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Mark Bray
Bellway Homes
2 Deighton Close
Wetherby
LS22 7GZ

Date: 12th August 2010
Our Ref: C3934/4139/DCB

Dear Mark,

C3934 – Former Polar Ford Garage, Dodworth Road, Barnsley – Additional Site Investigation Works

1.0 Introduction

This report has been prepared for the use of Bellway Homes and their representatives. No other third party may rely upon or reproduce the contents of this report without the written approval of Sirius. If any unauthorised third party comes into possession of this report they rely on it at their own risk and the authors do not owe them any Duty of Care or Skill.

It is understood that it is proposed to develop the site with a residential housing development to incorporate two to three storey housing, access roads and associated landscaping. Detailed proposals for the redevelopment are not yet available.

Sirius Geotechnical and Environmental Ltd (Sirius) has undertaken a preliminary phase of ground investigation at the site in support of the proposed development, and the findings are discussed below.

2.0 Site Description

Table 2.1 - Site Description

Location:	Approximately 2km west of Barnsley town centre, located to the north of Dodworth Road. The National Grid Reference for the site is SE 331 064.
Topography:	The majority of the site is generally level, lying at an elevation of approximately 125m AOD
Surface Cover / Existing Buildings:	At the time of this phase of works the site was predominantly occupied by tarmac and concrete hardstanding. A large concrete floor slab from the previous garage services building was located within the eastern part of the site. The western area of the site comprises a large fenced compound with level rough hardcore surface. An existing commercial building of portal frame and steel clad construction was present within the central part of the site. No access to this area was available during the investigation works. The development site also includes an industrial compound of approximately 1Ha in area located to the east of the main site boundary. This area comprised a medium sized portal framed commercial building with surrounding hardcore surfaced storage yard.
Fuels Storage Tanks:	Former underground fuel storage tanks known to be located on the site resulting from historic use as a petrol filling station.
Adjacent Land Uses:	North: Railway land and cutting East: Residential houses and gardens West: Residential properties with gardens South: Dodworth Road and further residential properties

3.0 Fieldwork

Fieldwork was undertaken between 30th June and 2nd July 2010 and comprised:

- Mechanical excavation of 11 No. Trial pits to a maximum depth of 3.8m bgl.
- Drilling of 8 No. Rotary openhole boreholes using compressed air water mist flush to a maximum depth of 34.5m bgl.
- Installation of 6 No. gas monitoring wells in rotary boreholes.

Trial pits were backfilled with arisings on completion.

Rotary boreholes without installations were backfilled with arisings and sealed at rockhead with bentonite cement.

An exploratory hole location plan showing the positions of trial pits and boreholes is appended to this letter.

4.0 Ground Conditions

A complete record of all the strata encountered in each exploratory hole is provided on the exploratory hole logs appended. The following is intended to summarise the ground conditions present.

4.1 Strata summary

Table 4.1: Summary of Strata Profile

Strata	Depth Range (Thickness Range) (m)	Description and Comments
Made Ground	Ground Level (3.1 to 8.5m)	Encountered at all exploratory hole locations. Made ground was predominantly found to be granular comprising sandy gravel of ash and clinker with varying proportions of concrete, brick, tiles ceramic and glass. Occasionally fragments of plastic, metal and timber waste were recorded (TP7, 8 and 9 towards the western part of the site). A low to high brick cobble content was noted locally. TP11, located within the yard area to the east of the main site encountered cohesive made ground comprising sandy gravelly clay with brick cobbles and rare timber to a depth of 3.1m bgl.
Clay (weathered coal measures)	3.1 – 10.5m (>0.1 to 3.5m)	Firm and stiff, sandy clay – Completely weathered coal measures.
Bedrock	3.0 to 10.50m	Carboniferous Coal Measures mudstone, sandstone and coal. Old workings encountered as

Strata	Depth Range (Thickness Range) (m)	Description and Comments
	(>27m)	detailed below.

NR - not recorded

4.2 Bedrock and Shallow Mining

Strata encountered within the eight rotary openhole boreholes advanced are summarised in Table 4.2 below.

Table 4.2 – Summary of Bedrock Geology Encountered

Hole Reference	Approximate GL (mAOD)	Drilled depth (mBGL)	Rockhead (mBGL)	Rockhead (mAOD)	Evidence of workings / coal (mBGL)	Evidence of workings / coal (mAOD)	Sandstone Strata Encountered (mBGL)	Notes *
RO1	134.4	32.0	5.9	128.5	18.1 – 18.3 Coal (**0.3m**)	116.3 – 116.1 Coal (**0.3m**)	-	Thin Coal – Stratigraphically below Barnsley Thick Coal
RO2	133.2	34.0	8.5	124.7	-	-	10.2 – 12.8m (**2.6m**)	Fractured mudstones encountered between 12.8 and 18.3m possible associated with local faulting.
RO3	133.4	34.5	8.5	124.9	-	-	9.1 – 11.9 (**2.8m**)	No evidence of coal/workings encountered
RO4	134.1	15.0	10.5	123.6	-	-	-	No evidence of coal/workings encountered
RO5	135.8	32.0	4.5	131.3	20.3 – 22.1 Coal (**1.8m**)	115.3 – 113.7 Coal (**1.8m**)	4.5 – 17.8 (**13.3m**)	Barnsley Thick Seam overlain by Barnsley Rock Sandstone – Intact coal encountered. (**Ratio of 6.1** times rock cover to seam thickness)
RO6	136.6	13.0	3.0	133.6	9.0 – 11.0 BG (**2.0m**)	127.6 – 125.6 BG (**2.0m**)	3.0 – 9.0 (**6.0m**)	Old workings in Barnsley Thick Seam overlain by Barnsley Rock Sandstone. (**Ratio of 2.3** times rock cover to seam thickness)
RO7	133.3	33.5	7.5	125.8	18.0 – 20.6 Coal (**2.6m**)	115.3 – 112.7 Coal (**2.6m**)	7.5 – 10.3 (**2.8m**) & 12.5 – 14.1 (**1.6m**)	Barnsley Thick Seam – Overlain by Barnsley rock sandstone interleaved with mudstones and siltstones.
RO8	133.0	34.0	7.0	126.0	30.2 – 33.0 BG (**2.8m**)	102.8 – 100.0 BG (**2.8m**)	7.0 – 11.6 (**4.6m**)	Old workings in Barnsley Thick Seam – Some overlying sandstone possibly the Barnsley Rock. (**Ratio of 8.9** times rock cover to seam thickness)

*Ratio of rock cover to seam thickness based on maximum recorded seam thickness of 2.6m (RO7 and CA abandonment plan.)
BG – Broken Ground representative of old collapsed workings

4.3 Groundwater

No significant groundwater flows were encountered during the intrusive fieldwork. Rotary boreholes were advanced using water mist flush which obscures natural groundwater strikes on drilling, therefore accurate observations of groundwater levels within rotary boreholes could not be made.

4.4 Visual and Olfactory Evidence of Contamination

Made ground encountered within all of the trial pits excavated was noted to contain high proportions of ash and clinker which are commonly associated with elevated concentrations of heavy metals and polyaromatic hydrocarbons (PAHs). Made ground was locally noted to include refuse type materials such as timber and plastic which indicate the potential for a source of hazardous ground gas to be present.

No visual or olfactory evidence of hydrocarbon contamination was encountered.

4.5 Ground Gas

Ground gas monitoring has been carried out on two occasions to date, both at barometric pressures of below 1000mb. Noteworthy results are summarised in Table 4.3 below. Full details of ground gas monitoring results available at the time of writing are appended.

Table 4.3 Summary of Gas Monitoring Results – (2 visits to date)

Well	Methane %v/v (max)	Carbon Dioxide %v/v (max)	Oxygen %v/v (min)	Volatiles ppm (max)	Flow (range) l/hr
RO1	ND	8.2	10.7	ND	ND
RO2	ND	0.4	20.0	ND	0.1 – 0.5
RO4*	ND	0.3	19.8	ND	-1.1
RO5*	ND	7.4	11.0	2.7	ND
RO6*	ND	0.8	19.6	1.5	-0.2
RO7	ND	0.6	19.0	ND	-0.2 – 0.6

* 1 visit only completed to date

The proposed monitoring programme includes 24 visits over a 12 month period. On completion of the monitoring, a full set of results will be issued in an addendum letter.

5.0 Assessment of Preliminary Findings

5.1 Contamination

Constraints due to contamination can not be fully determined without an appropriate programme of chemical testing. However, based on the ashy nature of the made ground observed at the site it is considered likely that elevated concentrations of heavy metals and PAHs will be present. In addition localised ground contamination in the vicinity of the former underground fuel storage tanks within the southern part of the site should be anticipated.

Soils observed are visually and texturally unsuitable for use in gardens and landscaped areas.

It is understood that a further phase of ground investigation including chemical analysis of soils is to be undertaken prior to development.

5.2 Foundations

Due to the thickness of granular made ground present across the whole site area traditional strip foundations will be unsuitable for development on this site. Piles or improvement of the ground via vibro-flotation methods will be required for the proposed development. During the recent site investigation works specialist ground improvement contractors from IGI, Balfour Beatty and Keller visited the site to observe the nature of the made ground. All of the contractors have indicated that vibro-stone ground improvement techniques would be viable to achieve the necessary bearing characteristics for a standard residential type development on the site.

Floor Slabs

Due to the necessity for piling or ground improvement to achieve required bearing capacities, suspended ground floor slabs will be required for any proposed development.

5.3 Excavations and Dewatering

Based on the nature of the overlying made ground, it is considered that excavations through cohesive soils will be unstable. Therefore allowance for either battering back to a safe angle or temporary support measures should be incorporated into the design of excavations, particularly if man entry into excavations is envisaged.

Reference to CIRIA Report 97 'Trenching Practice' should be made to establish suitable methods of ground support or battering back of any excavation face.

Based upon the results of the ground investigation, significant ingress of groundwater at shallow depths is not considered likely, although any groundwater ingress which does occur should be adequately controlled by traditional site pumping practices.

5.4 Stabilisation of Shallow Mine Workings

The results of the intrusive mining investigation carried out to date are summarised within Drawing No. C3934.03 appended. The conclusions which can be drawn from the available information are summarised in Table 5.1 below with reference to the site areas shown on the above drawing.

Table 5.1 – Results of Intrusive Mining Investigation.

Area	Boreholes Referenced	Conclusion	Necessary further works
A	RO1, RO4	Barnsley seam removed by working at outcrop – no stabilisation works required	None
B	RO6	Workings identified within influencing distance of surface	Drill and grout stabilisation works required
C	RO5	Workings identified within influencing distance of the surface – grout stabilisation required	Drill and grout stabilisation works required
D	-	Workings recorded within influencing distance of surface	Drill and grout stabilisation works required
E	RO8	Workings recorded and proven in RO8	Test drilling required to confirm need for drill and grout stabilisation works
F	RO7	Barnsley seam present within influencing distance of surface. No recorded workings	Test drilling required to confirm need for drill and grout stabilisation works
G	RO2	No evidence of Barnsley Seam – no recorded workings, some fractured ground encountered possibly associated with faulting	Test drilling required to confirm need for drill and grout stabilisation works

5.5 Ground Gas

At this stage only preliminary gas monitoring results are available and no reliable conclusions can be drawn on the basis of the information available. However, no significant concentrations of methane have been detected to date and concentrations of carbon dioxide on both monitoring visits completed remained below 10%v/v. Gas flow rates were generally not significant being measured at <1l/s. The preliminary results available suggest that the site would be characterised as 'Amber 1' with regard to gas risk for a proposed residential development. Given the potential sources of hazardous ground gas identified within the vicinity of the site, further gas monitoring results will be required

before firm recommendations can be given regarding the level of gas protection measures required at the site.

We trust that this is adequate for your present needs. However, should you require any further information, or wish to discuss any aspect of these works further, please do not hesitate to contact me at our Durham office.

Yours sincerely,

David Brooks
Senior Engineer

For and on behalf of
Sirius Geotechnical and Environmental Ltd.

Enc.

TRIAL PIT RECORD

TP No. **TP1**

Sheet 1 of 1

Site : Dodworth Road, Barnsley

Contract No: C3934

Client : Bellway Homes Ltd

Dates: 29/06/2010

Method : JCB 3CX equipped with 0.60m wide backhoe bucket

Scale 1:20

Logged By: JW

Checked By:

SAMPLE DETAILS			Groundwater	STRATA RECORD			
Type	Depth From - To(m)	Vane Results kN/m²		Description	Depth (m)	Level (mAOD) PID ppm	Legend
				MADE GROUND. Tarmac.	0.08		
				MADE GROUND: Concrete boulder (base of forecourt).			
D	0.60m - 1.00m			MADE GROUND: Dark grey sandy angular fine to coarse GRAVEL of ash and clinker.	0.60		
				At 1.40m: Electric cable. Assumed to be redundant feed to petrol pumps Trial pit abandoned.			
				End of Trial Pit at 1.40 m	1.40		

Remarks and Water Observations

1) Trial pit abandoned at 1.40m bgl due to live electric cable. Electric cable made safe by YEDL
2) Excavation unstable
3) No groundwater encountered
4) Trial pit backfilled with arisings upon completion

GL (m AOD) -

Easting: -

Northing: -

Fig. No. TP1

TRIAL PIT RECORD

TP No. **TP2**

Sheet 1 of 1

Site : Dodworth Road, Barnsley

Contract No: C3934

Client : Bellway Homes Ltd

Dates: 29/06/2010

Method : JCB 3CX equipped with 0.60m wide backhoe bucket

Scale 1:20

Logged By JW

Checked By.

SAMPLE DETAILS			Groundwater	STRATA RECORD			
Type	Depth From - To(m)	Vane Results kN/m²		Description	Depth (m)	Level (mAOD) PID (ppm)	Legend
				MADE GROUND: Concrete.	0.12		
D	0.30m - 0.60m			MADE GROUND: Dark grey brown angular fine to coarse GRAVEL of sandstone, ash, clinker and concrete with occasional pockets of firm orange brown clay.			
					0.80		
D	1.00m 1.00m - 1.50m			MADE GROUND: Dark grey angular fine to coarse GRAVEL of ash and clinker.			
D	3.50m - 3.60m			*Firm blue green orange brown sandy CLAY. Low plasticity* (field description).	3.50 3.60		
				End of Trial Pit at 3.60 m			

Remarks and Water Observations

1) Excavation stable.
2) No groundwater encountered
3) Trial pit backfilled with arisings upon completion

GL (m AOD) -

Easting: -

Northing: -

Fig. No. TP2

TRIAL PIT RECORD

TP No. **TP3**

Sheet 1 of 1

Site: Dodworth Road, Barnsley

Contract No: C3934

Client: Bellway Homes Ltd

Dates: 29/06/2010

Method: JCB 3CX equipped with 0.60m wide backhoe bucket

Scale 1:20

Logged By: JW

Checked By:

SAMPLE DETAILS			Groundwater	STRATA RECORD			
Type	Depth From - To(m)	Vane Results kN/m²		Description	Depth (m)	Level (mAOD) PID ppm	Legend
				MADE GROUND: Concrete.			
					0.20		
				MADE GROUND: Brown sandy gravelly angular COBBLES and BOULDERS (to 500mm) of concrete and brick. Gravel is angular fine to coarse of concrete and brick.			
D	0.50m						
					1.40		
D	1.50m			MADE GROUND: Dark grey angular fine to coarse GRAVEL of ash and clinker. Occasional angular fine to coarse glass and ceramic fragments and bottles.			
B	2.00m - 2.50m						
					3.60		
				End of Trial Pit at 3.60 m			

Remarks and Water Observations

1) Excavation stable
2) No groundwater encountered
3) Trial pit backfilled with arisings upon completion

GL (m AOD) -

Easting: -

Northing: -

Fig. No. TP3

TRIAL PIT RECORD

TP No. **TP4**

Sheet 1 of 1

Site : Dodworth Road, Barnsley

Contract No: C3934

Client : Bellway Homes Ltd

Dates: 29/06/2010

Method : JCB 3CX equippec with 0.60m wide backhoe bucket

Scale 1:20

Logged By JW

Checked By

SAMPLE DETAILS			Groundwater	STRATA RECORD			
Type	Depth From - To(m)	Vane Results kN/m²		Description	Depth (m)	Level (mAOD) PID ppm	Legend
				MADE GROUND: Tarmac.	0.05		
				MADE GROUND: Light brown slightly sandy angular fine to coarse GRAVEL of limestone.			
					0.35		
D	0.50m - 1.00m			MADE GROUND: Dark grey and brown sandy angular fine to coarse GRAVEL of ash and clinker. Medium to high angular concrete and brick cobble and boulder content. Locally sandy clay.			
					1.80		
D	2.00m - 2.50m			MADE GROUND: Dark grey angular fine to coarse GRAVEL of ash and clinker. Occasional angular fine to coarse glass and ceramic fragments and bottles.			
				End of Trial Pit at 3.70 m	3.70		

Remarks and Water Observations

1) Excavation stable
2) No groundwater encountered
3) Trial pit backfilled with arisings upon completion

GL (m AOD) -

Easting: -

Northing: -

Fig. No. TP4

TRIAL PIT RECORD

TP No. **TP5**

Sheet 1 of 1

Site: Dodworth Road, Barnsley

Contract No: C3934

Client: Bellway Homes Ltd

Dates: 29/06/2010

Method: JCB 3CX equipped with 0 60m wide backhoe bucket

Scale 1:20

Logged By: JW

Checked By:

SAMPLE DETAILS				STRATA RECORD			
Type	Depth From - To(m)	Vane Results kN/m²	Groundwater	Description	Depth (m)	Level (mAOD) PID ppm	Legend
				MADE GROUND: Tarmac.	0 05		
				MADE GROUND: Grey brown angular fine to coarse clayey GRAVEL of ash, clinker and mixed lithologies			
D	0 30m						
					0 60		
				MADE GROUND: Brown sandy locally slightly clayey fine to coarse GRAVEL of mixed lithologies. Low to medium angular brick, concrete and sandstone cobble and boulder content (to 500mm).			
D	0 90m						
B	1 00m - 2 00m						
				At 2.85m: 150mm thick band of orange brown sandy clay.			
					3 00		
				MADE GROUND. Dark grey angular fine to coarse GRAVEL of ash and clinker. Occasional angular fine to coarse fragments of *glass and ceramic and glass bottles.*			
D	3 50m						
				End of Trial Pit at 3 70 m	3 70		

Remarks and Water Observations

1) Excavation stable.
2) No groundwater encountered.
3) Trial pit backfilled with arisings upon completion.

GL (m AOD) -

Easting: -

Northing: -

Fig. No. TP5

TRIAL PIT RECORD

TP No. **TP6**

Sheet 1 of 1

Site : Dodworth Road, Barnsley

Contract No. C3934

Client : Bellway Homes Ltd

Dates: 29/06/2010

Method : JCB 3CX equipped with 0.60m wide backhoe bucket

Scale 1:20

Logged By JW

Checked By

SAMPLE DETAILS			Groundwater	STRATA RECORD			
Type	Depth From - To(m)	Vane Results kN/m²		Description	Depth (m)	Level (mAOD) PID	Legend
				MADE GROUND: Tarmac.	0.05		
				MADE GROUND: Light brown slightly sandy angular fine to coarse of LIMESTONE.	0.30		
D	0.50m			MADE GROUND: Dark grey and brown slightly sandy angular fine to coarse GRAVEL of ash, clinker, concrete and brick. Low to medium angular brick and concrete cobble content. High brick cobble content to west face.			
D	2.00m						
				MADE GROUND: Dark grey angular fine to coarse GRAVEL of ash and clinker. Occasional angular fine to coarse fragments of glass and ceramic and glass bottles.	2.30		
				End of Trial Pit at 2.80 m	2.80		

Remarks and Water Observations

1) Excavation unstable
2) No groundwater encountered
3) Trial pit backfilled with arisings upon completion

GL (m AOD) -

Easting: -

Northing: -

Fig. No. TP6

TRIAL PIT RECORD

TP No. **TP7**

Sheet 1 of 1

Site : Dodworth Road, Barnsley

Contract No: C3934

Client : Bellway Homes Ltd

Dates: 29/06/2010

Method : JCB 3CX equippec with 0 60m wide backhoe bucket

Scale 1:20

Logged By. JW

Checked By

SAMPLE DETAILS			Groundwater	STRATA RECORD			
Type	Depth From - To(m)	Vane Results kN/m²		Description	Depth (m)	Level (mAOD) PID (ppm)	Legend
				MADE GROUND: Tarmac.	0 03		
				MADE GROUND: Grey and orange brown slightly sandy angular fine to coarse GRAVEL of ash, clinker, occasional metal waste, glass, brick, ceramic, plastic; rare glass fibre and glass bottles. Low angular brick cobble content.			
D	0 50m						
D	1.50m						
D	2 50m						
D	3.50m						
				End of Trial Pit at 3.80 m	3 80		

Remarks and Water Observations

1) Excavation stable
2) No groundwater encountered
3) Trial pit backfilled with arisings upon completion

GL (m AOD) -

Easting: -

Northing: -

Fig. No. TP7

TRIAL PIT RECORD

TP No. **TP8**

Sheet 1 of 1

Site : Dodworth Road, Barnsley

Contract No: C3934

Client : Bellway Homes Ltd

Dates: 29/06/2010

Method : JCB 3CX equipped with 0 60m wide backhoe bucket

Scale 1:20

Logged By JW

Checked By

SAMPLE DETAILS			Groundwater	STRATA RECORD			
Type	Depth From - To(m)	Vane Results kN/m²		Description	Depth (m)	Level (mAOD) PID ppm	Legend
				MADE GROUND: Dark grey red brown sandy angular fine to coarse GRAVEL of ash, clinker, glass, brick, occasional metal, wood, glass bottles and plastic sheeting.			
D	0 50m						
				Between 1.00m to 2.00m: 3no. 1.50m long pieces of wood to south face of excavation.			
D	1 50m						
B	2.00m - 3 50m						
				Light brown sandy angular fine to coarse tabular GRAVEL of sandstone.	3 30		
D	3 50m						
				End of Trial Pit at 3.70 m	3 70		

Remarks and Water Observations

1) Excavation stable
2) No groundwater encountered
3) Trial pit backfilled with arisings upon completion

GL (m AOD) -

Easting: -

Northing: -

Fig. No. TP8

TRIAL PIT RECORD

TP No. **TP9**

Sheet 1 of 1

Site : Dodworth Road, Barnsley

Contract No: C3934

Client : Bellway Homes Ltd

Dates: 29/06/2010

Method : JCB 3CX equipped with 0 60m wide backhoe bucket

Scale 1:20

Logged By. JW

Checked By.

SAMPLE DETAILS			Groundwater	STRATA RECORD			
Type	Depth From - To(m)	Vane Results kN/m²		Description	Depth (m)	Level (mAOD) PID ppm	Legend
				MADE GROUND: Dark grey red brown sandy angular fine to coarse GRAVEL of ash, clinker, glass, brick, occasional metal, wood, glass bottles and plastic sheeting.			
D	0 50m						
D	1.50m						
				MADE GROUND. Dark grey angular fine to coarse GRAVEL of ash, clinker and coal (slight organic odour).	3 00		
D	3 20m						
				End of Trial Pit at 3.70 m	3 70		

Remarks and Water Observations

1) Excavation stable.
2) No groundwater encountered
3) Trial pit backfilled with arisings upon completion

Gl. (m AOD) -

Easting: -

Northing: -

Fig. No. TP9

TRIAL PIT RECORD

TP No. **TP10**

Sheet 1 of 1

Site : Dodworth Road, Barnsley

Contract No. C3934

Client : Bellway Homes Ltd

Dates: 29/06/2010

Method : JCB 3CX equipped with 0.60m wide backhoe bucket

Scale 1:20

Logged By JW

Checked By

SAMPLE DETAILS			Groundwater	STRATA RECORD			
Type	Depth From - To(m)	Vane Results kN/m²		Description	Depth (m)	Level (mAOD) PID	Legend
				MADE GROUND: Dark grey and red brown slightly sandy slightly clayey angular COBBLES of brick.			
					0.40		
D	0.50m			*MADE GROUND: Dark grey slightly sandy angular fine to coarse* GRAVEL of ash and clinker. Low to medium angular brick cobble content. Occasional angular fine to coarse GRAVEL of glass, ceramic and rare glass bottles.		
D	1.50m						
D	2.50m						
					3.55		
				Light brown slightly sandy slightly clayey angular tabular *GRAVEL of sandstone.*	3.60		
				End of Trial Pit at 3.60 m			

Remarks and Water Observations

1) Excavation stable.
2) No groundwater encountered.
3) Trial pit backfilled with arisings upon completion

GL (m AOD) -

Easting: -

Northing: -

Fig. No. TP10

TRIAL PIT RECORD

TP No. **TP11**

Sheet 1 of 1

Site : Dodworth Road, Barnsley

Contract No. C3934

Client : Bellway Homes Ltd

Dates: 29/06/2010

Method JCB 3CX equipped with 0.60m wide backhoe bucket

Scale 1:20

Logged By JW

Checked By

SAMPLE DETAILS Type	Depth From - To(m)	Vane Results kN/m²	Groundwater	STRATA RECORD Description	Depth (m)	Level (mAOD) PID	Legend
				MADE GROUND: Tarmac.	0.10		
				MADE GROUND: Light grey slightly sandy angular fine to coarse GRAVEL of limestone.	0.30		
				MADE GROUND: Brown grey slightly sandy slightly gravelly angular COBBLES of brick and concrete.	0.60		
				MADE GROUND: Orange grey brown sandy gravelly CLAY. Low plasticity (field description). Low angular brick and concrete cobble content. Gravel is angular fine to coarse of concrete, brick and rare wood.			
				Stiff light brown sandy gravelly CLAY. Low plasticity (field description). Gravel is angular tabular fine to coarse of sandstone	3.10		
				End of Trial Pit at 3.40 m	3.40		

Remarks and Water Observations

1) Excavation stable.
2) No groundwater encountered
3) Trial pit backfilled with arisings upon completion

GL (m AOD) -

Easting: -

Northing: -

Fig. No. TP11

BOREHOLE RECORD

BH No. **RO1**

Sheet 1 of 4

Site: Dodworth Road, Barnsley

Contract No: C3934

Client: Bellway Homes Ltd

Dates: 30/06/2010

Method: Rotary openhole boring using water mist flush

Scale 1:50

Logged By: JW Checked By

Driller: JS

SAMPLE DETAILS							STRATA RECORD					
Type	Depth From - To (m)	TCR (%)	SCR (%)	RQD (%)	N (FI)	Groundwater (Casing)	Description	Depth (m)	Level (mAOD)	Legend	Well
							MADE GROUND: Granular made ground including concrete and brick.				
							MADE GROUND: Suspected made ground - few flush returns.	4.00	130.40		
							Brown / grey SANDSTONE with siltstone bands.	5.90	128.50		

Continued next sheet

Remarks and Water Observations

1. Gas monitoring well installed on completion as shown

GL (m AOD) 134.40

Easting: -

Northing: -

Fig. No. RO1

BOREHOLE RECORD

BH No. **RO1**
Sheet 2 of 4

Site: Dodworth Road, Barnsley
Contract No: C3934

Client: Bellway Homes Ltd
Dates: 30/06/2010

Method: Rotary openhole boring using water mist flush
Scale 1:50

Logged By: JW Checked By
Driller: JS

SAMPLE DETAILS						STRATA RECORD				
Type	Depth From - To (m)	TCR (%)	SCR (%)	RQD (%)	N (FI)	Groundwater (Casing)	Description	Depth (m)	Level (mAOD)	Legend / Well
							Brown / grey SANDSTONE with siltstone bands.			
							Grey MUDSTONE with occasional siltstone bands.	12.00	122.40	
							COAL	18.10	116.30	
							Grey MUDSTONE/SILTSTONE.	18.30	116.10	
							Continued next sheet			

Remarks and Water Observations

1. Gas monitoring well instaled on completion as shown.

GL (m AOD)
134.40
Easting:
-
Northing:
-

Fig. No.
RO1

BOREHOLE RECORD

BH No. **RO1**
Sheet 3 of 4

Site: Dodworth Road, Barnsley
Contract No: C3934

Client: Bellway Homes Ltd
Dates: 30/06/2010

Method: *Rotary openhole boring using water mist flush*
Scale 1:50

Logged By JW Checked By
Driller JS

SAMPLE DETAILS						Groundwater (Casing)	STRATA RECORD				
Type	Depth From - To (m)	TCR (%)	SCR (%)	ROD (%)	N (FI)		Description	Depth (m)	Level (mAOD)	Legend	Well
							Grey MUDSTONE/SILTSTONE				
								21 80	112 60		
							Grey SILTSTONE.				
								23 70	110 70		
							Grey MUDSTONE with siltstone bands.				

Continued next sheet

Remarks and Water Observations

1 Gas monitoring well instaled on completion as shown.

GL (m AOD) 134.40
Easting: -
Northing: -

Fig. No. RO1

BOREHOLE RECORD

BH No. **RO1**
Sheet 4 of 4

Site: Dodworth Road, Barnsley
Contract No: C3934

Client: Bellway Homes Ltd
Dates: 30/06/2010

Method: *Rotary openhole boring using water mist flush*
Scale 1:50

Logged By. JW Checked By.
Driller. JS

SAMPLE DETAILS							STRATA RECORD				
Type	Depth From - To (m)	TCR (%)	SCR (%)	RQD (%)	N (FI)	Groundwater (Casing)	Description	Depth (m)	Level (mAOD)	Legend	Well
							Grey MUDSTONE with siltstone bands.				
								31			
								32	32.00	102.40	
							End of Borehole at 32.00 m				
								33			
								34			
								35			
								36			
								37			
								38			
								39			

Remarks and Water Observations
1 Gas monitoring well installed on completion as shown

GL (m AOD) 134.40
Easting: -
Northing: -

Fig. No. RO1

BOREHOLE RECORD

BH No. **RO2**

Site: Dodworth Road, Barnsley

Contract No: C3934

Client: Bellway Homes Ltd

Dates: 30/06/2010

Method: Rotary openhole boring using water mist flush

Scale 1:50

Logged By JW Checked By:

Driller JS

SAMPLE DETAILS							STRATA RECORD				
Type	Depth From - To (m)	TCR (%)	SCR (%)	ROD (%)	N (FI)	Groundwater (Casing)	Description	Depth (m)	Level (mAOD)	Legend	Well
							MADE GROUND: Suspected made ground (no flush returns obtained).				
							Grey MUDSTONE.	8.50	124.70		

Continued next sheet

Remarks and Water Observations

1 Gas monitoring well installed on completion as shown.

GL (m AOD) 133.20

Easting: -

Northing: -

Fig. No. RO2

BOREHOLE RECORD

BH No. **RO2**

Site: Dodworth Road, Barnsley

Contract No: C3934

Client: Bellway Homes Ltd

Dates: 30/06/2010

Method: Rotary openhole boring using water mist flush

Scale 1:50

Logged By JW Checked By

Driller JS

SAMPLE DETAILS						STRATA RECORD				
Type	Depth From - To (m)	TCR (%)	SCR (%)	RQD (%)	N (FI)	Groundwater (Casing)	Description	Depth (m)	Level (mAOD)	Legend / Well
							Grey MUDSTONE.	10.20	123.00	
							Brown SANDSTONE (slight loss of flush returns noted).			
								12.80	120.40	
							Grey MUDSTONE (some loss of flush indicating possible fractured ground).			
								18.00	115.20	
							Grey MUDSTONE with siltstone bands (poor returns noted)			

Continued next sheet

Remarks and Water Observations

1 Gas monitoring well installed on completion as shown

GL (m AOD) 133.20

Easting: -

Northing: -

Fig. No. RO2

BOREHOLE RECORD

BH No. **RO2**
Sheet 3 of 4

Site: Dodworth Road, Barnsley
Contract No: C3934

Client: Bellway Homes Ltd
Dates: 30/06/2010

Method: Rotary openhole boring using water mist flush
Scale 1:50

Logged By JW Checked By
Driller JS

SAMPLE DETAILS						Groundwater (Casing)	STRATA RECORD				
Type	Depth From - To (m)	TCR (%)	SCR (%)	RQD (%)	N (FI)		Description	Depth (m)	Level (mAOD)	Legend	Well
							Grey MUDSTONE with siltstone bands (poor returns noted)				
						21	Grey MUDSTONE (poor returns noted).	21.00	112.20		
						22		22			
						23		23			
						24		24			
						25		25			
						26		26			
						27		27			
						28		28			
						29		29			

Continued next sheet

Remarks and Water Observations
1 Gas monitoring well installed on completion as shown

GL (m AOD) 133.20
Easting: -
Northing: -

Fig. No. RO2

BOREHOLE RECORD

BH No. **RO2**
Sheet 4 of 4

Site: Dodworth Road, Barnsley
Contract No: C3934

Client: Bellway Homes Ltd
Dates: 30/06/2010

Method: Rotary openhole boring using water mist flush
Scale 1:50

Logged By JW Checked By:
Driller JS

SAMPLE DETAILS						STRATA RECORD				
Type	Depth From - To (m)	TCR (%)	SCR (%)	RQD (%)	N (FI)	Groundwater (Casing)	Description	Depth (m)	Level (mAOD)	Legend / Well
							Grey MUDSTONE (poor returns noted).			
							End of Borehole at 34.00 m	34.00	99.20	

Remarks and Water Observations
1 Gas monitoring well instaled on completion as shown

GL (m AOD) 133.20
Easting: -
Northing: -

Fig. No. RO2

BOREHOLE RECORD

BH No. **RO3**

Sheet 1 of 4

Site: Dodworth Road, Barnsley

Contract No. C3934

Client: Bellway Homes Ltd

Dates: 01/07/2010

Method: Rotary openhole boring using water mist flush

Scale 1:50

Logged By JW Checked By

Driller JS

SAMPLE DETAILS							STRATA RECORD				
Type	Depth From - To (m)	TCR (%)	SCR (%)	ROD (%)	N (FI)	Groundwater (Casing)	Description	Depth (m)	Level (mAOD)	Legend	Well
							MADE GROUND: Sand and Gravel of ash, clinker and concrete. (few flush returns)				
							Grey MUDSTONE.	8.50	124.90		
							Brown SANDSTONE.	9.10	124.30		
							Continued next sheet				

Remarks and Water Observations

1. Gas monitoring well instaled on completion as shown.

GL (m AOD) 133.40

Easting: -

Northing: -

Fig. No. RO3

BOREHOLE RECORD

BH No. **RO3**
Sheet 2 of 4

Site: Dodworth Road, Barnsley
Contract No: C3934

Client: Bellway Homes Ltd
Dates: 01/07/2010

Method: Rotary openhole boring using water mist flush
Scale 1:50

Logged By JW Checked By
Driller: JS

SAMPLE DETAILS							STRATA RECORD				
Type	Depth From - To (m)	TCR (%)	SCR (%)	RQD (%)	N (FI)	Groundwater (Casing)	Description	Depth (m)	Level (mAOD)	Legend	Well
							Brown SANDSTONE.				
							Grey MUDSTONE.	11.90	121.50		

Continued next sheet

Remarks and Water Observations
1. Gas monitoring well instaled on completion as shown.

GL (m AOD)
133.40
Easting:
-
Northing:
-

Fig. No.
RO3

BOREHOLE RECORD

BH No. **RO3**
Sheet 3 of 4

Site: Dodworth Road, Barnsley
Contract No: C3934

Client: Bellway Homes Ltd
Dates: 01/07/2010

Method: Rotary openhole boring using water mist flush
Scale 1:50

Logged By. JW Checked By.
Driller. JS

SAMPLE DETAILS							STRATA RECORD				
Type	Depth From - To (m)	TCR (%)	SCR (%)	RQD (%)	N (FI)	Groundwater (Casing)	Description	Depth (m)	Level (mAOD)	Legend	Well
							Grey MUDSTONE.				
								21			
								22			
								23			
								24			
								25			
								26			
								27			
								28			
								29			
							Continued next sheet				

Remarks and Water Observations
1. Gas monitoring well instaled on completion as shown

GL (m AOD)
133.40
Easting:
-
Northing:
-

Fig. No.
RO3

BOREHOLE RECORD

BH No. **RO3**
Sheet 4 of 4

Site: Dodworth Road, Barnsley
Contract No: C3934

Client: Bellway Homes Ltd
Dates: 01/07/2010

Method: Rotary openhole boring using water mist flush
Scale 1:50

Logged By JW Checked By
Driller JS

SAMPLE DETAILS							STRATA RECORD				
Type	Depth From - To (m)	TCR (%)	SCR (%)	RQD (%)	N (FI)	Groundwater (Casing)	Description	Depth (m)	Level (mAOD)	Legend	Well
							Grey MUDSTONE.				
							Dark grey MUDSTONE.	32.10	101.30		
							Grey MUDSTONE.	34.00	99.40		
							End of Borehole at 34.50 m	34.50	98.90		

Remarks and Water Observations

1. Gas monitoring well installed on completion as shown.

GL (m AOD) 133.40
Easting: -
Northing: -

Fig. No. RO3

BOREHOLE RECORD

BH No. **RO4**
Sheet 1 of 2

Site: Dodworth Road, Barnsley
Contract No: C3934

Client: Bellway Homes Ltd
Dates: 01/07/2010

Method: Rotary openhole boring using water mist: flush
Scale 1:50

Logged By: JW Checked By
Driller: JS

SAMPLE DETAILS							STRATA RECORD				
Type	Depth From - To (m)	TCR (%)	SCR (%)	RQD (%)	N (FI)	Groundwater (Casing)	Description	Depth (m)	Level (mAOD)	Legend	Well
							MADE GROUND: Dark grey SAND and GRAVEL of ash and clinker (few flush returns).				
							Grey brown CLAY.	7.00	127.00		
							Continued next sheet				

Remarks and Water Observations
1. Gas monitoring well installed on completion as shown.

GL (m AOD)
134.00
Easting:
-
Northing:
-

Fig. No.
RO4

BOREHOLE RECORD

BH No. **RO4**
Sheet 2 of 2

Site: Dodworth Road, Barnsley
Contract No. C3934

Client: Bellway Homes Ltd
Dates: 01/07/2010

Method: Rotary openhole boring using water mist flush
Scale 1:50

Logged By. JW Checked By
Driller. JS

SAMPLE DETAILS							STRATA RECORD				
Type	Depth From - To (m)	TCR (%)	SCR (%)	RQD (%)	N (FI)	Groundwater (Casing)	Description	Depth (m)	Level (mAOD)	Legend	Well
							Grey brown CLAY.				
							Grey MUDSTONE.	10.50	123.50		
							End of Borehole at 15.00 m	15.00	119.00		

Remarks and Water Observations
1. Gas monitoring well instaled on completion as shown.

GL (m AOD)
134.00
Easting:
-
Northing:
-

Fig. No.
RO4

BOREHOLE RECORD

BH No. **RO5**
Sheet 1 of 4

Site: Dodworth Road, Barnsley
Contract No: C3934

Client: Bellway Homes Ltd
Dates: 01/07/2010

Method: Rotary openhole boring using water mist flush
Scale 1:50

Logged By JW Checked By.
Driller JS

SAMPLE DETAILS						STRATA RECORD				
Type	Depth From - To (m)	TCR (%)	SCR (%)	RQD (%)	N (FI)	Groundwater/ (Casing)	Description	Depth (m)	Level (mAOD)	Legend / Well
							MADE GROUND: Made ground including landfill type materials (driller noted fragments of plastic).			
							Brown SANDSTONE.	4.50	131.30	

Continued next sheet

Remarks and Water Observations
1 Gas monitoring well installed on completion as shown.

GL (m AOD) 135.80
Easting: -
Northing: -

Fig. No. RO5

BOREHOLE RECORD

BH No. **RO5**
Sheet 2 of 4

Site: Dodworth Road, Barnsley

Contract No: C3934

Client: Bellway Homes Ltd

Dates: 01/07/2010

Method: Rotary openhole boring using water mist flush

Scale 1:50

Logged By. JW Checked By

Driller. JS

SAMPLE DETAILS							STRATA RECORD				
Type	Depth From - To (m)	TCR (%)	SCR (%)	RQD (%)	N (FI)	Groundwater (Casing)	Description	Depth (m)	Level (mAOD)	Legend	Well
							Brown SANDSTONE.				
								17.60	118.00		
							Weak grey MUDSTONE.				
							Continued next sheet				

Remarks and Water Observations

1. Gas monitoring well instaled on completion as shown.

GL (m AOD) 135.80

Easting: -

Northing: -

Fig. No. RO5

BOREHOLE RECORD

BH No. **RO5**
Sheet 3 of 4

Site: Dodworth Road, Barnsley
Contract No: C3934

Client: Bellway Homes Ltd
Dates: 01/07/2010

Method: Rotary openhole boring using water mist flush
Scale 1:50

Logged By: JW Checked By:
Driller: JS

SAMPLE DETAILS							STRATA RECORD				
Type	Depth From - To (m)	TCR (%)	SCR (%)	ROD (%)	N (FI)	Groundwater (Casing)	Description	Depth (m)	Level (mAOD)	Legend	Well
							Weak grey MUDSTONE.				
							COAL	20.30	115.50		
								22.10	113.70		
							Grey MUDSTONE.				

Continued next sheet

Remarks and Water Observations

1. Gas monitoring well installed on completion as shown.

GL (m AOD) 135.80
Easting: -
Northing: -

Fig. No. RO5

BOREHOLE RECORD

BH No. **RO5**
Sheet 4 of 4

Site: Dodworth Road, Barnsley
Contract No: C3934

Client: Bellway Homes Ltd
Dates: 01/07/2010

Method: Rotary openhole boring using water mist flush
Scale 1:50

Logged By JW Checked By
Driller JS

SAMPLE DETAILS							STRATA RECORD				
Type	Depth From - To (m)	TCR (%)	SCR (%)	RQD (%)	N (FI)	Groundwater (Casing)	Description	Depth (m)	Level (mAOD)	Legend	Well
							Grey MUDSTONE.				
							End of Borehole at 30.50 m	30.50	105.30		

Remarks and Water Observations
1 Gas monitoring well installed on completion as shown

GL (m AOD)
135.80
Easting:
-
Northing:
-

Fig. No.
RO5

BOREHOLE RECORD

BH No. **RO6**
Sheet 1 of 2

Site: Dodworth Road, Barnsley
Contract No. C3934

Client: Bellway Homes Ltd
Dates: 02/07/2010

Method: Rotary openhole boring using water mist flush
Scale 1:50

Logged By JW Checked By
Driller JS

SAMPLE DETAILS							STRATA RECORD				
Type	Depth From - To (m)	TCR (%)	SCR (%)	RQD (%)	N (FI)	Groundwater (Casing)	Description	Depth (m)	Level (mAOD)	Legend	Well
							MADE GROUND: Insufficient returns to describe.				
							Brown SANDSTONE.	3	3.00	133.60	
							Broken ground - loss of al flush returns.	9	9.00	127.60	
							Continued next sheet				

Remarks and Water Observations
1. Gas monitoring well installed on completion as shown

GL (m AOD)
136.60
Easting:
-
Northing:
-

Fig. No.
RO6

BOREHOLE RECORD

BH No. **RO6**
Sheet 2 of 2

Site: Dodworth Road, Barnsley
Contract No: C3934

Client: Bellway Homes Ltd
Dates: 02/07/2010

Method: Rotary openhole boring using water mist flush
Scale 1:50

Logged By JW Checked By
Driller JS

SAMPLE DETAILS							STRATA RECORD				
Type	Depth From - To (m)	TCR (%)	SCR (%)	RQD (%)	N (Pl)	Groundwater (Casing)	Description	Depth (m)	Level (mAOD)	Legend	Well
							Broken ground - loss of al flush returns				
	11						Hard Strata - No flush returns.	11 11.00	125.60		
	12							12			
	13						End of Borehole at 13.00 m	13 13.00	123.60		
	14							14			
	15							15			
	16							16			
	17							17			
	18							18			
	19							19			

Remarks and Water Observations

1 Gas monitoring well installed on completion as shown

GL (m AOD) 136.60
Easting: -
Northing: -

Fig. No. RO6

BOREHOLE RECORD

BH No. **RO7**
Sheet 1 of 4

Site: Dodworth Road, Barnsley
Contract No: C3934

Client: Bellway Homes Ltd
Dates: 02/07/2010

Method: Rotary openhole boring using water mist flush
Scale 1:50

Logged By JW Checked By:
Driller JS

SAMPLE DETAILS							STRATA RECORD				
Type	Depth From - To (m)	TCR (%)	SCR (%)	RQD (%)	N (FI)	Groundwater (Casing)	Description	Depth (m)	Level (mAOD)	Legend	Well
							MADE GROUND: SAND and GRAVEL including ash, clinker and concrete.				
							Brown SANDSTONE.	7.50	125.80		
							Continued next sheet				

Remarks and Water Observations
1. Gas monitoring well installed on completion as shown

GL (m AOD) 133.30
Easting: -
Northing: -

Fig. No. RO7

BOREHOLE RECORD

BH No. **RO7**
Sheet 2 of 4

Site: Dodworth Road, Barnsley

Contract No: C3934

Client: Bellway Homes Ltd

Dates: 02/07/2010

Method: Rotary openhole boring using water mist flush

Scale 1:50

Logged By JW Checked By

Driller JS

SAMPLE DETAILS						STRATA RECORD				
Type	Depth From - To (m)	TCR (%)	SCR (%)	RQD (%)	N (FI)	Groundwater (Casing)	Description	Depth (m)	Level (mAOD)	Legend / Well
							Brown SANDSTONE.			
							Grey MUDSTONE.	10.30	123.00	
								12.50	120.80	
							Brown SANDSTONE.			
								14.10	119.20	
							Grey MUDSTONE.			
								18.00	115.30	
							COAL			

Continued next sheet

Remarks and Water Observations

1. Gas monitoring well installed on completion as shown

GL (m AOD) 133.30
Easting: -
Northing: -

Fig. No. RO7

BOREHOLE RECORD

BH No. **RO7**
Sheet 3 of 4

Site: Dodworth Road, Barnsley
Contract No: C3934

Client: Bellway Homes Ltd
Dates: 02/07/2010

Method: Rotary openhole boring using water mist flush
Scale 1:50

Logged By JW Checked By:
Driller JS

SAMPLE DETAILS							STRATA RECORD				
Type	Depth From - To (m)	TCR (%)	SCR (%)	RQD (%)	N (FI)	Groundwater (Casing)	Description	Depth (m)	Level (mAOD)	Legend	Well
							COAL				
								20.60	112.70		
							Grey MUDSTONE.				
								21			
								22			
								23			
								24			
								25			
								26			
								27			
								28			
								29			

Continued next sheet

Remarks and Water Observations

1. Gas monitoring well installed on completion as shown

GL (m AOD)
133.30
Easting:
-
Northing:
-

Fig. No.
RO7

BOREHOLE RECORD

BH No. **RO7**
Sheet 4 of 4

Site. Dodworth Road, Barnsley

Contract No C3934

Client: Bellway Homes Ltd

Dates: 02/07/2010

Method. Rotary openhole boring using water mist flush

Scale 1:50

Logged By JW Checked By.

Driller JS

SAMPLE DETAILS							STRATA RECORD				
Type	Depth From - To (m)	TCR (%)	SCR (%)	RQD (%)	N (FI)	Groundwater (Casing)	Description	Depth (m)	Level (mAOD)	Legend	Well
							Grey MUDSTONE.				
							End of Borehole at 33.50 m	33.50	99.80		

Remarks and Water Observations

1. Gas monitoring well installed on completion as shown.

GL (m AOD) 133.30

Easting: -

Northing: -

Fig. No. RO7

BOREHOLE RECORD

BH No. **RO8**
Sheet 1 of 4

Site: Dodworth Road, Barnsley
Contract No: C3934

Client: Bellway Homes Ltd
Dates: 02/07/2010

Method: Rotary openhole boring using water mist flush
Scale 1:50

Logged By JW Checked By.
Driller. JS

SAMPLE DETAILS							STRATA RECORD				
Type	Depth From - To (m)	TCR (%)	SCR (%)	RQD (%)	N (FI)	Groundwater (Casing)	Description	Depth (m)	Level (mAOD)	Legend	Well
							MADE GROUND.				
							Brown SANDSTONE.	7.00	126.00		
							Continued next sheet				

Remarks and Water Observations
1. Gas monitoring well instaled on completion as shown

GL (m AOD) 133.00
Easting: -
Northing: -

Fig. No. RO8

BOREHOLE RECORD

BH No. **RO8**
Sheet 2 of 4

Site: Dodworth Road, Barnsley
Contract No: C3934

Client: Bellway Homes Ltd
Dates: 02/07/2010

Method: Rotary openhole boring using water mist flush
Scale 1:50

Logged By: JW Checked By
Driller: JS

SAMPLE DETAILS							STRATA RECORD				
Type	Depth From - To (m)	TCR (%)	SCR (%)	RQD (%)	N (FI)	Groundwater (Casing)	Description	Depth (m)	Level (mAOD)	Legend	Well
							Brown SANDSTONE.				
							Grey MUDSTONE.	11.60	121.40		
							Grey SILTSTONE.	17.50	115.50		

Continued next sheet

Remarks and Water Observations
1 Gas monitoring well instaled on completion as shown

GL (m AOD)
133.00
Easting:
-
Northing:
-

Fig. No.
RO8

BOREHOLE RECORD

BH No. **RO8**
Sheet 3 of 4

Site: Dodworth Road, Barnsley
Contract No: C3934

Client: Bellway Homes Ltd
Dates: 02/07/2010

Method: Rotary openhole boring using water mist flush
Scale 1:50

Logged By: JW Checked By
Driller JS

SAMPLE DETAILS							STRATA RECORD				
Type	Depth From - To (m)	TCR (%)	SCR (%)	RQD (%)	N (FI)	Groundwater (Casing)	Description	Depth (m)	Level (mAOD)	Legend	Well
							Grey SILTSTONE.				
								22.10	110.90		
							Grey MUDSTONE.				

Continued next sheet

Remarks and Water Observations
1. Gas monitoring well instated on completion as shown

GL (m AOD)
133 00
Easting:
-
Northing:
-

Fig. No.
RO8

BOREHOLE RECORD

BH No. **RO8**
Sheet 4 of 4

Site: Dodworth Road, Barnsley
Contract No: C3934

Client: Bellway Homes Ltd
Dates: 02/07/2010

Method: Rotary openhole boring using water mist flush
Scale 1:50

Logged By JW Checked By
Driller: JS

SAMPLE DETAILS						STRATA RECORD				
Type	Depth From - To (m)	TCR (%)	SCR (%)	RQD (%)	N (Ft)	Groundwater (Casing)	Description	Depth (m)	Level (mAOD)	Legend / Well
							Grey MUDSTONE.	30.20	102.80	
							Soft/broken ground - loss of flush returns.			
							Hard strata - no flush returns recovered.	33.33.00	100.00	
							End of Borehole at 34.00 m	34.34.00	99.00	

Remarks and Water Observations
1 Gas monitoring well installed on completion as shown

GL (m AOD) 133.00
Easting: -
Northing: -

Fig. No. RO8

Ground Gas and Groundwater Monitoring Record Sheet

JOB DETAILS:

Client:	Bellway Homes	**Job No:**	C3934		
Site:	Dodworth Road, Barnsley.	**Visit No:**	1	of	24 over 12 months
Date:	15/07/2010	**Operator:**	TC	**Project Manager:**	DCB

Monitoring Point	GAS CONCENTRATIONS												VOLATILES		FLOW DATA				WELL AND WATER DATA					Comments
	Methane (%v/v)		%LEL		Carbon dioxide (%v/v)		Carbon monoxide (%v/v)		Hydrogen sulphide (%v/v)		Oxygen (%v/v)		PID Peak (ppm)	Product thickness (mm)	Flow rate (l/hr)		Differential borehole Pressure (Pa)	Time for flow to equalise (secs)	Water level (mbgl)	Depth of well (m)	Reduced level (mAOD)	Water level (mAOD)	Response Zone	
	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Min.	Steady			Peak	Steady								
RO 1	ND	ND	ND	ND	8.2	8.2	ND	ND	ND	ND	11.3	11.3	ND		-0.2	-0.2		5	3.95	9.92				
RO 2	ND	ND	ND	ND	0.4	0.4	ND	ND	ND	ND	20.3	20.3	ND		0.5	0.5		2	14.37	15.9				
RO7	ND	ND	ND	ND	0.6	0.6	ND	ND	ND	ND	19	19	ND		0.6	0.6			7.53	9.85				
RO 4																				9				
RO 5																				9.9				
RO 6																				10.1				
Max	0	0	0	0	8.2	8.2	0	0	0	0	20.3	20.3	0	0	0.6	0.6	0	5	14.37	15.9	0	0.00		
Min	0	0	0	0	0.4	0.4	0	0	0	0	11.3	11.3	0	0	-0.2	-0.2	0	2	3.95	9	0	0.00		
GSV (l/hr)	0				0.0492																			

METEOROLOGICAL AND SITE INFORMATION: (Select correct box with X or enter data, as applicable)

State of ground:		Dry		Moist	X	Wet		Snow		Frozen
Wind:		Calm		Light	X	Moderate		Strong		
Cloud cover:		None		Slight		Cloudy	X	Overcast		
Precipitation:		None	X	Slight		Moderate		Heavy		
Barometric pressure (mbar):			982	Before			982	After		
Pressure trend:				Falling	X	Steady		Rising		
Air Temperature (Deg. C):			20	Before			20	After		

INSTRUMENTATION TECHNICAL SPECIFICATIONS:

Ground gas meter: LMSx Multigas Analyser

Gas concentration: **CH_4** ND **CO_2** ND **O_2** 21.20%

Gas Range: **CH_4** 0-100% **CO_2** 0-100% **O_2** 0-25%

Gas Flow range: -100l/hr to +300l/hr

Differential Pressure: -0.10mbar to +0.80mbar

Date of last calibration: 01/07/2010

Date of next calibration:

PID: Phocheck 3000

Calibrated range: 0-100ppm

Calibration gas: Isobutylene

Response time: 0.1s

Accuracy: plus/minus 5% displayed Reading

Date of last calibration: 01/07/2010

Date of next calibration:

Ground Gas and Groundwater Monitoring Record Sheet

JOB DETAILS:

Client:	Bellway Homes	**Job No:**	C3934
Site:	Dodworth Road, Barnsley.	**Visit No:**	2 of 24 over 12 months
Date:	26/07/2010	**Operator:**	TC **Project Manager:** DCB

Monitoring Point	GAS CONCENTRATIONS: Methane (%v/v) Peak	Methane (%v/v) Steady	%LEL Peak	%LEL Steady	Carbon dioxide (%v/v) Peak	Carbon dioxide (%v/v) Steady	Carbon monoxide (%v/v) Peak	Carbon monoxide (%v/v) Steady	Hydrogen sulphide (%v/v) Peak	Hydrogen sulphide (%v/v) Steady	Oxygen (%v/v) Min.	Oxygen (%v/v) Steady	VOLATILES: PID Peak (ppm)	Product thickness (mm)	FLOW DATA: Flow rate (l/hr) Peak	Flow rate (l/hr) Steady	Differential borehole Pressure (Pa)	Time for flow to equalise (secs)	WELL AND WATER DATA: Water level (mbgl)	Depth of well (m)	Reduced level (mAOD)	Water level (mAOD)	Response Zone	Comments
RO 1	ND	ND	ND	ND	7.3	7.3	ND	ND	ND	ND	10.7	10.7	ND		ND	ND			3.93					
RO 2	ND	ND	ND	ND	0.1	0.1	ND	ND	ND	ND	20	20	ND		0.1	0.1		2	14.97					
RO7	ND	ND	ND	ND	0.1	0.1	ND	ND	ND	ND	19.9	19.9	ND		-0.2	-0.2			7.4					
RO 4	ND	ND	ND	ND	0.3	0.3	ND	ND	ND	ND	19.8	19.8	ND		-1.1	-1.1		2	5.56					
RO 5	ND	ND	ND	ND	7.4	7.4	ND	ND	ND	ND	11	11	2.7		ND	ND			7.45					
RO 6	ND	ND	ND	ND	0.8	0.7	ND	ND	ND	ND	19.6	20	1.5		-0.2	-0.2		2	6.34					
Max	*0*	*0*	*0*	*0*	*7.4*	*7.4*	*0*	*0*	*0*	*0*	*20*	*20*	*2.7*	*0*	*0.1*	*0.1*	*0*	*2*	*14.97*	*0*	*0*	*0.00*		
Min	0	0	0	0	0.1	0.1	0	0	0	0	10.7	10.7	1.5	0	-1.1	-1.1	0	2	3.93	0	0	0.00		
GSV (l/hr)	0				0.0074																			

METEOROLOGICAL AND SITE INFORMATION: (Select correct box with X or enter data, as applicable)

State of ground.		Dry		Moist	X	Wet		Snow		Frozen
Wind:	X	Calm		Light		Moderate		Strong		
Cloud cover:		None		Slight		Cloudy	X	Overcast		
Precipitation:		None	X	Slight		Moderate		Heavy		
Barometric pressure (mbar):			999	Before			999	After		
Pressure trend:				Falling	X	Steady		Rising		
Air Temperature (Deg. C):			19	Before			19	After		

INSTRUMENTATION TECHNICAL SPECIFICATIONS:

Ground gas meter: GA2000
Gas concentration: **CH_4** ND **CO_2** ND **O_2** 20.20%
Gas Range: **CH_4** 0-100% **CO_2** 0-100% **O_2** 0-25%
Gas Flow range: -100l/hr to +300l/hr
Differential Pressure: -0.10mbar to +0.80mbar
Date of last calibration: 01/07/2010
Date of next calibration:

PID: Photocheck 3000
Calbrated range: 0-100ppm
Calibration gas: Isobutylene
Response time: 0.1s
Accuracy: plus/minus 5% displayed Reading
Date of last calibration: 01/07/2010
Date of next calibration: