NTS	FINAL
DESIGN/DRAWN :	DATE:
AS	02/2018
PROJECT No:	DRAWING No:
P8347	

In-Situ Gas Monitoring Results

Project Name:	Harpur Hill off Kirkstone Road Buxton
Project Number:	P8347
Client:	Eagley Plastics Ltd
Date:	05/03/2018
Weather:	Cloudy
Atmospheric Pressure (mb):	936
Pressure Trend:	Rising
Equipment:	Gas Data LMSXi
Operator:	Bryan Burgh

Ground Gases

				Methane %v/v		CO2 %v/v		Oxygen %v/v		Gas Flow l/h		PID Reading ppm	
ID	Top	Base	Strata	Peak	Steady	Peak	Steady	Low	Steady	Peak	Steady	Peak	Steady
WS01	1.00	3.00	MG	Not Recorded		Not Recorded		Not Recorded		Not Recorded		Not Recorded	
WS02	1.00	3.00	MG	0.00	0.00	0.00	0.00	20.50	20.50	0.10	0.10	Not Recorded	
WS03	1.00	3.00	MG	0.00	0.00	0.00	0.00	20.80	20.80	0.10	0.10	Not Recorded	
WS04	0.50	2.00	MG	0.00	0.00	0.00	0.00	19.40	19.40	0.10	0.10	Not Recorded	

Ground Waters

Depth to Groundwater mbegl	Total Well Depth mbegl
Not Recorded	Not Recorded
Not Detected	3.10
Not Detected	3.08
Not Detected	2.26

Comments: WS01 not found, covered in a snow drift

Notes

L.E.L.	Lower Explosive Limit (100% L.E.L.= 5% Flammable Gas)
N.D.	Not Detected
N.R.	Not Recorded
PID	Photo-Ionising Detector
%	By volume

Highlighted cell for following conditions:

a	Methane =>1% v/v
b	Carbon Dioxide =>5% v/v
MG	Made Ground
NS	Natural Strata

Ground Material Key

MG	Made Ground

In-Situ Gas Monitoring Results

Project Name:	Harpur Hill off Kirkstone Road Buxton
Project Number:	P8347
Client:	Eagley Plastics Ltd
Date:	09/03/2018
Weather:	Snow
Atmospheric Pressure (mb):	968
Pressure Trend:	Falling
Equipment:	Gas Data GFM430
Operator:	Ben Derbyshire

Ground Gases

				Methane %v/v		CO2 %v/v		Oxygen %v/v		Gas Flow l/h		PID Reading ppm	
ID	Top	Base	Strata	Peak	Steady	Peak	Steady	Low	Steady	Peak	Steady	Peak	Steady
WS01	1.00	3.00	MG	Not Recorded		Not Recorded		Not Recorded		Not Recorded		Not Recorded	
WS02	1.00	3.00	MG	0.00	0.00	0.00	0.00	18.00	18.00	0.00	0.00	Not Recorded	
WS03	1.00	3.00	MG	0.00	0.00	0.00	0.00	18.10	18.10	0.00	0.00	Not Recorded	
WS04	0.50	2.00	MG	0.00	0.00	0.00	0.00	17.10	17.10	0.00	0.00	Not Recorded	

Ground Waters

Depth to Groundwater mbegl	Total Well Depth mbegl
Not Recorded	Not Recorded
Not Detected	3.10
Not Detected	3.10
Not Detected	2.30

Comments WS01 not found, covered in a snow drift

Notes

L.E.L.	Lower Explosive Limit (100% L.E.L.= 5% Flammable Gas)
N.D.	Not Detected
N.R.	Not Recorded
PID	Photo-Ionising Detector
%	By volume

Highlighted cell for following conditions:

a	Methane =>1% v/v
b	Carbon Dioxide =>5% v/v
MG	Made Ground
NS	Natural Strata

Ground Material Key

MG	Made Ground

In-Situ Gas Monitoring Results

Project Name:	Harpur Hill off Kirkstone Road Buxton
Project Number:	P8347
Client:	Eagley Plastics Ltd
Date:	13/03/2018
Weather:	Drizzle
Atmospheric Pressure (mb):	952
Pressure Trend:	Falling
Equipment:	Gas Data LMSXi
Operator:	Bryan Burgh

Ground Gases

				Methane %v/v		CO2 %v/v		Oxygen %v/v		Gas Flow l/h		PID Reading ppm	
ID	Top	Base	Strata	Peak	Steady	Peak	Steady	Low	Steady	Peak	Steady	Peak	Steady
WS01	1.00	3.00	MG	0.00	0.00	0.00	0.00	21.20	21.20	0.00	0.00	Not Recorded	
WS02	1.00	3.00	MG	0.00	0.00	0.10	0.10	21.00	21.00	0.00	0.00	Not Recorded	
WS03	1.00	3.00	MG	0.00	0.00	0.00	0.00	21.10	21.10	0.00	0.00	Not Recorded	
WS04	0.50	2.00	MG	0.00	0.00	0.00	0.00	19.10	19.10	0.00	0.00	Not Recorded	

Ground Waters

Depth to Groundwater mbegl	Total Well Depth mbegl
Not Detected	3.00
Not Detected	3.10
Not Detected	3.00
Not Detected	2.25

Comments None

Notes

L.E.L.	Lower Explosive Limit (100% L.E.L.= 5% Flammable Gas)
N.D.	Not Detected
N.R.	Not Recorded
PID	Photo-Ionising Detector
%	By volume

Highlighted cell for following conditions:

a	Methane =>1% v/v
b	Carbon Dioxide =>5% v/v
MG	Made Ground
NS	Natural Strata

Ground Material Key

MG	Made Ground

In-Situ Gas Monitoring Results

Project Name:	Harpur Hill off Kirkstone Road Buxton
Project Number:	P8347
Client:	Eagley Plastics Ltd
Date:	14/03/2018
Weather:	Cloudy
Atmospheric Pressure (mb):	949
Pressure Trend:	Falling
Equipment:	Gas Data LMSXi
Operator:	Wayne Barry

Ground Gases

				Methane %v/v		CO2 %v/v		Oxygen %v/v		Gas Flow l/h		PID Reading ppm	
ID	Top	Base	Strata	Peak	Steady	Peak	Steady	Low	Steady	Peak	Steady	Peak	Steady
WS01	1.00	3.00	MG	0.00	0.00	0.00	0.00	20.50	20.50	0.00	0.00	Not Recorded	
WS02	1.00	3.00	MG	0.00	0.00	0.10	0.10	20.50	20.50	0.00	0.00	Not Recorded	
WS03	1.00	3.00	MG	0.00	0.00	0.00	0.00	20.50	20.50	0.00	0.00	Not Recorded	
WS04	0.50	2.00	MG	0.00	0.00	0.00	0.00	18.50	18.50	0.00	0.00	Not Recorded	

Ground Waters

Depth to Groundwater mbegl	Total Well Depth mbegl
Not Detected	3.10
Not Detected	3.13
Not Detected	3.10
Not Detected	2.24

Comments None

Notes

L.E.L.	Lower Explosive Limit (100% L.E.L.= 5% Flammable Gas)
N.D.	Not Detected
N.R.	Not Recorded
PID	Photo-Ionising Detector
%	By volume

Highlighted cell for following conditions:

a	Methane =>1% v/v
b	Carbon Dioxide =>5% v/v
MG	Made Ground
NS	Natural Strata

Ground Material Key

MG	Made Ground

In-Situ Gas Monitoring Results

Project Name:	Harpur Hill off Kirkstone Road Buxton
Project Number:	P8347
Client:	Eagley Plastics Ltd
Date:	21/03/2018
Weather:	Snow
Atmospheric Pressure (mb):	976
Pressure Trend:	Falling
Equipment:	Gas Data LMSXi
Operator:	Ben Derbyshire

Ground Gases

				Methane %v/v		CO2 %v/v		Oxygen %v/v		Gas Flow l/h		PID Reading ppm	
ID	Top	Base	Strata	Peak	Steady	Peak	Steady	Low	Steady	Peak	Steady	Peak	Steady
WS01	1.00	3.00	MG	Not Recorded		Not Recorded		Not Recorded		Not Recorded		Not Recorded	
WS02	1.00	3.00	MG	0.00	0.00	0.00	0.00	20.40	20.40	Not Recorded		0.00	0.00
WS03	1.00	3.00	MG	0.00	0.00	0.00	0.00	20.10	20.10	Not Recorded		0.00	0.00
WS04	0.50	2.00	MG	0.00	0.00	0.00	0.00	18.60	18.60	Not Recorded		0.03	0.03

Ground Waters

Depth to Groundwater mbegl	Total Well Depth mbegl
Not Recorded	Not recorded
Not Detected	3.10
Not Detected	3.10
Not Detected	2.25

Comments WS01 not found, covered in a snow drift

Notes

L.E.L.	Lower Explosive Limit (100% L.E.L.= 5% Flammable Gas)
N.D.	Not Detected
N.R.	Not Recorded
PID	Photo-Ionising Detector
%	By volume

Highlighted cell for following conditions:

a	Methane =>1% v/v
b	Carbon Dioxide =>5% v/v
MG	Made Ground
NS	Natural Strata

Ground Material Key

MG	Made Ground

In-Situ Gas Monitoring Results

Project Name:	Harpur Hill off Kirkstone Road Buxton
Project Number:	P8347
Client:	Eagley Plastics Ltd

Pressure Range:	936mb-976mb
Reading Below 1000mb:	5

Summary of Results for period: 05/03/2018 to 21/03/2018

				Ground Gases										Groundwater	
				Methane (%v/v)		CO2 (%v/v)		Oxygen (%v/v)		Gas Flow (l/h)		PID Reading (ppm)		Depth to Groundwater (mbegl)	
ID	Top	Base	Strata	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
WS01 (2)	1.00	3.00	MG	0.00	0.00	0.00	0.00	20.50	21.20	0.00	0.00	N.R	N.R		
WS02 (5)	1.00	3.00	MG	0.00	0.00	0.00	0.10	18.00	21.00	0.00	0.10	0.00	0.00		
WS03 (5)	1.00	3.00	MG	0.00	0.00	0.00	0.00	18.10	21.10	0.00	0.10	0.00	0.00		
WS04 (5)	0.50	2.00	MG	0.00	0.00	0.00	0.00	17.10	19.40	0.00	0.10	0.03	0.03		

BS8485:2015 Suggested Worse Case Site Classification:

Site Summary:

	GSV (l/h)	Max Values
Methane	0.0001	0.1
CO2	0.0001	0.1
Default Flow (l/h)	0.1	

Notes

L.E.L.	Lower Explosive Limit (100% L.E.L.= 5% Flammable Gas)
N.D.	Not Detected
N.R.	Not Recorded
PID	Photo-Ionising Detector
%	By volume
MG	Made Ground

Highlighted cell for following conditions:

a	Methane =>1% v/v
b	Carbon Dioxide =>5% v/v
GSV	Gas Screening Value:
	Peak state values used for Methane
	Steady state values used for Carbon Dioxide and Gas Flow