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0 1 km

## Bedrock Aquifer Designation

### General

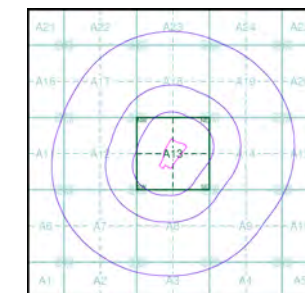
- ◊ Specified Site
- Specified Buffer(s)
- X Bearing Reference Point
- Slice
- B Map ID

### Agency and Hydrological

#### Geological Classes

- Principal Aquifer
- Secondary A Aquifer
- Secondary B Aquifer
- Secondary Undifferentiated
- Unproductive Strata
- Unknown
- Unknown (Lakes and Landslip)

### Site Sensitivity Context Map - Slice A

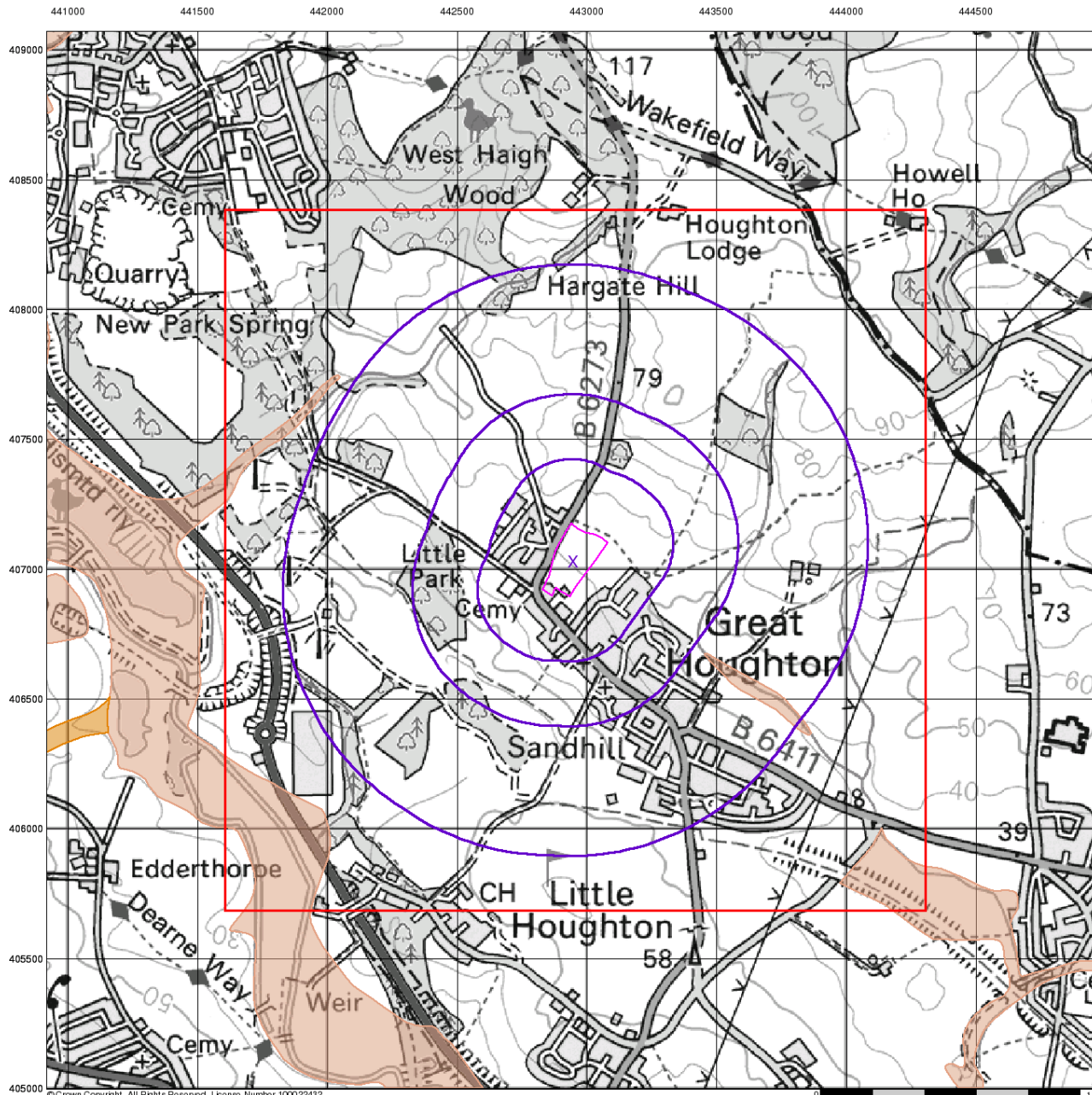


### Order Details

Order Number: 315590317\_1\_1  
 Customer Ref: 48417  
 National Grid Reference: 442950, 407030  
 Slice: A  
 Site Area (Ha): 3.56  
 Search Buffer (m): 1000

### Site Details

Site at 442960, 407060



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## Superficial Aquifer Designation

### General

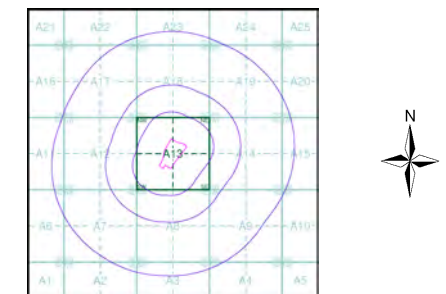
- ◆ Specified Site
- Specified Buffer(s)
- ✕ Bearing Reference Point
- Slice
- B Map ID

### Agency and Hydrological

#### Geological Classes

- Principal Aquifer
- Secondary A Aquifer
- Secondary B Aquifer
- Secondary Undifferentiated
- Unproductive Strata
- Unknown
- Unknown (Lakes and Landslip)

### Site Sensitivity Context Map - Slice A

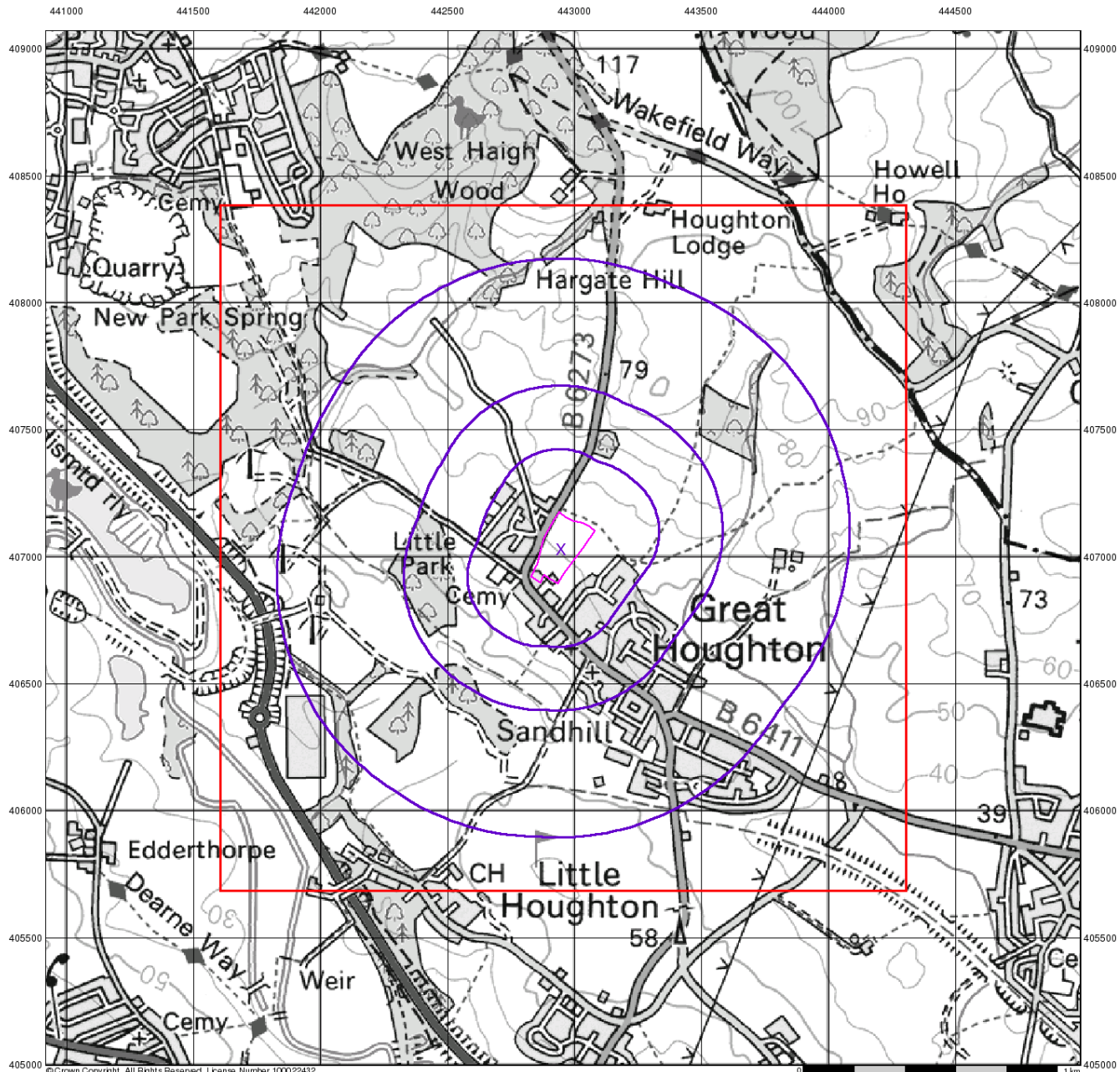


### Order Details

Order Number: 315590317\_1\_1  
 Customer Ref: 48417  
 National Grid Reference: 442950, 407030  
 Slice: A  
 Site Area (Ha): 3.56  
 Search Buffer (m): 1000

### Site Details

Site at 442960, 407060



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## Source Protection Zones

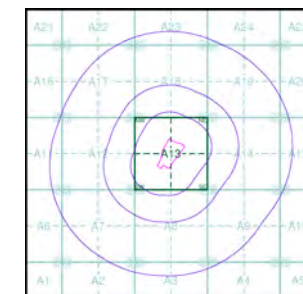
### General

- ◆ Specified Site
- Specified Buffer(s)
- ✕ Bearing Reference Point
- Slice
- B Map ID

### Agency and Hydrological

- Inner zone (Zone 1)
- Inner zone - subsurface activity only (Zone 1c)
- Outer zone (Zone 2)
- Outer zone - subsurface activity only (Zone 2c)
- Total catchment (Zone 3)
- Total catchment - subsurface activity only (Zone 3c)
- Special interest (Zone 4)

### Site Sensitivity Context Map - Slice A

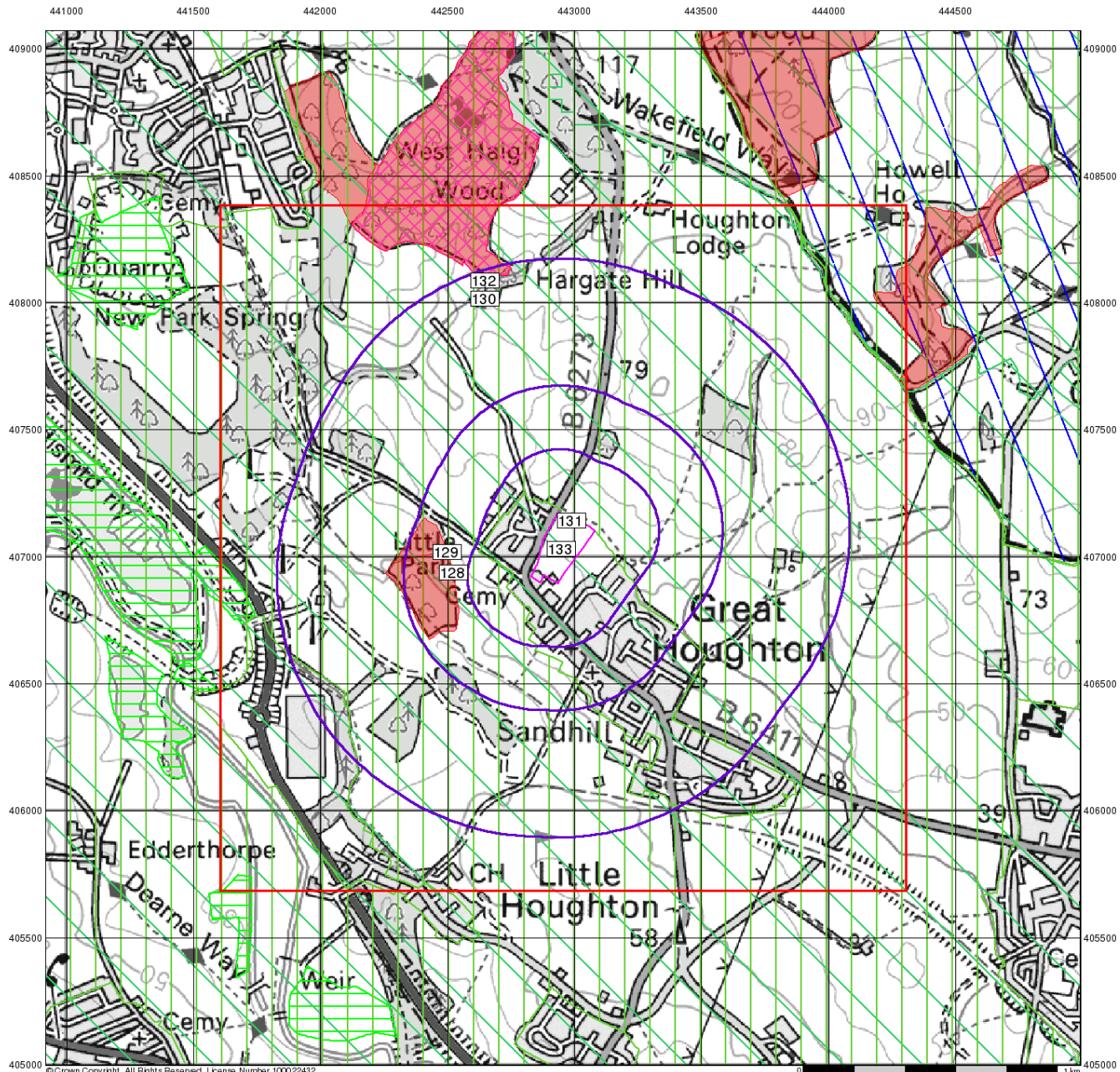


### Order Details

Order Number: 315590317\_1\_1  
 Customer Ref: 48417  
 National Grid Reference: 442950, 407030  
 Slice: A  
 Site Area (Ha): 3.56  
 Search Buffer (m): 1000

### Site Details

Site at 442960, 407060



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## Sensitive Land Uses

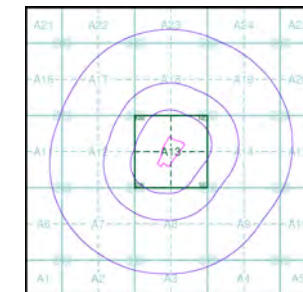
### General

- ◆ Specified Site
- Specified Buffer(s)
- X Bearing Reference Point
- Slice
- B Map ID

### Sensitive Land Uses

- |   |  |
|---|--|
| <span style="background-color: red; width: 10px; height: 10px; display: inline-block;"></span> Ancient Woodland                     | <span style="border: 1px solid black; width: 10px; height: 10px; display: inline-block;"></span> National Park                       |
| <span style="border: 1px solid green; width: 10px; height: 10px; display: inline-block;"></span> Area of Adopted Green Belt         | <span style="border: 1px solid pink; width: 10px; height: 10px; display: inline-block;"></span> Nitrate Sensitive Area               |
| <span style="border: 1px solid blue; width: 10px; height: 10px; display: inline-block;"></span> Area of Unadopted Green Belt        | <span style="border: 1px dashed green; width: 10px; height: 10px; display: inline-block;"></span> Nitrate Vulnerable Zone            |
| <span style="background-color: blue; width: 10px; height: 10px; display: inline-block;"></span> Area of Outstanding Natural Beauty  | <span style="border: 1px solid orange; width: 10px; height: 10px; display: inline-block;"></span> Ramsar Site                        |
| <span style="border: 1px solid lightblue; width: 10px; height: 10px; display: inline-block;"></span> Environmentally Sensitive Area | <span style="border: 1px solid green; width: 10px; height: 10px; display: inline-block;"></span> Site of Special Scientific Interest |
| <span style="border: 1px solid brown; width: 10px; height: 10px; display: inline-block;"></span> Forest Park                        | <span style="border: 1px solid purple; width: 10px; height: 10px; display: inline-block;"></span> Special Area of Conservation       |
| <span style="border: 1px solid pink; width: 10px; height: 10px; display: inline-block;"></span> Local Nature Reserve                | <span style="border: 1px solid green; width: 10px; height: 10px; display: inline-block;"></span> Special Protection Area             |
| <span style="border: 1px solid brown; width: 10px; height: 10px; display: inline-block;"></span> Marine Nature Reserve              | <span style="background-color: yellow; width: 10px; height: 10px; display: inline-block;"></span> World Heritage Sites               |
| <span style="border: 1px solid orange; width: 10px; height: 10px; display: inline-block;"></span> National Nature Reserve           |  |

### Site Sensitivity Context Map - Slice A

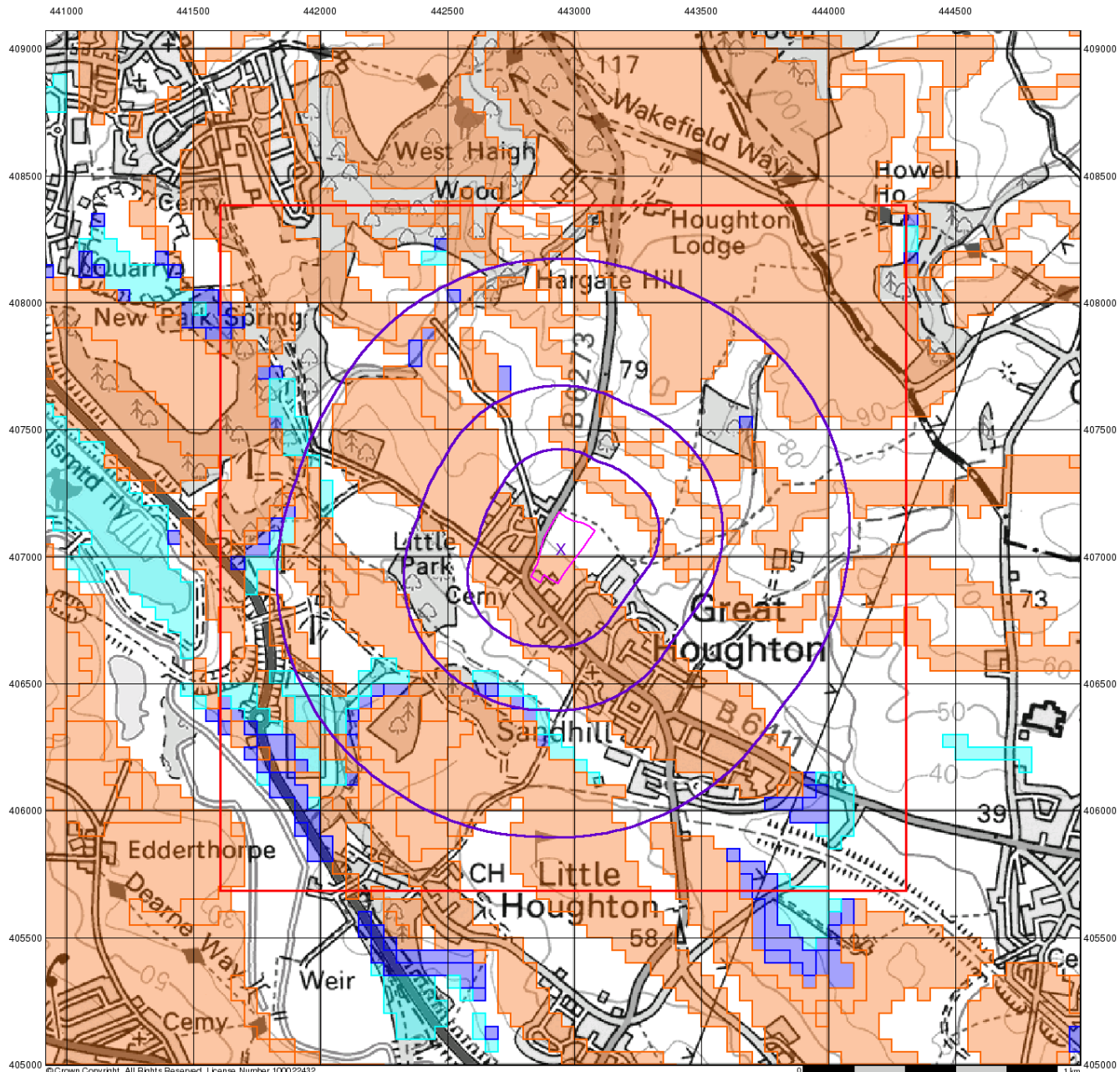


### Order Details

Order Number: 315590317\_1\_1  
 Customer Ref: 48417  
 National Grid Reference: 442950, 407030  
 Slice: A  
 Site Area (Ha): 3.56  
 Search Buffer (m): 1000

### Site Details

Site at 442960, 407060



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## BGS Flood GFS Data

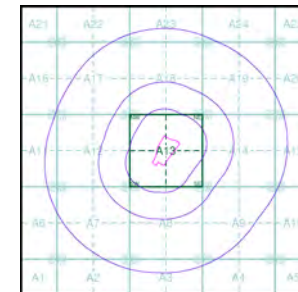
### General

- ◆ Specified Site
- Specified Buffer(s)
- X Bearing Reference Point
- Slice

### Agency and Hydrological (Flood)

- Limited Potential for Groundwater Flooding to Occur
- Potential for Groundwater Flooding of Property Situated Below Ground Level
- Potential for Groundwater Flooding to Occur at Surface

### Site Sensitivity Context Map - Slice A



### Order Details

Order Number: 315590317\_1\_1  
 Customer Ref: 48417  
 National Grid Reference: 442950, 407030  
 Slice: A  
 Site Area (Ha): 3.56  
 Search Buffer (m): 1000

### Site Details

Site at 442960, 407060

## Index Map

For ease of identification, your site and buffer have been split into Slices, Segments and Quadrants. These are illustrated on the Index Map opposite and explained further below.

### Slice

Each slice represents a 1:10,000 plot area (2.7km x 2.7km) for your site and buffer. A large site and buffer may be made up of several slices (represented by a red outline), that are referenced by letters of the alphabet, starting from the bottom left corner of the slice "grid". This grid does not relate to National Grid lines but is designed to give best fit over the site and buffer.

### Segment

A segment represents a 1:2,500 plot area. Segments that have plot files associated with them are shown in dark green, others in light blue. These are numbered from the bottom left hand corner within each slice.

### Quadrant

A quadrant is a quarter of a segment. These are labelled as NW, NE, SW, SE and are referenced in the datasheet to allow features to be quickly located on plots. Therefore a feature that has a quadrant reference of A7NW will be in Slice A, Segment 7 and the NW Quadrant.

A selection of organisations who provide data within this report:



Envirocheck reports are compiled from 136 different sources of data.

## Client Details

Mrs K Betson, Eastwood & Partners Ltd, St Andrews House, 23 Kingfield Road, Sheffield, S11 9AS

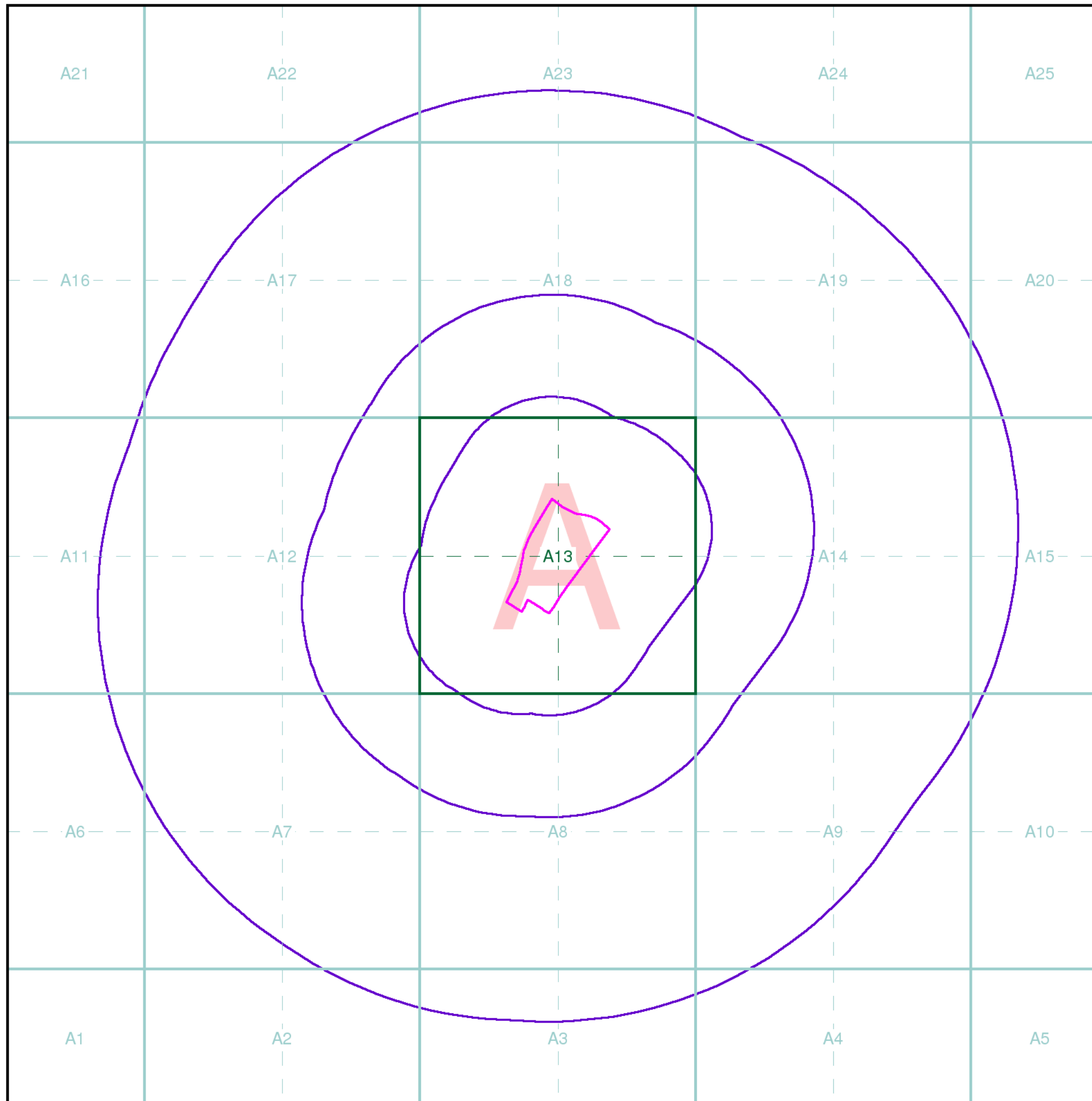
## Order Details

Order Number: 315590317\_1\_1  
Customer Ref: 48417  
National Grid Reference: 442950, 407030  
Site Area (Ha): 3.56  
Search Buffer (m): 1000

## Site Details

Site at 442960, 407060





Full Terms and Conditions can be found on the following link:  
<http://www.landmarkinfo.co.uk/Terms/Show/515>



## Appendix 3

Trial Pit Logs, TP01 to TP24  
Rotary Borehole Logs, BH01 to BH03  
Site Investigation Photographs


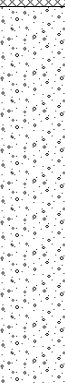


Project Name Manor Farm	Project No. 48417	Co-ords: 442839.00 - 406917.00 Level: 62.60	Date 30/08/2023
Location: Great Houghton, South Yorkshire		Dimensions: <span style="border: 1px solid black; display: inline-block; width: 100px; height: 20px; vertical-align: middle;"></span> m	Scale 1:20
Client: Avant Homes		Depth: 2.00m	Logged DN

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
0.10	ES		0.15	62.45		MADE GROUND: Brown very gravelly SAND. Gravel is fine to coarse angular of sandstone, concrete, brick, clinker, and rare glass and coal.
			0.35	62.25		MADE GROUND: Dark brown slightly gravelly SAND. Gravel is fine to coarse angular of brick.
0.60	ES					Brown slightly gravelly silty fine to medium SAND. Gravel is fine to coarse angular of sandstone. <i>Redundant cable encountered at 0.45m.</i>
			1.10	61.50		Very weak light brown medium-grained SANDSTONE recovered as very sandy fine to coarse angular gravel. Slow progress at base. <i>Recovered with low cobble content below 1.6m.</i>
			2.00	60.60		Trialpit Complete at 2.000m

Remarks: Pit terminated at 2.0m due to slow progress. Groundwater not encountered. Backfilled with arisings.

Stability: Stable.

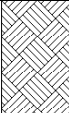
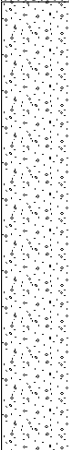
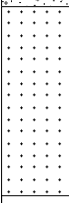

Project Name Manor Farm		Project No. 48417	Co-ords: 442868.00 - 406949.00 Level: 61.60	Date 30/08/2023
Location: Great Houghton, South Yorkshire			Dimensions: <input type="text"/> m	Scale 1:20
Client: Avant Homes			Depth: 1.90m	Logged DN

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
0.10	ES					MADE GROUND: Brown very sandy GRAVEL with high cobble content. Gravel and cobbles of brick, concrete and sandstone.
			0.50	61.10		Light brown very sandy GRAVEL. Gravel is fine to coarse angular of sandstone.
0.90	ES					Extremely weak light brown medium-grained SANDSTONE recovered as very sandy fine to coarse angular gravel. Slow progress at base.
			1.50	60.10		<i>Below 1.7m: Very weak and recovered with low cobble content.</i>
			1.90	59.70		Trialpit Complete at 1.900m

Remarks: Pit terminated at 1.9m due to slow progress. Groundwater not encountered. Backfilled with arisings.

Stability: Stable.

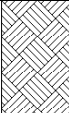
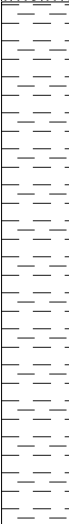

Project Name Manor Farm	Project No. 48417	Co-ords: 442872.00 - 406982.00 Level: 60.60	Date 30/08/2023
Location: Great Houghton, South Yorkshire		Dimensions: <span style="border: 1px solid black; display: inline-block; width: 100px; height: 20px; vertical-align: middle;"></span> m	Scale 1:20
Client: Avant Homes		Depth: 2.00m	Logged DN

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
0.10	ES		0.30	60.30		TOPSOIL: Dark brown silty very gravelly SAND with medium cobble content. Gravel is fine to coarse angular of sandstone and brick fragments. Cobbles of brick.
0.50	ES					Light brown gravelly fine to coarse SAND. Gravel is fine to coarse angular of sandstone.
			1.50	59.10		Extremely weak light brown medium-grained SANDSTONE recovered as very sandy fine to coarse angular gravel. Slow progress at base.
			2.00	58.60		Below 1.7m: Very weak and recovered with low cobble content.
Trialpit Complete at 2.000m						

Remarks: Pit terminated at 2.0m due to slow progress. Groundwater not encountered. Backfilled with arisings.

Stability: Stable.





Project Name Manor Farm	Project No. 48417	Co-ords: 442898.00 - 407001.00 Level: 59.55	Date 30/08/2023
Location: Great Houghton, South Yorkshire		Dimensions: <span style="border: 1px solid black; display: inline-block; width: 100px; height: 20px; vertical-align: middle;"></span> m	Scale 1:20
Client: Avant Homes		Depth: 1.90m	Logged DN

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
0.10	ES		0.30	59.25		TOPSOIL: Dark brown slightly gravelly very silty SAND. Gravel is fine to coarse angular of sandstone.
0.80 0.80	D	HVP=115				Stiff grey mottled brown CLAY.
			1.70	57.85		Very weak brown fine-grained SANDSTONE recovered as slightly sandy fine to coarse angular platy gravel. Slow progress at base.
			1.90	57.65		Trialpit Complete at 1.900m

Remarks: Pit terminated at 1.9m due to slow progress. Groundwater not encountered. Backfilled with arisings. HVP = Average hand shear vane reading in kN/m2.

Stability: Stable.

Project Name Manor Farm	Project No. 48417	Co-ords: 442878.00 - 407028.00 Level: 59.50	Date 30/08/2023
Location: Great Houghton, South Yorkshire		Dimensions: <span style="border: 1px solid black; padding: 2px 10px;">m</span>	Scale 1:20
Client: Avant Homes		Depth: <span style="border: 1px solid black; padding: 2px 10px;">E</span> 2.20m	Logged DN

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
0.10	ES		0.25	59.25		TOPSOIL: Dark brown slightly gravelly sandy CLAY. Gravel is fine to coarse angular of sandstone.
0.40	ES		0.80	58.70		Stiff brown/grey slightly gravelly CLAY. Gravel is fine to coarse subangular of sandstone.
1.00		HVP=136	2.00	57.50		Stiff grey mottled brown CLAY.
			2.20	57.30		Extremely weak brown SILTSTONE with frequent gravel-sized dark grey mudstone lithorelicts, recovered as slightly sandy fine to coarse angular gravel. Slow progress at base.
Trialpit Complete at 2.200m						

Remarks: Pit terminated at 2.2m due to slow progress. Groundwater not encountered. Backfilled with arisings. HVP = Average hand shear vane reading in kN/m2.

Stability: Stable.


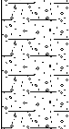


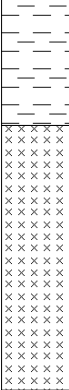
Project Name Manor Farm	Project No. 48417	Co-ords: 442935.00 - 407043.00 Level: 57.70	Date 30/08/2023
Location: Great Houghton, South Yorkshire		Dimensions: <input type="text"/> m	Scale 1:20
Client: Avant Homes		Depth: 2.15m	Logged DN

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
0.10	ES		0.30	57.40		TOPSOIL: Dark brown very clayey SAND.
			0.65	57.05		Orangish brown very clayey very gravelly fine to medium SAND. Gravel is fine to coarse angular of sandstone.
0.90		HVP=111				Stiff grey mottled brown CLAY.
1.50	D		1.60	56.10		Extremely weak dark grey clayey shaly MUDSTONE recovered as angular platy gravel.
			1.70	56.00		Extremely weak grey/brown SILTSTONE recovered as clayey fine to coarse angular gravel.
			2.15	55.55		Trialpit Complete at 2.150m

Remarks: Pit terminated at 2.15m due to slow progress. Groundwater not encountered. Backfilled with arisings. HVP = Average hand shear vane reading in kN/m2.

Stability: Stable.







Project Name Manor Farm	Project No. 48417	Co-ords: 442894.00 - 407075.00 Level: 58.15	Date 30/08/2023
Location: Great Houghton, South Yorkshire		Dimensions: <span style="border: 1px solid black; display: inline-block; width: 100px; height: 20px; vertical-align: middle;"></span> m	Scale 1:20
Client: Avant Homes		Depth: 2.30m	Logged DN

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
0.10	ES		0.25	57.90		TOPSOIL: Dark brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse angular of sandstone, brick fragments and ceramic fragments.
			0.60	57.55		Orangish brown slightly gravelly very clayey fine to medium SAND. Gravel is fine to medium angular of sandstone.
0.80 0.80	D	HVP=60	0.95	57.20		Firm light grey mottled orangish brown CLAY.
1.10		HVP=103	1.60	56.55		Stiff light grey mottled orangish brown CLAY.
			2.30	55.85		Extremely weak grey/brown SILTSTONE with frequent mudstone interbeds, recovered as fine to coarse angular gravel. Slow progress at base.
Trialpit Complete at 2.300m						

Remarks: Pit terminated at 2.3m due to slow progress. Groundwater not encountered. Backfilled with arisings. HVP = Average hand shear vane reading in kN/m2.

Stability: Stable.


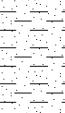
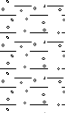
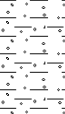
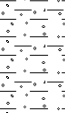

Project Name Manor Farm	Project No. 48417	Co-ords: 442935.00 - 407088.00 Level: 56.80	Date 31/08/2023
Location: Great Houghton, South Yorkshire		Dimensions: <span style="border: 1px solid black; display: inline-block; width: 100px; height: 20px; vertical-align: middle;"></span> m	Scale 1:20
Client: Avant Homes		Depth: 2.40m	Logged DN

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
0.10	ES		0.25	56.55		TOPSOIL: Dark brown slightly gravelly sandy CLAY. Gravel is fine to coarse angular of sandstone.
0.40	ES		0.50	56.30		Firm brown sandy CLAY.
0.90		HVP=100	1.20	55.60		Stiff light grey mottled orangish brown CLAY.
			1.90	54.90		Stiff grey mottled brown CLAY.
			2.00	54.80		Extremely weak grey shaly MUDSTONE recovered as clayey fine to coarse angular platy gravel.
			2.40	54.40		Extremely weak brown SILTSTONE recovered as fine to coarse angular gravel.
Trialpit Complete at 2.400m						

Remarks: Pit terminated at 2.4m due to slow progress. Groundwater not encountered. Soakaway test (SA1) carried out in pit. Backfilled with arisings. HVP = Average hand shear vane reading in kN/m2.

Stability: Stable.

Project Name Manor Farm	Project No. 48417	Co-ords: 442927.00 - 407131.00 Level: 56.70	Date 30/08/2023
Location: Great Houghton, South Yorkshire		Dimensions: <span style="border: 1px solid black; display: inline-block; width: 100px; height: 20px; vertical-align: middle;"></span> m	Scale 1:20
Client: Avant Homes		Depth: 2.30m	Logged DN

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
0.10	ES		0.25	56.45		TOPSOIL: Dark brown slightly gravelly sandy CLAY. Gravel is fine to coarse angular to rounded of sandstone and rare glass.
0.40	ES		0.60	56.10		Stiff brown slightly sandy CLAY.
1.00 1.00	D	HVP=123	1.60 1.65	55.10 55.05		Stiff light grey mottled orangish brown slightly gravelly CLAY. Gravel is fine to coarse angular of mudstone.
			1.80	54.90		Stiff dark brownish grey gravelly CLAY. Gravel is fine to coarse angular of platy shale/mudstone. (Completely weathered shale) Firm greyish brown CLAY.
			2.10	54.60		Stiff grey/brown gravelly CLAY. Gravel is fine to coarse angular of siltstone and mudstone.
			2.30	54.40		Extremely weak brown SILTSTONE recovered as fine to coarse platy gravel.
Trialpit Complete at 2.300m						

Remarks: Pit terminated at 2.3m due to slow progress. Groundwater not encountered. Backfilled with arisings. HVP = Average hand shear vane reading in kN/m2.

Stability: Stable.






















Project Name Manor Farm	Project No. 48417	Co-ords: 442979.00 - 407094.00 Level: 55.75	Date 30/08/2023
Location: Great Houghton, South Yorkshire		Dimensions: <input type="text"/> m	Scale 1:20
Client: Avant Homes		Depth: 2.10m	Logged DN

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
0.10	ES		0.25	55.50		TOPSOIL: Dark brown slightly gravelly very clayey SAND. Gravel is fine to coarse angular of sandstone.
			0.55	55.20		Brown silty gravelly fine to medium SAND. Gravel is fine to coarse angular of weakly cemented sand.
			0.85	54.90		Firm grey mottled orangish brown sandy CLAY.
0.90	ES		1.55	54.20		Extremely weak dark grey completely weathered COAL recovered as clayey fine to coarse angular gravel.
1.40	D		1.70	54.05		Grey/brown very clayey GRAVEL. Gravel is fine to medium angular of siltstone. (Completely weathered siltstone) Slow progress at base.
			2.10	53.65		Trialpit Complete at 2.100m

Remarks: Pit terminated at 2.1m due to slow progress. Groundwater not encountered. Backfilled with arisings.

Stability: Stable.

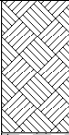
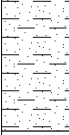
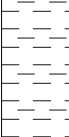



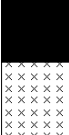




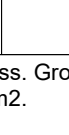
Project Name Manor Farm	Project No. 48417	Co-ords: 442997.00 - 407136.00 Level: 55.65	Date 30/08/2023
Location: Great Houghton, South Yorkshire		Dimensions: <span style="border: 1px solid black; padding: 2px 10px;">m</span>	Scale 1:20
Client: Avant Homes		Depth: <span style="border: 1px solid black; padding: 2px 10px;">E</span> 2.90m	Logged DN

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
0.10	ES		0.20	55.45		TOPSOIL/MADE GROUND: Stiff brown slightly gravelly CLAY. Gravel is fine to coarse angular of sandstone.
						MADE GROUND: Stiff grey/brown slightly sandy slightly gravelly CLAY with low cobble content. Gravel and cobbles are angular of sandstone.
0.50	ES					
						
						
						
			1.25	54.40		Plastic land drain present in south end of pit at 1.0m. Coarse gravel (aggregate) present above drain from 0.4m.
						Layer of bricks (old reservoir/pond base) encountered from 1.15-1.25m.
			1.35	54.30		Stiff orangish brown gravelly CLAY. Gravel is fine to coarse angular of sandstone. (Possible made ground)
						Extremely weak black COAL recovered as sandy fine to coarse angular gravel.
						
			1.80	53.85		Stiff grey CLAY.
						
			2.10	53.55		Extremely weak black COAL recovered as sandy fine to coarse angular gravel.
						
			2.30	53.35		Extremely weak grey SILTSTONE with frequent black carbonaceous inclusions, recovered as fine to coarse angular gravel.
						
			2.50	53.15		Extremely weak black COAL recovered as sandy fine to coarse angular gravel.
						
			2.70	52.95		Very weak greyish brown SILTSTONE recovered as fine to coarse angular gravel. Slow progress at base.
						
			2.90	52.75		Trialpit Complete at 2.900m

Remarks: Pit terminated at 2.9m due to slow progress. Groundwater not encountered. Backfilled with arisings.

Stability: Stable.

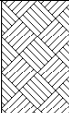






Project Name Manor Farm	Project No. 48417	Co-ords: 443044.00 - 407106.00 Level: 54.70	Date 30/08/2023
Location: Great Houghton, South Yorkshire		Dimensions: <span style="border: 1px solid black; padding: 2px 10px;">m</span>	Scale 1:20
Client: Avant Homes		Depth: 2.90m	Logged DN

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
0.10	ES					TOPSOIL: Dark brown slightly gravelly very clayey SAND. Gravel is fine to coarse angular of sandstone and rare coal fragments.
0.40	ES		0.35	54.35		Firm brown/greyish brown sandy CLAY.
			0.70	54.00		Firm light grey mottled orangish brown CLAY.
1.00		HVP=68				
1.40		HVP=81				
1.60	D		1.50	53.20		Extremely weak black COAL recovered as very sandy fine to medium angular gravel.
			1.90	52.80		Firm to stiff grey CLAY.
2.00		HVP=83				
			2.10	52.60		Extremely weak black COAL recovered as sandy fine to coarse angular gravel.
			2.30	52.40		Extremely weak grey SILTSTONE with frequent black carbonaceous inclusions, recovered as fine to coarse angular gravel.
			2.50	52.20		Extremely weak black COAL recovered as sandy fine to coarse angular gravel.
			2.70	52.00		Very weak grey SILTSTONE with frequent black carbonaceous inclusions (10mm elongated), recovered as sandy fine to coarse angular gravel with low cobble content. Slow progress at base.
			2.90	51.80		Trialpit Complete at 2.900m

Remarks: Pit terminated at 2.9m due to slow progress. Groundwater not encountered. Backfilled with arisings. HVP = Average hand shear vane reading in kN/m2.

Stability: Stable.








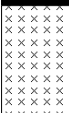
Project Name Manor Farm	Project No. 48417	Co-ords: 443035.00 - 407061.00 Level: 55.25	Date 30/08/2023
Location: Great Houghton, South Yorkshire		Dimensions: <span style="border: 1px solid black; display: inline-block; width: 100px; height: 20px; vertical-align: middle;"></span> m	Scale 1:20
Client: Avant Homes		Depth: 2.70m	Logged DN

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
0.10	ES		0.30	54.95		TOPSOIL: Dark brown slightly gravelly very clayey SAND. Gravel is fine to coarse angular of sandstone and rare coal and pot fragments.
						Stiff light grey mottled orangish brown closely fissured CLAY.
0.70		HVP=116				Grey mottled brown below 0.8m, and slightly gravelly (gravel is fine to coarse angular of mudstone lithorelicts).
0.90	ES					
0.90		HVP=150				
			1.40	53.85		Extremely weak black COAL recovered as very sandy fine to coarse angular gravel.
			1.85	53.40		Stiff grey/orangish brown CLAY.
			2.05	53.20		Extremely weak black COAL recovered as sandy fine to coarse angular gravel.
			2.25	53.00		Extremely weak grey SILTSTONE with frequent black carbonaceous inclusions, recovered as fine to coarse angular gravel.
			2.35	52.90		Extremely weak black COAL recovered as sandy fine to coarse angular gravel.
			2.55	52.70		Very weak grey SILTSTONE with frequent black carbonaceous inclusions (10mm elongated), recovered as sandy fine to coarse angular gravel with low cobble content.
			2.70	52.55		Slow progress at base.
Trialpit Complete at 2.700m						

Remarks: Pit terminated at 2.7m due to slow progress. Groundwater not encountered. Backfilled with arisings. HVP = Average hand shear vane reading in kN/m<sup>2</sup>.

Stability: Stable.












Project Name Manor Farm	Project No. 48417	Co-ords: 442999.00 - 407011.00 Level: 57.15	Date 31/08/2023
Location: Great Houghton, South Yorkshire		Dimensions: <span style="border: 1px solid black; padding: 2px 10px;">m</span>	Scale 1:20
Client: Avant Homes		Depth: <span style="border: 1px solid black; padding: 2px 10px;">E</span> 2.35m	Logged DN

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
0.10	ES	HVP=105	0.25	56.90		TOPSOIL: Dark brown slightly gravelly very clayey SAND. Gravel is fine to coarse angular of sandstone and rare coal.
0.40	ES					Stiff light grey mottled orangish brown CLAY.
0.90			0.95	56.20		Extremely weak black COAL recovered as very sandy fine to coarse angular gravel.
			1.30	55.85		Stiff grey mottled orangish brown CLAY.
			1.60	55.55		Extremely weak black COAL recovered as sandy fine to coarse angular gravel.
			1.80	55.35		Extremely weak grey SILTSTONE with frequent black carbonaceous inclusions, recovered as fine to coarse angular gravel.
			1.90	55.25		Extremely weak black COAL recovered as sandy fine to coarse angular gravel.
			2.05	55.10		Extremely weak grey SILTSTONE with frequent black carbonaceous inclusions (10mm elongated), recovered as sandy fine to coarse angular gravel with low cobble content. Slow progress at base.
		2.35	54.80			Trialpit Complete at 2.350m

Remarks: Pit terminated at 2.35m due to slow progress. Groundwater not encountered. Soakaway test (SA2) completed in pit. Backfilled with arisings. HVP = Average hand shear vane reading in kN/m2.

Stability: Stable.



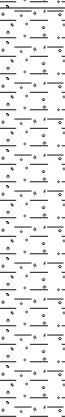

Project Name Manor Farm	Project No. 48417	Co-ords: 442985.00 - 407052.00 Level: 56.40	Date 31/08/2023
Location: Great Houghton, South Yorkshire		Dimensions: <span style="border: 1px solid black; display: inline-block; width: 100px; height: 20px; vertical-align: middle;"></span> m	Scale 1:20
Client: Avant Homes		Depth: 2.40m	Logged DN

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
0.10	ES		0.20	56.20		TOPSOIL: Dark brown slightly gravelly silty SAND. Gravel is fine to medium angular of mudstone.
			0.50	55.90		Brown silty fine to medium SAND.
			0.70			Stiff light grey mottled orangish brown CLAY.
						<i>Clay land drain encountered at 0.6m (dry).</i>
0.70 0.70 0.70	D	HVP=141 HVP=81	0.80	55.60		Stiff dark grey gravelly CLAY. Gravel is fine to coarse angular of coal. (Completely weathered coal)
1.00	D		1.25	55.15		Stiff grey mottled orangish brown CLAY.
1.30		HVP=97	1.50	54.90		Black COAL recovered as sandy fine to coarse angular gravel.
			1.75	54.65		Stiff grey mottled brown CLAY.
			1.85	54.55		Black COAL recovered as sandy fine to coarse angular gravel.
			2.00	54.40		Stiff grey mottled brown gravelly friable CLAY. Gravel is fine to medium angular of siltstone.
			2.20	54.20		Extremely weak grey SILTSTONE recovered as fine to coarse angular gravel.
			2.40	54.00		Trialpit Complete at 2.400m

Remarks: Pit terminated at 2.4m due to slow progress. Groundwater not encountered. Backfilled with arisings. HVP = Average hand shear vane reading in kN/m2.

Stability: Stable.


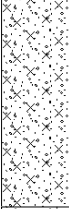
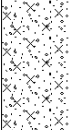
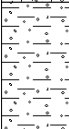
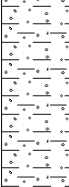

Project Name Manor Farm	Project No. 48417	Co-ords: 442945.00 - 407006.00 Level: 58.25	Date 31/08/2023
Location: Great Houghton, South Yorkshire		Dimensions: <span style="border: 1px solid black; padding: 2px;">                    </span> m	Scale 1:20
Client: Avant Homes		Depth: <span style="border: 1px solid black; padding: 2px;">                    </span> E <span style="border: 1px solid black; padding: 2px;">                    </span>	Logged DN
Depth: 2.30m			

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
0.10	ES					TOPSOIL: Brown slightly gravelly very clayey SAND. Gravel is fine to coarse angular of sandstone.
0.40	ES		0.30	57.95		Stiff light grey mottled orangish brown slightly gravelly CLAY. Gravel is fine to coarse angular of mudstone lithorelicts.
1.10 1.10	D	HVP=139	0.80	57.45		Stiff grey mottled brown slightly gravelly CLAY. Gravel is fine to coarse angular of siltstone.
			1.90	56.35		Extremely weak brown fine-grained SANDSTONE recovered as slightly sandy fine to coarse angular gravel. Slow progress at base.
			2.30	55.95		Trialpit Complete at 2.300m

Remarks: Pit terminated at 2.3m due to slow progress. Groundwater not encountered. Backfilled with arisings. HVP = Average hand shear vane reading in kN/m2.

Stability: Stable.

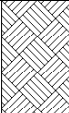

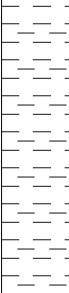



Project Name Manor Farm	Project No. 48417	Co-ords: 442924.00 - 406977.00 Level: 59.50	Date 31/08/2023
Location: Great Houghton, South Yorkshire		Dimensions: <span style="border: 1px solid black; display: inline-block; width: 100px; height: 20px; vertical-align: middle;"></span> m	Scale 1:20
Client: Avant Homes		Depth: 2.20m	Logged DN

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
0.10	ES		0.25	59.25		TOPSOIL: Brown slightly gravelly silty SAND. Gravel is fine to coarse angular of sandstone.
0.40	ES		0.80	58.70		Brown slightly gravelly very silty fine to medium SAND. Gravel is fine to coarse angular of sandstone.
1.30 1.30	D	HVP=81	1.15	58.35		Light brown silty very gravelly fine to medium SAND. Gravel is fine to coarse angular of sandstone.
			1.15	58.35		Stiff light grey mottled brown slightly gravelly closely fissured CLAY. Gravel is fine to coarse angular of mudstone and siltstone. Medium-grained sand occasionally noted on fissure surfaces. <i>Hand vane attempted at 1.3m - test recorded 81kPa before test lump failed.</i>
			2.00	57.50		Extremely weak greyish brown SILTSTONE with occasional mudstone interbeds, recovered as fine to coarse angular gravel.
			2.20	57.30		Trialpit Complete at 2.200m

Remarks: Pit terminated at 2.2m due to slow progress. Groundwater not encountered. Backfilled with arisings. HVP = Average hand shear vane reading in kN/m2.

Stability: Stable.

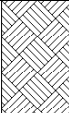
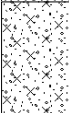
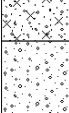
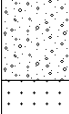
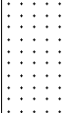
Project Name Manor Farm		Project No. 48417	Co-ords: 442970.00 - 406975.00 Level: 58.65	Date 31/08/2023
Location: Great Houghton, South Yorkshire			Dimensions: <span style="border: 1px solid black; padding: 2px 10px;">m</span>	Scale 1:20
Client: Avant Homes			Depth: <span style="border: 1px solid black; padding: 2px 10px;">E</span> 2.30m	Logged DN

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
0.10	ES		0.30	58.35		TOPSOIL: Dark brown slightly gravelly very clayey SAND. Gravel is fine to coarse angular of sandstone.
						Stiff light grey mottled orangish brown CLAY.
0.90 0.90	D	HVP=83	1.00	57.65		Stiff grey mottled brown CLAY.
1.20		HVP=110				<i>Slightly gravelly below 1.4m (gravel is fine to coarse angular of mudstone lithorelicts).</i>
			1.80	56.85		Very stiff grey/brown gravelly CLAY. Gravel is fine to coarse angular of mudstone lithorelicts.
			2.10	56.55		Extremely weak brown SILTSTONE recovered as sandy fine to coarse angular gravel. Slow progress at base.
			2.30	56.35		Trialpit Complete at 2.300m

Remarks: Pit terminated at 2.3m due to slow progress. Groundwater not encountered. Backfilled with arisings. HVP = Average hand shear vane reading in kN/m<sup>2</sup>.

Stability: Stable.

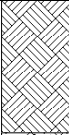

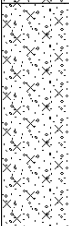
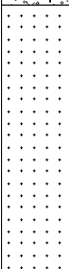
Project Name Manor Farm	Project No. 48417	Co-ords: 442950.00 - 406953.00 Level: 59.75	Date 31/08/2023
Location: Great Houghton, South Yorkshire		Dimensions: <span style="border: 1px solid black; display: inline-block; width: 100px; height: 20px; vertical-align: middle;"></span> m	Scale 1:20
Client: Avant Homes		Depth: 1.90m	Logged DN

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
0.10	ES					TOPSOIL: Dark brown slightly gravelly very silty SAND. Gravel is fine to coarse angular of sandstone.
0.40	ES		0.30	59.45		Brown slightly gravelly silty fine to medium SAND. Gravel is fine to coarse angular of sandstone.
			0.70	59.05		Light brown very sandy GRAVEL. Gravel is fine to coarse angular of sandstone.
			1.10	58.65		Very weak brown medium-grained SANDSTONE recovered as very sandy fine to coarse gravel. Slow progress at base.
			1.90	57.85		Trialpit Complete at 1.900m

Remarks: Pit terminated at 1.9m due to slow progress. Groundwater not encountered. Backfilled with arisings.

Stability: Stable.

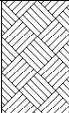

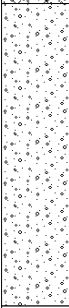
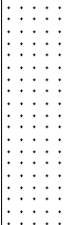

Project Name Manor Farm		Project No. 48417	Co-ords: 442909.00 - 406946.00 Level: 61.00	Date 31/08/2023
Location: Great Houghton, South Yorkshire			Dimensions: <span style="border: 1px solid black; display: inline-block; width: 100px; height: 20px; vertical-align: middle;"></span> m	Scale 1:20
Client: Avant Homes			Depth: 1.90m	Logged DN

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
0.10	ES					TOPSOIL: Brown silty gravelly SAND. Gravel is fine to coarse angular of sandstone and coal.
0.40	ES		0.35	60.65		Brown silty gravelly fine to medium SAND. Gravel is fine to coarse angular of sandstone.
			0.60	60.40		Light brown silty gravelly fine to medium SAND. Gravel is fine to coarse angular of sandstone.
			1.20	59.80		Extremely weak light brown medium-grained SANDSTONE recovered as very sandy fine to coarse gravel.
			1.90	59.10		Trialpit Complete at 1.900m

Remarks: Pit terminated at 1.9m due to slow progress. Groundwater not encountered. Soakaway test (SA3) completed in pit. Backfilled with arisings.

Stability: Stable.

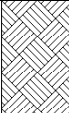
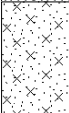


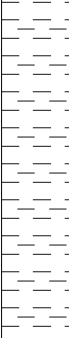
Project Name Manor Farm	Project No. 48417	Co-ords: 442929.00 - 406916.00 Level: 61.35	Date 31/08/2023
Location: Great Houghton, South Yorkshire		Dimensions: <span style="border: 1px solid black; display: inline-block; width: 100px; height: 20px; vertical-align: middle;"></span> m	Scale 1:20
Client: Avant Homes		Depth: 1.90m	Logged DN

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
0.10	ES					TOPSOIL: Dark brown slightly gravelly silty SAND. Gravel is fine to coarse angular of sandstone.
0.40	ES		0.30	61.05		Brown slightly gravelly silty fine to medium SAND. Gravel is fine to coarse angular of sandstone.
			0.50	60.85		Light brown very sandy GRAVEL. Gravel is fine to coarse angular of sandstone.
			1.30	60.05		Very weak brown medium-grained SANDSTONE recovered as very sandy fine to coarse gravel. Slow progress at base.
			1.90	59.45		Trialpit Complete at 1.900m

Remarks: Pit terminated at 1.9m due to slow progress. Groundwater not encountered. Backfilled with arisings.

Stability: Stable.

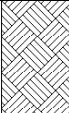
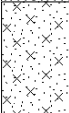
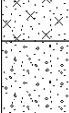
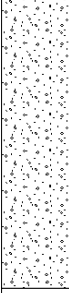
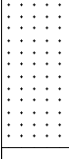
Project Name Manor Farm	Project No. 48417	Co-ords: 442950.00 - 406977.00 Level: 58.95	Date 31/08/2023
Location: Great Houghton, South Yorkshire		Dimensions: <input type="text"/> m	Scale 1:20
Client: Avant Homes		Depth: 2.20m	Logged DN

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
0.10	ES					TOPSOIL: Dark brown slightly gravelly very silty SAND. Gravel is fine to coarse angular of sandstone.
			0.30	58.65		Brown very silty fine to medium SAND.
			0.60	58.35		Stiff light grey mottled orangish brown closely fissured CLAY.
0.90		HVP=93				
			1.30	57.65		Stiff grey mottled brown CLAY.
1.50	D					
			2.20	56.75		Trialpit Complete at 2.200m

Remarks: Pit terminated at 2.2m due to slow progress. Groundwater not encountered. Backfilled with arisings. HVP = Average hand shear vane reading in kN/m2.

Stability: Stable.




Project Name Manor Farm	Project No. 48417	Co-ords: 442898.00 - 406985.00 Level: 59.90	Date 31/08/2023
Location: Great Houghton, South Yorkshire		Dimensions: <span style="border: 1px solid black; padding: 2px 10px;">m</span>	Scale 1:20
Client: Avant Homes		Depth: <span style="border: 1px solid black; padding: 2px 10px;">E</span> 2.05m	Logged DN

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
0.10	ES					TOPSOIL: Dark brown slightly gravelly very silty SAND. Gravel is fine to coarse angular of sandstone and rare coal.
			0.30	59.60		Brown silty fine to medium SAND.
			0.70	59.20		Light brown very gravelly fine to medium SAND. Gravel is fine to coarse angular of sandstone.
			1.65	58.25		Extremely weak light brown medium-grained SANDSTONE recovered as very sandy fine to coarse angular gravel. Slow progress at base.
			2.05	57.85		Trialpit Complete at 2.050m

Remarks: Pit terminated at 2.05m due to slow progress. Groundwater not encountered. Backfilled with arisings.

Stability: Stable.

Project Name Manor Farm	Project No. 48417	Co-ords: 442858.00 - 406929.00 Level: 62.10	Date 31/08/2023
Location: Great Houghton, South Yorkshire		Dimensions: <span style="border: 1px solid black; display: inline-block; width: 100px; height: 20px; vertical-align: middle;"></span> m	Scale 1:20
Client: Avant Homes		Depth: 1.00m	Logged DN

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
0.10	ES		0.25	61.85		MADE GROUND: COBBLES of bricks with much dark brown very sandy gravel. Gravel is fine to coarse angular of concrete and brick fragments. Occasional plastic and timber.
0.30	ES					Brown silty fine to medium SAND.
			0.50	61.60		Light brown very gravelly fine to medium SAND. Gravel is fine to coarse angular of sandstone.
			1.00	61.10		Trialpit Complete at 1.000m

Remarks: Pit complete at 1.0m. Groundwater not encountered. Backfilled with arisings.

Stability: Stable.

Project Name Manor Farm		Project No. 48417	Co-ords: 443003E - 407122N	Hole Type RO
Location: Great Houghton, South Yorkshire			Level: 55.35	Scale 1:35
Client: Avant Homes			Dates: 31/08/2023	Logged By Drillers

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.40	54.95	Soil.	
							Clay.	
					1.50	53.85	Coal.	
					2.20	53.15	Mudstone.	
				6.00	49.35		End of Borehole at 6.000m	



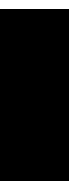
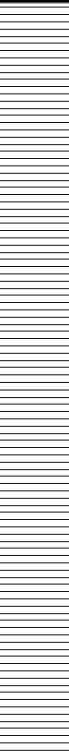
**Remarks**  
 Rotary borehole drilled using open-hole methods, complete at 6 m. Groundwater not encountered. Monitoring well installed as detailed above.

Project Name Manor Farm		Project No. 48417	Co-ords: 443029E - 407103N	Hole Type RO
Location: Great Houghton, South Yorkshire			Level: 54.75	Scale 1:35
Client: Avant Homes			Dates: 31/08/2023	Logged By Drillers

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.40	54.35	Soil.		
									Clay.
					1.50	53.25	Coal.		
					2.30	52.45	Mudstone.		
					6.00	48.75	End of Borehole at 6.000m		
		Type	Results						

**Remarks**  
 Rotary borehole drilled using open-hole methods, complete at 6 m. Groundwater not encountered. Monitoring well installed as detailed above.

Project Name Manor Farm		Project No. 48417	Co-ords: 443051E - 407111N	Hole Type RO
Location: Great Houghton, South Yorkshire			Level: 54.75	Scale 1:35
Client: Avant Homes			Dates: 31/08/2023	Logged By Drillers

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.40	54.35		Soil.	
								Clay.	1
					1.70	53.05		Coal.	2
					2.50	52.25		Mudstone.	3 4 5
					6.00	48.75		End of Borehole at 6.000m	6
		Type	Results						

Remarks  
Rotary borehole drilled using open-hole methods, complete at 6 m. Groundwater not encountered. Monitoring well installed as detailed above.



Entrance to farm yard from High Street



View south across the farm yard

<b>Job No.</b>	48417	<b>Prepared</b>	DN	<b>Checked</b>	KE	<b>Date</b>	30-31.08.2023	<b>Photograph Number</b>	1 & 2
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**AVANT HOMES**

**MANOR FARM, GREAT HOUGHTON**

**SITE INVESTIGATION PHOTOGRAPHS**

**Eastwood**  
CONSULTING ENGINEERS

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Old shed in north of farm yard



Old shed in south of farm yard

<b>Job No.</b>	48417	<b>Prepared</b>	DN	<b>Checked</b>	KE	<b>Date</b>	30-31.08.2023	<b>Photograph Number</b>	<b>3 &amp; 4</b>
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Old silos in south of farm yard



View north across western field from farm yard

<b>Job No.</b>	48417	<b>Prepared</b>	DN	<b>Checked</b>	KE	<b>Date</b>	30-31.08.2023	<b>Photograph Number</b>	<b>5 &amp; 6</b>
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Trees and bushes along western site boundary



View south across western field

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View towards northern boundary of western field



Entrance from farm yard into eastern field

<b>Job No.</b>	48417	<b>Prepared</b>	DN	<b>Checked</b>	KE	<b>Date</b>	30-31.08.2023	<b>Photograph Number</b>	<b>9 &amp; 10</b>
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View south across eastern field



Southern boundary of eastern field

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View across northern half of eastern field



View towards northern boundary of eastern field

<b>Job No.</b>	48417	<b>Prepared</b>	DN	<b>Checked</b>	KE	<b>Date</b>	30-31.08.2023	<b>Photograph Number</b>	13 & 14
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**AVANT HOMES**  
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TP01



TP02

<b>Job No.</b>	48417	<b>Prepared</b>	DN	<b>Checked</b>	KE	<b>Date</b>	30-31.08.2023	<b>Photograph Number</b>	15 & 16
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**AVANT HOMES**

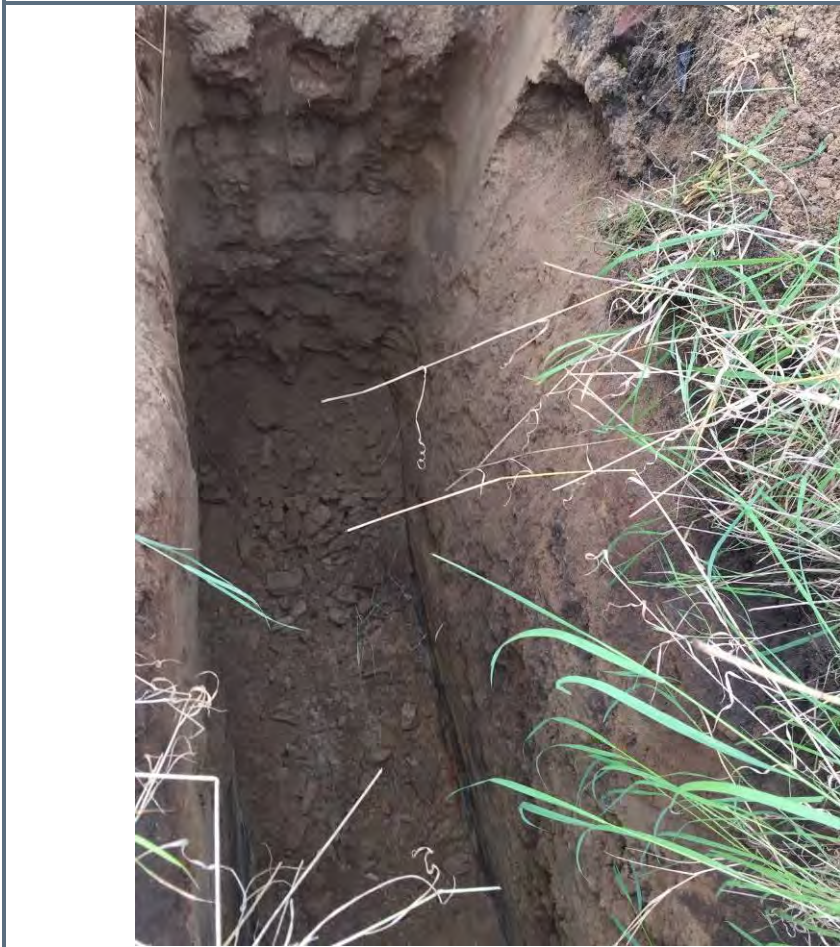
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TP03



TP04

<b>Job No.</b>	48417	<b>Prepared</b>	DN	<b>Checked</b>	KE	<b>Date</b>	30-31.08.2023	<b>Photograph Number</b>	17 & 18
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TP07



TP10

<b>Job No.</b>	48417	<b>Prepared</b>	DN	<b>Checked</b>	KE	<b>Date</b>	30-31.08.2023	<b>Photograph Number</b>	19 & 20
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**AVANT HOMES**

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TP11



TP13

<b>Job No.</b>	48417	<b>Prepared</b>	DN	<b>Checked</b>	KE	<b>Date</b>	30-31.08.2023	<b>Photograph Number</b>	21 & 22
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TP15



TP17

<b>Job No.</b>	48417	<b>Prepared</b>	DN	<b>Checked</b>	KE	<b>Date</b>	30-31.08.2023	<b>Photograph Number</b>	23 & 24
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TP19



TP21

<b>Job No.</b>	48417	<b>Prepared</b>	DN	<b>Checked</b>	KE	<b>Date</b>	30-31.08.2023	<b>Photograph Number</b>	25 & 26
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## Appendix 4

Calculation of Infiltration Rates  
Geotechnical Test Results, PSL23/7568









# LABORATORY REPORT



**Contract Number: PSL23/7568**

Report Date: 19 September 2023  
Client's Reference: 48417  
Client Name: Eastwood Consulting Engineers  
St Andrews House  
23 Kingfield Road  
Sheffield  
S11 9AS

**For the attention of: Daniel Nowell**

Project Name: Manor Farm, Great Houghton

Date Received: 7/9/2023  
Date Commenced: 7/9/2023  
Date Completed: 19/9/2023

**Notes: Opinions and Interpretations are outside the UKAS Accreditation**

A copy of the Laboratory Schedule of accredited tests as issued by UKAS is attached to this report. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced other than in full, without the prior written approval of the laboratory.

Checked and Approved Signatories:

A Watkins  
(Director)

R Berriman  
(Quality Manager)

S Royle  
(Laboratory Manager)

L Knight  
(Assistant Laboratory Manager)

S Eyre  
(Senior Technician)

  
M Fennell  
(Senior Technician)

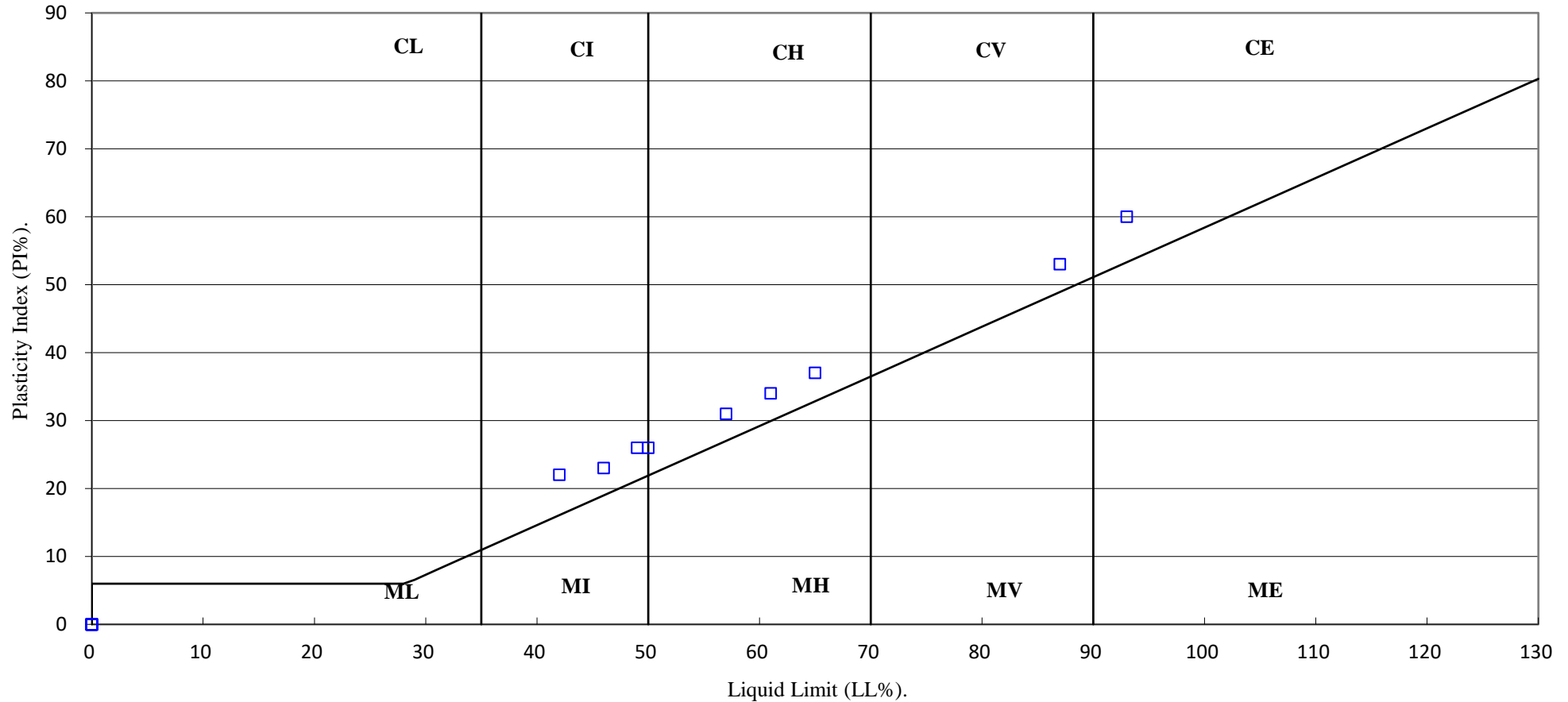
5 – 7 Hexthorpe Road,  
Hexthorpe,  
Doncaster,  
DN4 0AR  
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# PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.



Manor Farm, Great Houghton

Contract No:

PSL23/7568

Client Ref:

48417

## **Appendix 5**

Chemical Test Results, i2 Analytical Report 23-54567-1  
Table of Assessment Values – Residential with Home-grown Produce



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## Analytical Report Number : 23-54567

Project / Site name:	Manor Farm, Great Houghton	Samples received on:	04/09/2023
Your job number:	48417	Samples instructed on/ Analysis started on:	04/09/2023
Your order number:		Analysis completed by:	11/09/2023
Report Issue Number:	1	Report issued on:	11/09/2023
Samples Analysed:	31 soil samples		

Signed: \_\_\_\_\_

Dominika Liana  
Junior Reporting Specialist  
For & on behalf of i2 Analytical Ltd.

**Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.**

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting  
leachates - 2 weeks from reporting  
waters - 2 weeks from reporting  
asbestos - 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 23-54567  
Project / Site name: Manor Farm, Great Houghton

Lab Sample Number				2800421	2800422	2800423	2800424	2800425
Sample Reference				TP01	TP01	TP02	TP03	TP03
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10	0.60	0.10	0.10	0.50
Date Sampled				30/08/2023	30/08/2023	30/08/2023	30/08/2023	30/08/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	9	11	7.6	13	8.5
Total mass of sample received	kg	0.001	NONE	0.8	0.3	0.8	0.8	0.3

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	-	Not-detected	Not-detected	-
Asbestos Analyst ID	N/A	N/A	N/A	IZJ	N/A	IZJ	IZJ	N/A

#### General Inorganics

pH - Automated	pH Units	N/A	MCERTS	6.4	6.7	9.2	7.4	7.7
Total Sulphate as SO4	mg/kg	50	MCERTS	-	-	-	-	-
Total Sulphate as SO4	%	0.005	MCERTS	0.078	0.038	0.098	-	0.01
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0598	0.0797	0.0149	-	0.0024
Total Sulphur	mg/kg	50	MCERTS	-	-	-	-	-
Total Sulphur	%	0.005	MCERTS	0.048	0.013	0.048	-	0.005
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	1.8	-	1.4	1.4	-

#### Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	0.08	< 0.05	0.09	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.18	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.1	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.08	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.4	< 0.05	1.5	0.12	< 0.05
Anthracene	mg/kg	0.05	MCERTS	0.08	< 0.05	0.42	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	0.99	0.13	7.3	0.22	< 0.05
Pyrene	mg/kg	0.05	MCERTS	0.99	0.13	7.3	0.23	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.7	0.11	5	0.13	< 0.05
Chrysene	mg/kg	0.05	MCERTS	0.67	0.11	4.4	0.13	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	1	0.14	7.2	0.15	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	0.39	0.08	2.9	0.08	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.83	0.13	6.5	0.12	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.5	0.08	3.8	0.07	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.11	< 0.05	0.83	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.61	0.11	4.7	0.08	< 0.05

#### Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	7.38	1.02	52.2	1.33	< 0.80
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#### Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	25	7.5	11	10	5.5
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	14	10	56	14	11
Copper (aqua regia extractable)	mg/kg	1	MCERTS	65	16	25	19	18
Lead (aqua regia extractable)	mg/kg	1	MCERTS	60	20	43	32	9.6
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	21	14	15	15	23
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	130	39	78	61	32

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number: 23-54567  
Project / Site name: Manor Farm, Great Houghton

Lab Sample Number	2800426			2800427			2800428			2800429			2800430		
Sample Reference	TP05			TP05			TP06			TP07			TP08		
Sample Number	None Supplied			None Supplied			None Supplied			None Supplied			None Supplied		
Depth (m)	0.10			0.40			0.10			0.10			0.10		
Date Sampled	30/08/2023			30/08/2023			30/08/2023			30/08/2023			30/08/2023		
Time Taken	None Supplied			None Supplied			None Supplied			None Supplied			None Supplied		
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status												
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	
Moisture Content	%	0.01	NONE	21	17	19	19	19	19	19	19	19	19	21	
Total mass of sample received	kg	0.001	NONE	0.8	0.3	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	-	Not-detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	IZJ	N/A	IZJ	IZJ	IZJ

#### General Inorganics

pH - Automated	pH Units	N/A	MCERTS	6.8	7.4	7.1	7.1	7.4
Total Sulphate as SO4	mg/kg	50	MCERTS	-	-	-	-	-
Total Sulphate as SO4	%	0.005	MCERTS	-	0.04	-	-	-
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	0.0583	-	-	-
Total Sulphur	mg/kg	50	MCERTS	-	-	-	-	-
Total Sulphur	%	0.005	MCERTS	-	0.018	-	-	-
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	2.8	-	-	-	2.4

#### Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.1	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.13	< 0.05	0.08	0.36	0.14
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.06	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	0.3	< 0.05	0.14	0.81	0.27
Pyrene	mg/kg	0.05	MCERTS	0.31	< 0.05	0.15	0.73	0.28
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.17	< 0.05	0.06	0.4	0.15
Chrysene	mg/kg	0.05	MCERTS	0.2	< 0.05	0.09	0.49	0.15
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	0.26	< 0.05	0.13	0.61	0.18
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	0.08	< 0.05	< 0.05	0.16	0.1
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.18	< 0.05	0.08	0.38	0.13
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.11	< 0.05	< 0.05	0.24	0.07
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.13	< 0.05	< 0.05	0.25	0.07

#### Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	1.87	< 0.80	< 0.80	4.59	1.54
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#### Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	13	15	13	26	15
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	20	27	19	22	21
Copper (aqua regia extractable)	mg/kg	1	MCERTS	22	23	22	37	22
Lead (aqua regia extractable)	mg/kg	1	MCERTS	46	19	43	64	41
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	15	17	13	19	14
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	71	62	63	120	62

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number: 23-54567  
Project / Site name: Manor Farm, Great Houghton

Lab Sample Number	2800431		2800432		2800433		2800434		2800435	
Sample Reference	TP08		TP09		TP10		TP11		TP11	
Sample Number	None Supplied		None Supplied		None Supplied		None Supplied		None Supplied	
Depth (m)	0.40		0.10		0.10		0.10		0.50	
Date Sampled	30/08/2023		30/08/2023		30/08/2023		30/08/2023		30/08/2023	
Time Taken	None Supplied		None Supplied		None Supplied		None Supplied		None Supplied	
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status							
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	15	22	19	19	19	23	23
Total mass of sample received	kg	0.001	NONE	0.3	0.8	0.8	0.7	0.7	0.8	0.8

Asbestos in Soil	Type	N/A	ISO 17025	-	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	N/A	IZJ	IZJ	IZJ	MJN

#### General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7	7.6	7.3	7.2	7.2
Total Sulphate as SO4	mg/kg	50	MCERTS	-	-	-	-	-
Total Sulphate as SO4	%	0.005	MCERTS	0.042	-	-	0.039	0.04
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.07	-	-	0.0226	0.0256
Total Sulphur	mg/kg	50	MCERTS	-	-	-	-	-
Total Sulphur	%	0.005	MCERTS	0.025	-	-	0.033	0.035
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	-	-	2.3	-	2.1

#### Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	0.12	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	0.09	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	0.67	0.09	< 0.05	0.06
Anthracene	mg/kg	0.05	MCERTS	< 0.05	0.13	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	1.6	0.13	< 0.05	0.14
Pyrene	mg/kg	0.05	MCERTS	< 0.05	1.4	0.15	< 0.05	0.13
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	0.79	0.07	< 0.05	0.1
Chrysene	mg/kg	0.05	MCERTS	< 0.05	0.9	0.1	< 0.05	0.08
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05	1.2	0.15	< 0.05	0.12
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05	0.35	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.81	0.09	< 0.05	0.08
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.44	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	0.1	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	0.55	< 0.05	< 0.05	< 0.05

#### Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	< 0.80	9.17	< 0.80	< 0.80	< 0.80
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#### Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	12	29	15	18	18
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	28	25	20	33	24
Copper (aqua regia extractable)	mg/kg	1	MCERTS	24	47	23	33	29
Lead (aqua regia extractable)	mg/kg	1	MCERTS	22	72	44	38	42
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	20	25	13	25	17
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	72	150	57	77	76

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number: 23-54567  
Project / Site name: Manor Farm, Great Houghton

Lab Sample Number	2800436		2800437		2800438		2800439		2800440	
Sample Reference	TP12		TP12		TP12		TP13		TP14	
Sample Number	None Supplied		None Supplied		None Supplied		None Supplied		None Supplied	
Depth (m)	0.10		0.40		1.60		0.10		0.10	
Date Sampled	30/08/2023		30/08/2023		30/08/2023		31/08/2023		31/08/2023	
Time Taken	None Supplied		None Supplied		None Supplied		None Supplied		None Supplied	
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status							
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	14	16	13	13	13	17	17
Total mass of sample received	kg	0.001	NONE	0.8	0.3	0.4	0.8	0.8	0.8	0.8

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	-	-	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	MJN	N/A	N/A	MJN	MJN

#### General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.2	7.7	4.4	7.5	7.3
Total Sulphate as SO4	mg/kg	50	MCERTS	-	-	1400	-	-
Total Sulphate as SO4	%	0.005	MCERTS	-	0.032	-	-	-
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	0.0431	0.0979	-	-
Total Sulphur	mg/kg	50	MCERTS	-	-	2300	-	-
Total Sulphur	%	0.005	MCERTS	-	0.02	-	-	-
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	2.7	-	-	-	3

#### Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	0.3
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.06	< 0.05	-	0.05	0.19
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	0.14	< 0.05	-	0.09	0.19
Pyrene	mg/kg	0.05	MCERTS	0.14	< 0.05	-	0.08	0.2
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.07	< 0.05	-	0.06	0.12
Chrysene	mg/kg	0.05	MCERTS	0.11	< 0.05	-	0.09	0.14
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	0.13	< 0.05	-	< 0.05	0.16
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05	< 0.05	-	< 0.05	0.07
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.08	< 0.05	-	< 0.05	0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	< 0.05

#### Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	< 0.80	< 0.80	-	< 0.80	1.47
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#### Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	18	8.2	-	12	14
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	-	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	23	17	-	17	19
Copper (aqua regia extractable)	mg/kg	1	MCERTS	30	19	-	38	27
Lead (aqua regia extractable)	mg/kg	1	MCERTS	58	15	-	54	69
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	18	11	-	15	17
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	-	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	100	37	-	65	76

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number: 23-54567  
Project / Site name: Manor Farm, Great Houghton

Lab Sample Number	2800441		2800442		2800443		2800444		2800445	
Sample Reference	TP14		TP15		TP16		TP16		TP18	
Sample Number	None Supplied		None Supplied		None Supplied		None Supplied		None Supplied	
Depth (m)	0.40		0.10		0.10		0.40		0.10	
Date Sampled	31/08/2023		31/08/2023		31/08/2023		31/08/2023		31/08/2023	
Time Taken	None Supplied		None Supplied		None Supplied		None Supplied		None Supplied	
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status							
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	21	14	11	13	12		
Total mass of sample received	kg	0.001	NONE	0.3	0.8	0.7	0.3	0.8		

Asbestos in Soil	Type	N/A	ISO 17025	-	Not-detected	Not-detected	-	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	N/A	MJN	MJN	N/A	MJN

#### General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7	7	7.1	7.9	7.6
Total Sulphate as SO4	mg/kg	50	MCERTS	-	-	-	-	-
Total Sulphate as SO4	%	0.005	MCERTS	0.037	-	-	0.019	-
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0447	-	-	0.0381	-
Total Sulphur	mg/kg	50	MCERTS	-	-	-	-	-
Total Sulphur	%	0.005	MCERTS	0.017	-	-	0.012	-
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	-	-	0.2	-	-

#### Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	0.08	< 0.05	< 0.05	0.11
Anthracene	mg/kg	0.05	MCERTS	< 0.05	0.16	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.25	< 0.05	< 0.05	0.12
Pyrene	mg/kg	0.05	MCERTS	< 0.05	0.37	< 0.05	< 0.05	0.11
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	0.12	< 0.05	< 0.05	0.07
Chrysene	mg/kg	0.05	MCERTS	< 0.05	0.25	< 0.05	< 0.05	0.09
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05	0.47	< 0.05	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05	0.11	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.29	< 0.05	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.1	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	0.1	< 0.05	< 0.05	< 0.05

#### Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	< 0.80	2.3	< 0.80	< 0.80	< 0.80
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#### Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	7.6	13	11	4.5	11
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	34	18	26	29	14
Copper (aqua regia extractable)	mg/kg	1	MCERTS	25	25	38	25	24
Lead (aqua regia extractable)	mg/kg	1	MCERTS	16	45	18	14	70
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	28	13	26	28	12
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	68	70	81	76	67

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number: 23-54567  
Project / Site name: Manor Farm, Great Houghton

Lab Sample Number				2800446	2800447	2800448	2800449	2800450
Sample Reference				TP19	TP20	TP21	TP21	TP23
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10	0.10	0.10	0.40	0.10
Date Sampled				31/08/2023	31/08/2023	31/08/2023	31/08/2023	31/08/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	9.6	9.6	9	7.9	9.7
Total mass of sample received	kg	0.001	NONE	0.7	0.8	0.8	0.3	0.7

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	-	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	MJN	MJN	MJN	N/A	PDO

#### General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.3	6.8	7.3	7.9	7.6
Total Sulphate as SO4	mg/kg	50	MCERTS	-	-	-	-	-
Total Sulphate as SO4	%	0.005	MCERTS	-	-	-	0.014	-
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	-	-	0.0035	-
Total Sulphur	mg/kg	50	MCERTS	-	-	-	-	-
Total Sulphur	%	0.005	MCERTS	-	-	-	0.007	-
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	-	-	2.3	-	-

#### Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	0.1	0.7	< 0.05	0.17
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.15	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	0.11	0.18	1.2	< 0.05	0.62
Pyrene	mg/kg	0.05	MCERTS	0.1	0.18	1.1	< 0.05	0.64
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.08	0.09	0.53	< 0.05	0.36
Chrysene	mg/kg	0.05	MCERTS	0.09	0.11	0.62	< 0.05	0.47
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	0.1	0.15	0.72	< 0.05	0.61
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	0.05	0.07	0.36	< 0.05	0.3
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.06	< 0.05	0.59	< 0.05	0.48
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.08	0.33	< 0.05	0.29
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.09	< 0.05	0.07
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	0.09	0.39	< 0.05	0.35

#### Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	< 0.80	1.05	6.74	< 0.80	4.36
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#### Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	11	9.1	11	4.1	13
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	13	13	15	9.6	18
Copper (aqua regia extractable)	mg/kg	1	MCERTS	22	22	24	12	25
Lead (aqua regia extractable)	mg/kg	1	MCERTS	60	39	59	11	46
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	12	14	13	14	15
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	62	60	71	34	72

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number: 23-54567  
Project / Site name: Manor Farm, Great Houghton

Lab Sample Number	2800451			
Sample Reference	TP24			
Sample Number	None Supplied			
Depth (m)	0.10			
Date Sampled	31/08/2023			
Time Taken	None Supplied			
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status	
Stone Content	%	0.1	NONE	26
Moisture Content	%	0.01	NONE	5.8
Total mass of sample received	kg	0.001	NONE	0.7

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	PDO

#### General Inorganics

pH - Automated	pH Units	N/A	MCERTS	9.1
Total Sulphate as SO4	mg/kg	50	MCERTS	-
Total Sulphate as SO4	%	0.005	MCERTS	0.156
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.089
Total Sulphur	mg/kg	50	MCERTS	-
Total Sulphur	%	0.005	MCERTS	0.148
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	-

#### Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	0.49
Acenaphthylene	mg/kg	0.05	MCERTS	0.79
Acenaphthene	mg/kg	0.05	MCERTS	1.8
Fluorene	mg/kg	0.05	MCERTS	1.7
Phenanthrene	mg/kg	0.05	MCERTS	25
Anthracene	mg/kg	0.05	MCERTS	7.1
Fluoranthene	mg/kg	0.05	MCERTS	51
Pyrene	mg/kg	0.05	MCERTS	46
Benzo(a)anthracene	mg/kg	0.05	MCERTS	27
Chrysene	mg/kg	0.05	MCERTS	25
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	37
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	14
Benzo(a)pyrene	mg/kg	0.05	MCERTS	29
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	17
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	4.9
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	20

#### Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	308
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#### Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	11
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	80
Copper (aqua regia extractable)	mg/kg	1	MCERTS	30
Lead (aqua regia extractable)	mg/kg	1	MCERTS	74
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	13
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	77

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number : 23-54567

Project / Site name: Manor Farm, Great Houghton

\* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2800421	TP01	None Supplied	0.1	Brown clay and sand with gravel.
2800422	TP01	None Supplied	0.6	Brown clay and sand with gravel.
2800423	TP02	None Supplied	0.1	Brown clay and sand with gravel and vegetation.
2800424	TP03	None Supplied	0.1	Brown clay and sand with gravel and vegetation.
2800425	TP03	None Supplied	0.5	Brown clay and sand with gravel.
2800426	TP05	None Supplied	0.1	Brown clay and loam with gravel and vegetation.
2800427	TP05	None Supplied	0.4	Brown clay and sand with gravel.
2800428	TP06	None Supplied	0.1	Brown clay and sand with gravel and vegetation.
2800429	TP07	None Supplied	0.1	Brown clay and sand with gravel and vegetation.
2800430	TP08	None Supplied	0.1	Brown clay and sand with gravel and vegetation.
2800431	TP08	None Supplied	0.4	Brown clay and sand with gravel.
2800432	TP09	None Supplied	0.1	Brown clay and sand with gravel and vegetation.
2800433	TP10	None Supplied	0.1	Brown clay and sand with gravel and vegetation.
2800434	TP11	None Supplied	0.1	Brown clay and sand with gravel.
2800435	TP11	None Supplied	0.5	Brown clay and sand with gravel.
2800436	TP12	None Supplied	0.1	Brown clay and sand with gravel.
2800437	TP12	None Supplied	0.4	Brown clay.
2800438	TP12	None Supplied	1.6	Brown gravelly sand.
2800439	TP13	None Supplied	0.1	Brown loam and sand with vegetation.
2800440	TP14	None Supplied	0.1	Brown loam and sand with vegetation.
2800441	TP14	None Supplied	0.4	Brown clay.
2800442	TP15	None Supplied	0.1	Brown loam and sand with vegetation.
2800443	TP16	None Supplied	0.1	Brown clay.
2800444	TP16	None Supplied	0.4	Brown clay.
2800445	TP18	None Supplied	0.1	Brown loam and sand with gravel and vegetation.
2800446	TP19	None Supplied	0.1	Brown loam and sand with gravel and vegetation.
2800447	TP20	None Supplied	0.1	Brown loam and sand with gravel and vegetation.
2800448	TP21	None Supplied	0.1	Brown loam and sand with gravel and vegetation.
2800449	TP21	None Supplied	0.4	Brown sand with gravel.
2800450	TP23	None Supplied	0.1	Brown loam and sand with gravel and vegetation.
2800451	TP24	None Supplied	0.1	Brown loam and sand with stones and vegetation.

Analytical Report Number : 23-54567

Project / Site name: Manor Farm, Great Houghton

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Total Sulphate in soil as %	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Total Sulphur in soil as %	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS

For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).

For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).

For method numbers ending in 'PL or B' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.


Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Inorganic Compounds	Human Health - Residential with Homegrown Produce (mg/kg)
Arsenic	37
Cadmium	11
Chromium (III)	910
Chromium (VI)	6
Lead	200
Mercury	1.2
Nickel	180
Selenium	250
Copper	2400
Zinc	3700

Organic Compounds	Human Health - Residential with Homegrown Produce (mg/kg)		
	1% SOM	2.5% SOM	6% SOM
Naphthalene	2.3	5.6	13
Acenaphthene	210	510	1100
Acenaphthylene	170	420	920
Fluorene	170	400	860
Phenanthrene	95	220	440
Anthracene	2400	5400	11000
Fluoranthene	280	560	890
Pyrene	620	1200	2000
Benzo(a)anthracene	7.2	11	13
Chrysene	15	22	27
Benzo(b)fluoranthene	2.6	3.3	3.7
Benzo(k)fluoranthene	77	93	100
Benzo(a)pyrene	2.2	2.7	3.0
Dibenz(a,h)anthracene	0.24	0.28	0.3
Indeno(1,2,3-cd)pyrene	27	36	41
Benzo(g,h,i)perylene	320	340	350
Benzene	0.087	0.17	0.37
Toluene	130	290	660
Ethylbenzene	47	110	260
o-Xylene	60	140	330
m-Xylene	59	140	320
p-Xylene	56	130	310

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Prepared	LM	Checked	KE	Date	13.03.24	Job No	48417
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 <p><b>Eastwood</b> CONSULTING ENGINEERS</p> <p>St Andrew's House 23 Kingfield Road Sheffield S11 9AS</p> <p>Tel: (0114) 255 4554 Fax: (0114) 255 4330</p>	<p><b>MANOR FARM, GREAT HOUGHTON</b></p> <p><b>AVANT HOMES</b></p> <p><b>ASSESSMENT CRITERIA – RESIDENTIAL WITH HOMEGROWN PRODUCE</b></p>
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Contaminant	Phytotoxicity			
	pH	pH	pH	pH
	5.0 to 5.5	5.5 to 6.0	6.0 to 7.0	>7.0
Arsenic	50			
Cadmium	3			
Chromium	400			
Lead	300			
Mercury	1			
Nickel	50	60	75	110
Copper	80	100	135	200
Zinc	200	200	200	300


The assessment concentration for lead is the Category 4 Screening Level produced by Contaminated Land: Applications in Real Environments (CL:AIRE) and outlined in Appendix H of their report SP1010. The others have been taken from Nathanail, C. P., McCaffrey, C., Gillett, A., Ogden, R., and Nathanail, J., 2015, 'The LQM/CIEH S4ULs for Human Health Risk Assessment', Land Quality Press, Nottingham. The metals/metalloids are based on a sandy loam soil and 6% soil organic matter. The assessment values are not intended to be applied to individual sample results where materials are similar, as the levels of contaminants will have a natural variability across the site. Instead, the modified mean value should be compared with the assessment concentration.

The assessment values for phytotoxicity are the levels at which plant growth is thought to be affected. They are taken from the maximum permissible and advisable concentrations in soil after application of soil sludge given in the 'The Code of Good Agricultural Practice for the Protection of Soil', MAFF, 1998.

The assessment of sulphate, water soluble sulphate, elemental sulphur and sulphide is to determine the aggressive nature of the ground with respect to concrete and consequently the results are compared with BRE Special Digest 1:2005 'Concrete in Aggressive Ground'.

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<b>Prepared</b>	LM	<b>Checked</b>	KE	<b>Date</b>	13.03.24	<b>Job No</b>	48417
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 <p><b>Eastwood</b> CONSULTING ENGINEERS</p> <p>St Andrew's House 23 Kingfield Road Sheffield S11 9AS</p> <p>Tel: (0114) 255 4554 Fax: (0114) 255 4330</p>	<p><b>MANOR FARM, GREAT HOUGHTON</b></p> <p><b>AVANT HOMES</b></p> <p><b>ASSESSMENT CRITERIA – RESIDENTIAL WITH HOMEGROWN PRODUCE</b></p>
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TPH Fraction	Intended Land Use Residential (mg/kg)		
	1% SOM	2.5% SOM	6% SOM
Aliphatic EC 5-6	42	78	160
Aliphatic EC >6-8	100	230	530
Aliphatic EC >8-10	27	65	150
Aliphatic EC >10-12	130 (48) <sup>vap</sup>	330 (118) <sup>vap</sup>	760 (283) <sup>vap</sup>
Aliphatic EC >12-16	1100 (24) <sup>sol</sup>	2400 (59) <sup>sol</sup>	4,300 (142) <sup>sol</sup>
Aliphatic EC >16-35	65,000 (8.48) <sup>f, sol</sup>	92,000 (21) <sup>f, sol</sup>	110,000 <sup>f</sup>
Aliphatic EC >35-44	65,000 (8.48) <sup>f, sol</sup>	92,000 (21) <sup>f, sol</sup>	110,000 <sup>f</sup>
Aromatic EC 5-7	70	140	300
Aromatic EC >7-8	130	290	660
Aromatic EC >8-10	34	83	190
Aromatic EC >10-12	74	180	380
Aromatic EC >12-16	140	330	660
Aromatic EC >16-21	260 <sup>f</sup>	540 <sup>f</sup>	930 <sup>f</sup>
Aromatic EC >21-35	1,100 <sup>f</sup>	1,500 <sup>f</sup>	1,700 <sup>f</sup>
Aromatic EC >35-44	1,100 <sup>f</sup>	1,500 <sup>f</sup>	1,700 <sup>f</sup>

<sup>f</sup> oral, dermal, and inhalation exposure compared with oral HCV

<sup>sol</sup> S4UL presented exceeds the solubility saturation limit, which is presented in brackets


<sup>vap</sup> S4UL presented exceed the vapour saturation limit, which is presented in brackets

The assessment criteria for each of the petroleum hydrocarbon fractions have been taken from Nathanail, C. P., McCaffrey, C., Gillett, A., Ogden, R., and Nathanail, J., 2015, 'The LQM/CIEH S4ULs for Human Health Risk Assessment', Land Quality Press, Nottingham. These are also all based on a sandy loam soil.

Within the Environment Agency Science Report P5-080/TR3, Askari, K. & Pollard, S., 2005 'The UK Approach for Evaluating Human Health Risks from Petroleum Hydrocarbons in Soils' it is stated that the assessment values should not be considered individually; instead the potential additive effects should be calculated. This is achieved by calculating an individual Hazard Quotient (HQ) for each fraction. The HQ is the proportion of the assessment concentration represented by the recorded concentration. The HQs are then added together to form a Hazard Index (HI) and where this exceeds unity a potential significant risk to human health may exist.

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Prepared	LM	Checked	KE	Date	13.03.24	Job No	48417
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A black and white photograph of a soil profile, showing various layers of soil and some roots. A teal diagonal shape overlays the top right corner of the image.

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