

Our Ref: 18-099.01L

By Email

Mr W Hadfield
Wayne Hadfield Developments Ltd
Tower Street
Barnsley
South Yorkshire
S70 1QS

6th April 2018

Dear Wayne

Re: Proposed Development at Tower Street, Barnsley S70 1QS (Job no. 18-099).

Further to our site visit, please find enclosed the following documents;

- Borehole location plan
- Borehole logs (RBH01- RBH03)

1.0 Introduction

Arc Environmental Ltd. were instructed by Wayne Hadfield Developments Ltd. to undertake a ground investigation for the proposed development at Tower Street, Barnsley in South Yorkshire, to undertake a series of rotary boreholes to assess the nature of underlying coal seams present beneath the site and to ascertain if there are any unrecorded workings.

The scope of works was designed around the findings of a Coal Mining Risk Assessment (CMRA) undertaken by Eastwood & Partners in July 2017 (Report ref.: 41527-001) which highlighted the requirement for confirmatory rotary boreholes.

The intrusive works comprised the sinking of 3 no. rotary open boreholes, locations of which can be seen on the attached borehole location plan. This plan should be used for orientating purposes only, as the positions shown are approximate and the plan is not to a standard scale.

The information contained within this report is limited to the area of the site as indicated on the borehole location plan attached and to those areas accessible during the ground investigation. The depths of the strata on the borehole logs are recorded from current ground levels.

2.0 Ground Conditions

The initial ground conditions comprised grass over a topsoil typically a dark brown sandy gravelly clayey soil with occasional anthropogenic debris, to depths of between c.0.30m and c.0.60m. The underlying natural strata comprised an orangish brown sandy slightly gravelly clay to between c.1.60m and c.1.80m.

Solid geology was recorded from between c.1.60m and c.1.80m, and comprised sandstones, mudstone and siltstone with interbedded coal seams of the Pennine Middle Coal Measures. From the CMRA, a fault was indicated to bisect the south eastern portion of the site, trending in a north-east south-west direction. As a result the geology encountered in the three borehole differed, with correlations between RBH01 and RBH02 which typically encountered mudstones and siltstone with interbedded coal seams whilst RBH03, which was on the other side of the fault encountered predominantly sandstones with interbedded coal seams.



Arc Environmental Ltd.
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Re: Proposed Development at Tower Street, Barnsley S70 1QS (Job no. 18-099)(Cont'd).

The coal seams encountered are summarised in Table 1 for the western portion of the site, and Table 2 for the eastern portion of the site below.

Table 1 – coal seams encountered to the west of the Fault.

Borehole	Depth of Coal Seam (m)	Seam Thickness (m)	Comments
RBH01	5.10-5.80	0.70	Identified as the Abdy Coal Seam, noted as being intact with no voids.
RBH01	9.80-10.10	0.30	Identified as the Top Beamshaw Coal, noted as being intact with no voids.
RBH02	8.40-9.10	0.70	Identified as the Abdy Coal Seam, noted as being intact with no voids.
RBH02	12.50-12.75	0.25	Identified as the Top Beamshaw Coal, noted as being intact with no voids.
RBH02	21.90-22.50	0.60	Identified as the Low Beamshaw Coal, noted as being intact with no voids.

Table 2 – coal seams encountered to the east of the Fault.

Borehole	Depth of Coal Seam (m)	Seam Thickness (m)	Comments
RBH03	4.80-5.90	0.90	All seams were noted as being intact with no voids.
RBH03	11.20-11.60	0.40	
RBH03	17.90-18.20	0.30	

All coal seams encountered were recorded as intact, with no evidence of voiding, broken ground or unrecorded workings. Mine gases were monitored during drilling with no Carbon Dioxide (CO₂) or Methane (CH₄) recorded.

3.0 Groundwater

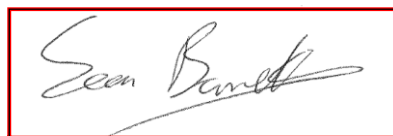
Groundwater was encountered within RBH01 and RBH02 at 5.90m and 20.40m respectively. No water was encountered within RBH03, suggesting that the fault limits horizontal migration of groundwater under the site.

4.0 Conclusions:

The site is underlain by solid geology comprising the Pennine Middle Coal Measures, noted as a coal bearing formation. The rotary boreholes have identified several coal seams underlying the site, of varying thicknesses. All the seams encountered were noted to be intact with no evidence of unrecorded workings and/or voids. Therefore, based on the ground investigation carried out, it is concluded that there is no risk to the site posed by the shallow underlying coal seams.

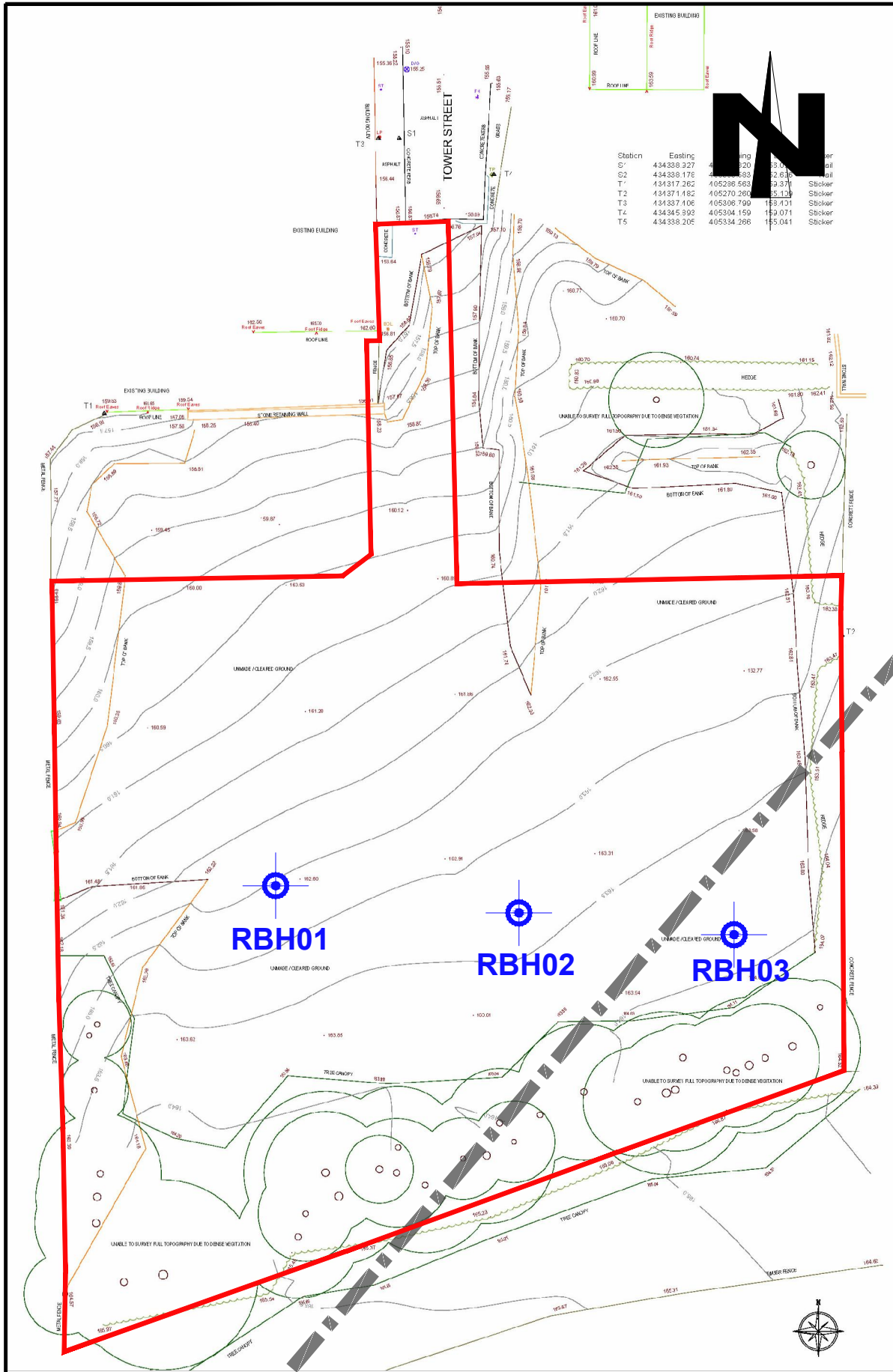
We trust the information provided to you is to your satisfaction, however if you require any further information or clarification, please do not hesitate to contact us.

Yours sincerely,
for and on behalf of Arc Environmental Limited



Sean Barrett BSc (Hons) FGS
Geotechnical Engineer.

Borehole Location Plan and Logs,



ARC ENVIRONMENTAL LTD

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The contractor shall check all dimensions on site before commencement of any works. No dimensions to be scaled off this drawing.
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LEGEND	
	APPROXIMATE SITE BOUNDARY
	CONJECTURED POSITION OF FAULT
	ROTARY BOREHOLE POSITION

rev.	date	amendments	drawn	chckd

Client: **WAYNE HADFIELD DEVELOPMENTS LTD**

Project Title:
Proposed Residential Development
Tower Street
Barnsley, S70 1QS

Drawing Title:
Rotary Borehole Location Plan

Scale at A3: NTS @ A3	Date: 06.04.18	Drawn by: P.D	Approved by: S.B
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Job Ref: 18-099	Drg no: —	Rev: —
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BOREHOLE LOG

Project Tower Street, Barnsley				BOREHOLE No RBH01	
Job No 18-099	Date 27-03-18	Ground Level (m)	Co-Ordinates ()		
Contractor Arc Environmental Ltd				Sheet 1 of 1	

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION		
						0.40	Grass over dark brown sandy gravelly clayey soil (MADE GROUND: Topsoil).		
						1.60	Firm to stiff orangish greyish brown slightly sandy slightly gravelly CLAY.		
						(1.40) 3.00	Brown mottled grey fine grained weathered MUDSTONE (Pennine Middle Coal Measures).		
						(2.10)	Grey fine grained MUDSTONE (Pennine Middle Coal Measures).		
						5.10 5.80	Coal		
							Grey fine grained MUDSTONE (Pennine Middle Coal Measures).		
						(4.00)			
						9.80			
						10.10	Coal		
						(4.90)	Grey to dark grey fine grained SILTSTONE (Pennine Middle Coal Measures).		
						15.00			

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
											1. Groundwater encountered at c.6.00m. 2. Borehole backfilled with arisings
All dimensions in metres Scale 1:175			Client Hadfield Developments Ltd			Method/ Plant Used T44 Berretta Rotary Rig				Logged By SAB	

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BOREHOLE LOG

Project Tower Street, Barnsley				BOREHOLE No RBH02	
Job No 18-099	Date 27-03-18	Ground Level (m)	Co-Ordinates ()		
Contractor Arc Environmental Ltd				Sheet 1 of 1	

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION		
						0.60	Grass over dark brown sandy gravelly clayey soil (MADE GROUND: Topsoil).		
						1.70	Firm to stiff orangish greyish brown slightly sandy slightly gravelly CLAY.		
						(2.80)	Brown mottled grey fine grained weathered MUDSTONE (Pennine Middle Coal Measures).		
						4.50			
						(3.90)	Grey fine grained MUDSTONE (Pennine Middle Coal Measures).		
						8.40			
						9.10	Coal		
						(3.40)	Grey fine grained MUDSTONE (Pennine Middle Coal Measures).		
						12.50			
						12.75	Coal		
						(9.15)	Grey mottled brown fine to medium grained SILTSTONE (Pennine Middle Coal Measures).		
						21.90			
						22.50	Coal		
						(4.50)	Grey fine grained MUDSTONE (Pennine Middle Coal Measures).		
						27.00			

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
											1. Groundwater encountered at c.21.00m. 2. Borehole backfilled with arisings
All dimensions in metres Scale 1:175			Client Hadfield Developments Ltd			Method/ Plant Used T44 Berretta Rotary Rig				Logged By SAB	

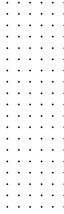
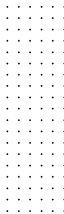
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BOREHOLE LOG

Project Tower Street, Barnsley				BOREHOLE No RBH03	
Job No 18-099	Date 27-03-18	Ground Level (m)	Co-Ordinates ()		
Contractor Arc Environmental Ltd				Sheet 1 of 1	

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION		
						0.30	Grass over dark brown sandy gravelly clayey soil (MADE GROUND: Topsoil).		
						(1.50)			
						1.80	Firm to stiff orangish greyish brown slightly sandy slightly gravelly CLAY.		
						(3.00)	Brown mottled grey fine grained weathered MUDSTONE (Pennine Middle Coal Measures).		
						4.80			
						5.70	Coal		
						(5.50)	Brown fine to medium grained SANDSTONE (Pennine Middle Coal Measures).		
						11.20			
						11.60	Coal		
						(6.30)	Brown/pink/grey fine to medium grained SANDSTONE (Pennine Middle Coal Measures).		
						17.90			
						18.20	Coal		
						(5.80)	Grey mottled brown fine to medium grained SANDSTONE (Pennine Middle Coal Measures).		
						24.00			

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
											1. No groundwater encountered. 2. Borehole backfilled with arisings.
All dimensions in metres Scale 1:175			Client Hadfield Developments Ltd			Method/ Plant Used T44 Berretta Rotary Rig				Logged By SAB	

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