APPENDIX B
Dear Sir/ Madam,

Thank you for placing your order with Groundsure. Please find enclosed the **Groundsure Geo Insight** as requested.

If you need any further assistance, please do not hesitate to contact our helpline on 01886 832972 quoting the above CENTREMAPS reference number.

Yours faithfully,

CENTREMAPS

Enc.
Groundsure Geo Insight
Address: Cropper Road North Stanley, Blackpool,
Date: 9 Nov 2018
Reference: CMAPS-CM-755264-7904-091118GEO
Client: CENTREMAPS

Aerial Photograph Capture date: 03-Apr-2017
Grid Reference: 334622,433029
Site Size: 14.06ha
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Overview of Findings

The Groundsure Geo Insight provides high quality geo-environmental information that allows geo-environmental professionals and their clients to make informed decisions and be forewarned of potential ground instability problems that may affect the ground investigation, foundation design and possibly remediation options that could lead to possible additional costs.

The report is based on the BGS 1:50,000 and 1:10,000 Digital Geological Map of Great Britain, BGS Geosure data; BRITPITS database; Non-coal mining data and Borehole Records, Coal Authority data including brine extraction areas, PBA non-coal mining and natural cavities database, Johnson Poole and Bloomer mining data and Groundsure’s unique database including historical surface ground and underground workings.

For further details on each dataset, please refer to each individual section in the report as listed. Where the database has been searched a numerical result will be recorded. Where the database has not been searched ‘-’ will be recorded.

<table>
<thead>
<tr>
<th>Section 1: Geology 1:10,000 Scale</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 Artificial Ground</td>
<td></td>
</tr>
<tr>
<td>1.1 Is there any Artificial Ground/ Made Ground present beneath the study site at 1:10,000 scale?</td>
<td>No</td>
</tr>
<tr>
<td>1.2 Superficial Geology and Landslips</td>
<td></td>
</tr>
<tr>
<td>1.2.1 Is there any Superficial Ground/Drift Geology present beneath the study site at 1:10,000 scale?*</td>
<td>Yes</td>
</tr>
<tr>
<td>1.2.2 Are there any records of landslip within 500m of the study site boundary at 1:10,000 scale?</td>
<td>No</td>
</tr>
<tr>
<td>1.3 Bedrock, Solid Geology and linear features</td>
<td></td>
</tr>
<tr>
<td>1.3.1 For records of Bedrock and Solid Geology beneath the study site* see the detailed findings section.</td>
<td></td>
</tr>
<tr>
<td>1.3.2 Are there any records of linear features within 500m of the study site boundary at 1:10,000 scale?</td>
<td>No</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Section 2: Geology 1:50,000 Scale</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1 Artificial Ground</td>
<td></td>
</tr>
<tr>
<td>2.1.1 Is there any Artificial Ground/ Made Ground present beneath the study site?</td>
<td>No</td>
</tr>
<tr>
<td>2.1.2 Are there any records relating to permeability of artificial ground within the study site* boundary?</td>
<td>No</td>
</tr>
<tr>
<td>2.2 Superficial Geology and Landslips</td>
<td></td>
</tr>
<tr>
<td>2.2.1 Is there any Superficial Ground/Drift Geology present beneath the study site?*</td>
<td>Yes</td>
</tr>
<tr>
<td>2.2.2 Are there any records of permeability of superficial ground within 500m of the study site?</td>
<td>Yes</td>
</tr>
<tr>
<td>2.2.3 Are there any records of landslip within 500m of the study site boundary?</td>
<td>No</td>
</tr>
<tr>
<td>2.2.4 Are there any records relating to permeability of landslips within the study site* boundary?</td>
<td>No</td>
</tr>
</tbody>
</table>
## Section 2: Geology 1:50,000 Scale

### 2.3 Bedrock, Solid Geology and linear features

#### 2.3.1 For records of Bedrock and Solid Geology beneath the study site* see the detailed findings section.

#### 2.3.2 Are there any records relating to permeability of bedrock ground within the study site boundary?

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Yes</td>
</tr>
</tbody>
</table>

#### 2.3.3 Are there any records of linear features within 500m of the study site boundary?

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>No</td>
</tr>
</tbody>
</table>

## Section 3: Radon

### 3. Radon

#### 3.1 Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level?

The property is not in a Radon Affected Area, as less than 1% of properties are above the Action Level.

#### 3.2 Radon Protection

No radon protective measures are necessary.

## Section 4: Ground Workings

### 4.1 Historical Surface Ground Working Features from Small Scale Mapping

<table>
<thead>
<tr>
<th></th>
<th>On-site</th>
<th>0-50m</th>
<th>51-250</th>
<th>251-500</th>
<th>501-1000</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>0</td>
<td>9</td>
<td>Not Searched</td>
<td>Not Searched</td>
</tr>
</tbody>
</table>

### 4.2 Historical Underground Workings from Small Scale Mapping

|   | 0  | 0  | 0  | 0  | 0  |

### 4.3 Current Ground Workings

|   | 0  | 0  | 0  | 0  | 2  |

## Section 5: Mining, Extraction & Natural Cavities

### 5.1 Historical Mining

<table>
<thead>
<tr>
<th></th>
<th>On-site</th>
<th>0-50m</th>
<th>51-250</th>
<th>251-500</th>
<th>501-1000</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

### 5.2 Coal Mining

|   | 0  | 0  | 0  | 0  | 0  |

### 5.3 Johnson Poole and Bloomer Mining Area

|   | 0  | 0  | 0  | 0  | 0  |

### 5.4 Non-Coal Mining*

|   | 0  | 0  | 0  | 0  | 0  |

### 5.5 Non-Coal Mining Cavities

|   | 0  | 0  | 0  | 0  | 0  |

### 5.5 Natural Cavities

|   | 0  | 0  | 0  | 0  | 0  |

---

Report Reference: CMAPS-CM-755264-7904-091118GEO
Client Reference: 7904
### Section 5: Mining, Extraction & Natural Cavities

<table>
<thead>
<tr>
<th></th>
<th>On-site</th>
<th>0-50m</th>
<th>51-250</th>
<th>251-500</th>
<th>501-1000</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.6 Brine Extraction</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5.7 Gypsum Extraction</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5.8 Tin Mining</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5.9 Clay Mining</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

### Section 6: Natural Ground Subsidence

<table>
<thead>
<tr>
<th></th>
<th>On-site</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.1 Shrink-Swell Clay</td>
<td>Very Low</td>
</tr>
<tr>
<td>6.2 Landslides</td>
<td>Very Low</td>
</tr>
<tr>
<td>6.3 Ground Dissolution of Soluble Rocks</td>
<td>Negligible</td>
</tr>
<tr>
<td>6.4 Compressible Deposits</td>
<td>Negligible</td>
</tr>
<tr>
<td>6.5 Collapsible Deposits</td>
<td>Very Low</td>
</tr>
<tr>
<td>6.5 Running Sand</td>
<td>Very Low</td>
</tr>
</tbody>
</table>

### Section 7: Borehole Records

<table>
<thead>
<tr>
<th></th>
<th>On-site</th>
<th>0-50m</th>
<th>51-250</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 BGS Recorded Boreholes</td>
<td>1</td>
<td>8</td>
<td>1</td>
</tr>
</tbody>
</table>

### Section 8: Estimated Background Soil Chemistry

<table>
<thead>
<tr>
<th></th>
<th>On-site</th>
<th>0-50m</th>
<th>51-250</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 Records of Background Soil Chemistry</td>
<td>8</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

### Section 9: Railways and Tunnels

<table>
<thead>
<tr>
<th></th>
<th>On-site</th>
<th>0-50m</th>
<th>51-250</th>
<th>250-500</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.1 Tunnels</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Not Searched</td>
</tr>
<tr>
<td>9.2 Historical Railway and Tunnel Features</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Not Searched</td>
</tr>
<tr>
<td>9.3 Historical Railways</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Not Searched</td>
</tr>
<tr>
<td>9.4 Active Railways</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Not Searched</td>
</tr>
<tr>
<td>9.5 Railway Projects</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
Availability of 1:10,000 Scale Geology Mapping

The following information represents the availability of the key components of the 1:10,000 scale geological data.

<table>
<thead>
<tr>
<th>ID</th>
<th>Distance</th>
<th>Artificial Coverage</th>
<th>Superficial Coverage</th>
<th>Bedrock Coverage</th>
<th>Mass Movement Coverage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.0</td>
<td>Some deposits are mapped</td>
<td>Full</td>
<td>Full</td>
<td>No coverage</td>
</tr>
<tr>
<td>2</td>
<td>62.0</td>
<td>Some deposits are mapped</td>
<td>Full</td>
<td>Full</td>
<td>No coverage</td>
</tr>
<tr>
<td>N3</td>
<td>1755.0</td>
<td>Some deposits are mapped</td>
<td>Full</td>
<td>Full</td>
<td>No coverage</td>
</tr>
<tr>
<td>N4</td>
<td>1786.0</td>
<td>No deposits are mapped</td>
<td>Full</td>
<td>Full</td>
<td>No coverage</td>
</tr>
</tbody>
</table>

Guidance: The 1:10,000 scale geological interpretation is the most detailed generally available from BGS and is the scale at which most geological surveying is carried out in the field. The database is presented as four types of geology (artificial, mass movement, superficial and bedrock), although not all themes are mapped or available on every map sheet. Therefore a coverage layer showing the availability of the four themes is presented above.

The definitions of coverage are as follows:

<table>
<thead>
<tr>
<th>Geology</th>
<th>Full Coverage</th>
<th>Partial Coverage</th>
<th>No Coverage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bedrock</td>
<td>The whole tile has been mapped</td>
<td>Some but not all the tile has been mapped</td>
<td>No coverage</td>
</tr>
<tr>
<td>Superficial</td>
<td>The whole tile has been mapped</td>
<td>Some but not all of the tile has been mapped</td>
<td>No coverage</td>
</tr>
<tr>
<td>Artificial</td>
<td>Some deposits are mapped on this tile</td>
<td>-</td>
<td>No deposits are mapped</td>
</tr>
<tr>
<td>Mass Movement</td>
<td>Some deposits are mapped on this tile</td>
<td>-</td>
<td>No coverage</td>
</tr>
</tbody>
</table>
1 Geology (1:10,000 scale).

1.1 Artificial Ground map (1:10,000 scale)
1. Geology 1:10,000 scale

1.1 Artificial Ground

The following geological information represented on the mapping is derived from 1:10,000 scale BGS Geological mapping.

Are there any records of Artificial/ Made Ground within 500m of the study site boundary at 1:10,000 scale?  

Yes

<table>
<thead>
<tr>
<th>ID</th>
<th>Distance</th>
<th>Direction</th>
<th>LEX Code</th>
<th>Description</th>
<th>Rock Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>348.0</td>
<td>NE</td>
<td>WGR-VOID</td>
<td>Worked Ground (Undivided)</td>
<td>Void</td>
</tr>
</tbody>
</table>

Report Reference: CMAP5-CM-755264-7904-091118GEO
Client Reference: 7904
1.2 Superficial Deposits and Landslips map (1:10,000 scale)
1.2 Superficial Deposits and Landslips

The following geological information represented on the mapping is derived from 1:10,000 scale BGS Geological mapping

1.2.1 Superficial Deposits/ Drift Geology

Are there any records of Superficial Deposits/ Drift Geology within 500m of the study site boundary at 1:10,000 scale?

<table>
<thead>
<tr>
<th>ID</th>
<th>Distance (m)</th>
<th>Direction</th>
<th>LEX Code</th>
<th>Description</th>
<th>Rock Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.0</td>
<td>On Site</td>
<td>TILLD-DMTN</td>
<td>Till, Devensian - Diamicton</td>
<td>Diamicton</td>
</tr>
<tr>
<td>2</td>
<td>62.0</td>
<td>E</td>
<td>TILLD-CSVZ</td>
<td>Till, Devensian - Clay, Sandy, Gravelly, Silty (unlithified Deposits Coding Scheme)</td>
<td>Clay, Sandy, Gravelly, Silty</td>
</tr>
<tr>
<td>3</td>
<td>92.0</td>
<td>SE</td>
<td>PEAT-P</td>
<td>Peat - Peat</td>
<td>Peat</td>
</tr>
<tr>
<td>4</td>
<td>162.0</td>
<td>SW</td>
<td>PEAT-P</td>
<td>Peat - Peat</td>
<td>Peat</td>
</tr>
<tr>
<td>5</td>
<td>172.0</td>
<td>SE</td>
<td>PEAT-P</td>
<td>Peat - Peat</td>
<td>Peat</td>
</tr>
<tr>
<td>6</td>
<td>340.0</td>
<td>SE</td>
<td>TILLD-CSVZ</td>
<td>Till, Devensian - Clay, Sandy, Gravelly, Silty (unlithified Deposits Coding Scheme)</td>
<td>Clay, Sandy, Gravelly, Silty</td>
</tr>
<tr>
<td>7</td>
<td>461.0</td>
<td>SE</td>
<td>TFD1-XZCS</td>
<td>Tidal Flat Deposits, 1 - Silt, Clay And Sand</td>
<td>Silt, Clay And Sand</td>
</tr>
</tbody>
</table>

1.2.2 Landslip

Are there any records of Landslip within 500m of the study site boundary at 1:10,000 scale?

No

Database searched and no data found.

The geology map for the site and surrounding area are extracted from the BGS Digital Geological Map of Great Britain at 1:10,000 scale

This Geology shows the main components as discrete layers, these are: Artificial / Made Ground, Superficial / Drift Geology and Landslips. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nationwide coverage.
1.3 Bedrock and linear features map (1:10,000 scale)
1.3 Bedrock and linear features

The following geological information represented on the mapping is derived from 1:10,000 scale BGS Geological mapping.

1.3.1 Bedrock/ Solid Geology

Records of Bedrock/Solid Geology within 500m of the study site boundary at 1:10,000 scale.

<table>
<thead>
<tr>
<th>ID</th>
<th>Distance (m)</th>
<th>Direction</th>
<th>LEX Code</th>
<th>Description</th>
<th>Rock Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.0</td>
<td>On Site</td>
<td>KRM-MDST</td>
<td>Kirkham Mudstone Member - Mudstone</td>
<td>Ladinian Age - Anisian Age</td>
</tr>
<tr>
<td>2</td>
<td>62.0</td>
<td>E</td>
<td>SIM-MDST</td>
<td>Sidmouth Mudstone Formation - Mudstone</td>
<td>Carnian Age - Olenekian Age</td>
</tr>
</tbody>
</table>

1.3.2 Linear features

Are there any records of linear features within 500m of the study site boundary at 1:10,000 scale?  No

Database searched and no data found at this scale.

The geology map for the site and surrounding area are extracted from the BGS Digital Geological Map of great Britain at 1:10,000 scale.

This Geology shows the main components as discrete layers, these are: Bedrock/ Solid Geology and linear features such as faults. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nationwide coverage.
2 Geology 1:50,000 Scale

2.1 Artificial Ground map

Site Outline

Made Ground (undivided)

Disturbed Ground (undivided)

Worked Ground (undivided)

Infilled Ground

Landscaped Ground (undivided)

Reclaimed Ground

500

1000

Search Buffers (m)

2. Geology 1:50,000 scale

2.1 Artificial Ground

The following geological information represented on the mapping is derived from 1:50,000 scale BGS Geological mapping, Sheet No: 074

2.1.1 Artificial/ Made Ground

Are there any records of Artificial/ Made Ground within 500m of the study site boundary? No

Database searched and no data found.

2.1.2 Permeability of Artificial Ground

Are there any records relating to permeability of artificial ground within the study site boundary? No

Database searched and no data found.
2.2 Superficial Deposits and Landslips map (1:50,000 scale)
2.2 Superficial Deposits and Landslips

2.2.1 Superficial Deposits/ Drift Geology

Are there any records of Superficial Deposits/ Drift Geology within 500m of the study site boundary? Yes

<table>
<thead>
<tr>
<th>ID</th>
<th>Distance</th>
<th>Direction</th>
<th>LEX Code</th>
<th>Description</th>
<th>Rock Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.0</td>
<td>On Site</td>
<td>TILLD-DMTN</td>
<td>TILL, DEVENSIAN</td>
<td>DIAMICTON</td>
</tr>
<tr>
<td>2</td>
<td>0.0</td>
<td>On Site</td>
<td>TILLD-DMTN</td>
<td>TILL, DEVENSIAN</td>
<td>DIAMICTON</td>
</tr>
<tr>
<td>3</td>
<td>109.0</td>
<td>SE</td>
<td>PEAT-P</td>
<td>PEAT</td>
<td>PEAT</td>
</tr>
<tr>
<td>4</td>
<td>189.0</td>
<td>SW</td>
<td>PEAT-P</td>
<td>PEAT</td>
<td>PEAT</td>
</tr>
<tr>
<td>5</td>
<td>440.0</td>
<td>SE</td>
<td>ALV-XCZSV</td>
<td>ALLUVIUM</td>
<td>CLAY, SILT, SAND AND GRAVEL</td>
</tr>
</tbody>
</table>

2.2.2 Permeability of Superficial Ground

Are there any records relating to permeability of superficial ground within the study site boundary? Yes

<table>
<thead>
<tr>
<th>Distance (m)</th>
<th>Direction</th>
<th>Flow Type</th>
<th>Maximum Permeability</th>
<th>Minimum Permeability</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0</td>
<td>On Site</td>
<td>Mixed</td>
<td>High</td>
<td>Low</td>
</tr>
</tbody>
</table>

2.2.3 Landslip

Are there any records of Landslip within 500m of the study site boundary? No

Database searched and no data found.

The geology map for the site and surrounding area are extracted from the BGS Digital Geological Map of Great Britain at 1:50,000 scale.

This Geology shows the main components as discrete layers, there are: Artificial/ Made Ground, Superficial/ Drift Geology and Landslips. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nationwide coverage.

2.2.4 Landslip Permeability

Are there any records relating to permeability of landslips within the study site boundary? No

Database searched and no data found.
2.3 Bedrock and linear features map (1:50,000 scale)
2.3 Bedrock, Solid Geology & linear features

The following geological information represented on the mapping is derived from 1:50,000 scale BGS Geological mapping, Sheet No: 074

2.3.1 Bedrock/Solid Geology

Records of Bedrock/Solid Geology within 500m of the study site boundary:

<table>
<thead>
<tr>
<th>ID</th>
<th>Distance</th>
<th>Direction</th>
<th>LEX Code</th>
<th>Rock Description</th>
<th>Rock Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.0</td>
<td>On Site</td>
<td>KRM-MDST</td>
<td>KIRKHAM MUDSTONE MEMBER - MUDSTONE</td>
<td>ANISIAN</td>
</tr>
<tr>
<td>2</td>
<td>0.0</td>
<td>On Site</td>
<td>KRM-MDST</td>
<td>KIRKHAM MUDSTONE MEMBER - MUDSTONE</td>
<td>ANISIAN</td>
</tr>
</tbody>
</table>

2.3.2 Permeability of Bedrock Ground

Are there any records relating to permeability of bedrock ground within the study site boundary? Yes

<table>
<thead>
<tr>
<th>Distance</th>
<th>Direction</th>
<th>Flow Type</th>
<th>Maximum Permeability</th>
<th>Minimum Permeability</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0</td>
<td>On Site</td>
<td>Fracture</td>
<td>Low</td>
<td>Low</td>
</tr>
</tbody>
</table>

2.3.3 Linear features

Are there any records of linear features within 500m of the study site boundary? No

Database searched and no data found.

The geology map for the site and surrounding area are extracted from the BGS Digital Geological Map of Great Britain at 1:50,000 scale.

This Geology shows the main components as discrete layers, these are: Bedrock/Solid Geology and linear features such as faults. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nation wide coverage.
3 Radon Data

3.1 Radon Affected Areas

Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level? The property is not in a Radon Affected Area, as less than 1% of properties are above the Action Level.

The radon data in this report is supplied by the BGS/Public Health England and is the definitive map of Radon Affected Areas in Great Britain and Northern Ireland. The dataset was created using long-term radon measurements in over 479,000 homes across Great Britain and 23,000 homes across Northern Ireland, combined with geological data. The dataset is considered accurate to 50m to allow for the margin of error in geological lines, and the findings of this report supercede any answer given in the less accurate Indicative Atlas of Radon in Great Britain, which simplifies the data to give the highest risk within any given 1km grid square. As such, the radon atlas is considered indicative, whereas the data given in this report is considered definitive.

3.2 Radon Protection

Is the property in an area where Radon Protection are required for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment? No radon protective measures are necessary.
4 Ground Workings

4.1 Historical Surface Ground Working Features derived from Historical Mapping

This dataset is based on Groundsure’s unique Historical Land Use Database derived from 1:10,560 and 1:10,000 scale historical mapping.

Are there any Historical Surface Ground Working Features within 250m of the study site boundary?  Yes

<table>
<thead>
<tr>
<th>ID</th>
<th>Distance (m)</th>
<th>Direction</th>
<th>NGR</th>
<th>Use</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.0</td>
<td>On Site</td>
<td>334891</td>
<td>Pond</td>
<td>1968</td>
</tr>
<tr>
<td>2</td>
<td>173.0</td>
<td>NE</td>
<td>335067</td>
<td>Pond</td>
<td>1891</td>
</tr>
<tr>
<td>3A</td>
<td>223.0</td>
<td>N</td>
<td>334318</td>
<td>Pond</td>
<td>1930</td>
</tr>
<tr>
<td>4A</td>
<td>223.0</td>
<td>N</td>
<td>334318</td>
<td>Pond</td>
<td>1938</td>
</tr>
<tr>
<td>5A</td>
<td>223.0</td>
<td>N</td>
<td>334318</td>
<td>Pond</td>
<td>1909</td>
</tr>
<tr>
<td>6A</td>
<td>223.0</td>
<td>N</td>
<td>334318</td>
<td>Pond</td>
<td>1891</td>
</tr>
<tr>
<td>7A</td>
<td>230.0</td>
<td>N</td>
<td>334318</td>
<td>Pond</td>
<td>1987</td>
</tr>
<tr>
<td>8A</td>
<td>230.0</td>
<td>N</td>
<td>334318</td>
<td>Pond</td>
<td>1981</td>
</tr>
<tr>
<td>9A</td>
<td>230.0</td>
<td>N</td>
<td>334318</td>
<td>Pond</td>
<td>1968</td>
</tr>
<tr>
<td>10A</td>
<td>230.0</td>
<td>N</td>
<td>334318</td>
<td>Pond</td>
<td>1951</td>
</tr>
</tbody>
</table>

4.2 Historical Underground Working Features derived from Historical Mapping

This data is derived from the Groundsure unique Historical Land Use Database. It contains data derived from 1:10,000 and 1:10,560 historical Ordnance Survey Mapping and includes some natural topographical features (Shake Holes for example) as well as manmade features that may have implications for ground stability. Underground and mining features have been identified from surface features such as shafts. The distance that these extend underground is not shown.

Are there any Historical Underground Working Features within 1000m of the study site boundary?  No

Database searched and no data found.
4.3 Current Ground Workings

This dataset is derived from the BGS BRITPITS database covering active; inactive mines; quarries; oil wells; gas wells and mineral wharves; and rail deposits throughout the British Isles.

Are there any BGS Current Ground Workings within 1000m of the study site boundary? Yes

The following Current Ground Workings information is provided by British Geological Survey:

<table>
<thead>
<tr>
<th>ID</th>
<th>Distance (m)</th>
<th>Direction</th>
<th>NGR</th>
<th>Commodity Produced</th>
<th>Pit Name</th>
<th>Type of working</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not shown</td>
<td>515.0</td>
<td>S</td>
<td>334954</td>
<td>Clay &amp; Shale</td>
<td>Whitehill Cottages</td>
<td>A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site</td>
<td>Ceased</td>
</tr>
<tr>
<td>Not shown</td>
<td>971.0</td>
<td>SE</td>
<td>335820</td>
<td>Clay &amp; Shale</td>
<td>Under the Hill Farm</td>
<td>A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site</td>
<td>Ceased</td>
</tr>
</tbody>
</table>

Report Reference: CMAPS-CM-755264-7904-091118GEO
Client Reference: 7904
5 Mining, Extraction & Natural Cavities

5.1 Historical Mining
This dataset is derived from Groundsure unique Historical Land-use Database that are indicative of mining or extraction activities.

Are there any Historical Mining areas within 1000m of the study site boundary? No

Database searched and no data found.

5.2 Coal Mining
This dataset provides information as to whether the study site lies within a known coal mining affected area as defined by the coal authority.

Are there any Coal Mining areas within 1000m of the study site boundary? No

Database searched and no data found.

5.3 Johnson Poole and Bloomer
This dataset provides information as to whether the study site lies within an area where JPB hold information relating to mining.

Are there any JPB Mining areas within 1000m of the study site boundary? No

The following information provided by JPB is not represented on mapping: Database searched and no data found.

5.4 Non-Coal Mining
This dataset provides information as to whether the study site lies within an area which may have been subject to non-coal historic mining.

Are there any Non-Coal Mining areas within 1000m of the study site boundary? No

Database searched and no data found.
5.5 Non-Coal Mining Cavities

This dataset provides information from the Peter Brett Associates (PBA) mining cavities database (compiled for the national study entitled “Review of mining instability in Great Britain, 1990” PBA has also continued adding to this database) on mineral extraction by mining.

Are there any Non-Coal Mining cavities within 1000m of the study site boundary? No

Database searched and no data found.

5.6 Natural Cavities

This dataset provides information based on the Peter Brett Associates natural cavities database. The dataset is made up of points and polygons. Where polygons are used these represent an area in which it is expected the cavities could be found. It does not indicate that cavities are present everywhere within the polygon, and caution should be used in the interpretation of this data.

Are there any Natural Cavities within 1000m of the study site boundary? No

Database searched and no data found.

5.7 Brine Extraction

This data provides information from the Cheshire Brine Subsidence Compensation Board.

Are there any Brine Extraction areas within 1000m of the study site boundary? No

Database searched and no data found.

5.8 Gypsum Extraction

This dataset provides information on Gypsum extraction from British Gypsum records.

Are there any Gypsum Extraction areas within 1000m of the study site boundary? No

Database searched and no data found.

5.9 Tin Mining

This dataset provides information on tin mining areas and is derived from tin mining records. This search is based upon postcode information to a sector level.

Are there any Tin Mining areas within 1000m of the study site boundary? No

Database searched and no data found.
This dataset provides information on Kaolin and Ball Clay mining from relevant mining records.

Are there any Clay Mining areas within 1000m of the study site boundary?  

No

Database searched and no data found.
6 Natural Ground Subsidence

6.1 Shrink-Swell Clay map
6.2 Landslides map
6.3 Ground Dissolution of Soluble Rocks map
6.5 Collapsible Deposits map

Collapsible Deposits Legend

Ordnance Survey licence 100035207.
6.6 Running Sand map
6 Natural Ground Subsidence

The National Ground Subsidence rating is obtained through the 6 natural ground stability hazard datasets, which are supplied by the British Geological Survey (BGS).

The following GeoSure data represented on the mapping is derived from the BGS Digital Geological map of Great Britain at 1:50,000 scale.

What is the maximum hazard rating of natural subsidence within the study site* boundary? Very Low

6.1 Shrink-Swell Clays

The following Shrink Swell information provided by the British Geological Survey:

<table>
<thead>
<tr>
<th>ID</th>
<th>Distance (m)</th>
<th>Direction</th>
<th>Hazard Rating</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.0</td>
<td>On Site</td>
<td>Very Low</td>
<td>Ground conditions predominantly low plasticity. No special actions required to avoid problems due to shrink-swell clays. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with shrink-swell clays.</td>
</tr>
</tbody>
</table>

6.2 Landslides

The following Landslides information provided by the British Geological Survey:

<table>
<thead>
<tr>
<th>ID</th>
<th>Distance (m)</th>
<th>Direction</th>
<th>Hazard Rating</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.0</td>
<td>On Site</td>
<td>Very Low</td>
<td>Slope instability problems are unlikely to be present. No special actions required to avoid problems due to landslides. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with landslides.</td>
</tr>
</tbody>
</table>

6.3 Ground Dissolution of Soluble Rocks

The following Ground Dissolution information provided by the British Geological Survey:

<table>
<thead>
<tr>
<th>ID</th>
<th>Distance (m)</th>
<th>Direction</th>
<th>Hazard Rating</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.0</td>
<td>On Site</td>
<td>Negligible</td>
<td>Soluble rocks are present, but unlikely to cause problems except under exceptional conditions. No special actions required to avoid problems due to soluble rocks. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with soluble rocks.</td>
</tr>
</tbody>
</table>

* This includes an automatically generated 50m buffer zone around the site

Report Reference: CMAPS-CM-755264-7904-091118GEO
Client Reference: 7904
6.4 Compressible Deposits

The following Compressible Deposits information provided by the British Geological Survey:

<table>
<thead>
<tr>
<th>ID</th>
<th>Distance (m)</th>
<th>Direction</th>
<th>Hazard Rating</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.0</td>
<td>On Site</td>
<td>Negligible</td>
<td>No indicators for compressible deposits identified. No special actions required to avoid problems due to compressible deposits. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with compressible deposits.</td>
</tr>
</tbody>
</table>

6.5 Collapsible Deposits

The following Collapsible Rocks information provided by the British Geological Survey:

<table>
<thead>
<tr>
<th>ID</th>
<th>Distance (m)</th>
<th>Direction</th>
<th>Hazard Rating</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.0</td>
<td>On Site</td>
<td>Very Low</td>
<td>Deposits with potential to collapse when loaded and saturated are unlikely to be present. No special ground investigation required or increased construction costs or increased financial risk due to potential problems with collapsible deposits.</td>
</tr>
</tbody>
</table>

6.6 Running Sands

The following Running Sands information provided by the British Geological Survey:

<table>
<thead>
<tr>
<th>ID</th>
<th>Distance (m)</th>
<th>Direction</th>
<th>Hazard Rating</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.0</td>
<td>On Site</td>
<td>Very Low</td>
<td>Very low potential for running sand problems if water table rises or if sandy strata are exposed to water. No special actions required, to avoid problems due to running sand. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with running sand.</td>
</tr>
</tbody>
</table>
The systematic analysis of data extracted from the BGS Borehole Records database provides the following information.

Records of boreholes within 250m of the study site boundary:

<table>
<thead>
<tr>
<th>ID</th>
<th>Distance (m)</th>
<th>Direction</th>
<th>NGR</th>
<th>BGS Reference</th>
<th>Drilled Length</th>
<th>Borehole Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.0</td>
<td>On Site</td>
<td>334530</td>
<td>SD33SW103</td>
<td>15.0</td>
<td>BLACKPOOL FYLDE INDUSTRIAL ESTATE 13</td>
</tr>
<tr>
<td>2</td>
<td>6.0</td>
<td>N</td>
<td>334370</td>
<td>SD33SW101</td>
<td>15.0</td>
<td>BLACKPOOL FYLDE INDUSTRIAL ESTATE 11</td>
</tr>
<tr>
<td>3A</td>
<td>6.0</td>
<td>N</td>
<td>334450</td>
<td>SD33SW102</td>
<td>15.0</td>
<td>BLACKPOOL FYLDE INDUSTRIAL ESTATE 12</td>
</tr>
<tr>
<td>4A</td>
<td>6.0</td>
<td>N</td>
<td>334460</td>
<td>SD33SW107</td>
<td>15.0</td>
<td>BLACKPOOL FYLDE INDUSTRIAL ESTATE 17</td>
</tr>
<tr>
<td>5</td>
<td>7.0</td>
<td>N</td>
<td>334490</td>
<td>SD33SW105</td>
<td>15.0</td>
<td>BLACKPOOL FYLDE INDUSTRIAL ESTATE 15</td>
</tr>
<tr>
<td>6</td>
<td>7.0</td>
<td>N</td>
<td>334330</td>
<td>SD33SW160</td>
<td>14.0</td>
<td>OLD HOUSE LANE, BLACKPOOL 10</td>
</tr>
<tr>
<td>7</td>
<td>20.0</td>
<td>W</td>
<td>334540</td>
<td>SD33SW104</td>
<td>15.0</td>
<td>BLACKPOOL FYLDE INDUSTRIAL ESTATE 14</td>
</tr>
<tr>
<td>8</td>
<td>46.0</td>
<td>N</td>
<td>334440</td>
<td>SD33SW108</td>
<td>15.0</td>
<td>BLACKPOOL FYLDE INDUSTRIAL ESTATE 18</td>
</tr>
<tr>
<td>9</td>
<td>47.0</td>
<td>N</td>
<td>334510</td>
<td>SD33SW106</td>
<td>15.0</td>
<td>BLACKPOOL FYLDE INDUSTRIAL ESTATE 16</td>
</tr>
<tr>
<td>10</td>
<td>56.0</td>
<td>SW</td>
<td>334359</td>
<td>SD33SW8</td>
<td>24.38</td>
<td>LINWOOD NURSERIES, MARTON</td>
</tr>
</tbody>
</table>

The borehole records are available using the hyperlinks below: Please note that if the donor of the borehole record has requested the information be held as commercial-in-confidence, the additional data will be held separately by the BGS and a formal request must be made for its release.

#1: scans.bgs.ac.uk/sobi_scans/boreholes/2415  
#2: scans.bgs.ac.uk/sobi_scans/boreholes/2413  
#3A: scans.bgs.ac.uk/sobi_scans/boreholes/2414  
#4A: scans.bgs.ac.uk/sobi_scans/boreholes/2419  
#5: scans.bgs.ac.uk/sobi_scans/boreholes/2417  
#6: scans.bgs.ac.uk/sobi_scans/boreholes/15047824  
#7: scans.bgs.ac.uk/sobi_scans/boreholes/2416  
#8: scans.bgs.ac.uk/sobi_scans/boreholes/2420  
#9: scans.bgs.ac.uk/sobi_scans/boreholes/2418  
#10: scans.bgs.ac.uk/sobi_scans/boreholes/2305
# 8 Estimated Background Soil Chemistry

Records of background estimated soil chemistry within 250m of the study site boundary:

For further information on how this data is calculated and limitations upon its use, please see the Groundsure Geo Insight User Guide, available on request.

<table>
<thead>
<tr>
<th>Distance (m)</th>
<th>Direction</th>
<th>Sample Type</th>
<th>Arsenic (As)</th>
<th>Cadmium (Cd)</th>
<th>Chromium (Cr)</th>
<th>Nickel (Ni)</th>
<th>Lead (Pb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0</td>
<td>On Site</td>
<td>RuSoilExAs</td>
<td>&lt;15 mg/kg</td>
<td>&lt;1.8 mg/kg</td>
<td>60 - 90 mg/kg</td>
<td>15 - 30 mg/kg</td>
<td>&lt;100 mg/kg</td>
</tr>
<tr>
<td>0.0</td>
<td>On Site</td>
<td>RuSoilExAs</td>
<td>&lt;15 mg/kg</td>
<td>&lt;1.8 mg/kg</td>
<td>60 - 90 mg/kg</td>
<td>15 - 30 mg/kg</td>
<td>&lt;100 mg/kg</td>
</tr>
<tr>
<td>0.0</td>
<td>On Site</td>
<td>RuSoilExAs</td>
<td>&lt;15 mg/kg</td>
<td>&lt;1.8 mg/kg</td>
<td>60 - 90 mg/kg</td>
<td>15 - 30 mg/kg</td>
<td>&lt;100 mg/kg</td>
</tr>
<tr>
<td>0.0</td>
<td>On Site</td>
<td>RuSoilExAs</td>
<td>&lt;15 mg/kg</td>
<td>&lt;1.8 mg/kg</td>
<td>60 - 90 mg/kg</td>
<td>15 - 30 mg/kg</td>
<td>&lt;100 mg/kg</td>
</tr>
<tr>
<td>0.0</td>
<td>On Site</td>
<td>RuSoilExAs</td>
<td>&lt;15 mg/kg</td>
<td>&lt;1.8 mg/kg</td>
<td>60 - 90 mg/kg</td>
<td>15 - 30 mg/kg</td>
<td>&lt;100 mg/kg</td>
</tr>
</tbody>
</table>

*As this data is based upon underlying 1:50,000 scale geological information, a 50m buffer has been added to the search radius.*
9 Railways and Tunnels

9.1 Tunnels

This data is derived from OpenStreetMap and provides information on the possible locations of underground railway systems in the UK - the London Underground, the Tyne & Wear Metro and the Glasgow Subway.

Have any underground railway lines been identified within the study site boundary? No
Have any underground railway lines been identified within 250m of the study site boundary? No

Database searched and no data found.

Any records that have been identified are represented on the Railways and Tunnels map.

This data is derived from Ordnance Survey mapping and provides information on the possible locations of railway tunnels forming part of the UK overground railway network.

Have any other railway tunnels been identified within the site boundary? No
Have any other railway tunnels been identified within 250m of the site boundary? No

Database searched and no data found.

Any records that have been identified are represented on the Railways and Tunnels map.

9.2 Historical Railway and Tunnel Features

This data is derived from Groundsure’s unique Historical Land-use Database and contains features relating to tunnels, railway tracks or associated works that have been identified from historical Ordnance Survey mapping.

Have any historical railway or tunnel features been identified within the study site boundary? No
Have any historical railway or tunnel features been identified within 250m of the study site boundary? No

Database searched and no data found.

Any records that have been identified are represented on the Railways and Tunnels map.
9.3 Historical Railways

This data is derived from OpenStreetMap and provides information on the possible alignments of abandoned or dismantled railway lines in proximity to the study site.

Have any historical railway lines been identified within the study site boundary? No
Have any historical railway lines been identified within 250m of the study site boundary? No

Database searched and no data found.

Multiple sections of the same track may be listed in the detail above
Any records that have been identified are represented on the Railways and Tunnels map.

9.4 Active Railways

These datasets are derived from Ordnance Survey mapping and OpenStreetMap and provide information on the possible locations of active railway lines in proximity to the study site.

Have any active railway lines been identified within the study site boundary? No
Have any active railway lines been identified within 250m of the study site boundary? No

Database searched and no data found.

Multiple sections of the same track may be listed in the detail above
Any records that have been identified are represented on the Railways and Tunnels map.

9.5 Railway Projects

These datasets provide information on the location of large scale railway projects High Speed 2 and Crossrail 1.

Is the study site within 5km of the route of the High Speed 2 rail project? No
Is the study site within 500m of the route of the Crossrail 1 rail project? No

Further information on proximity to these routes, the project construction status and associated works can be obtained through the purchase of a Groundsure HS2 and Crossrail 1 Report.

The route data has been digitised from publicly available maps by Groundsure. The route as provided relates to the Crossrail 1 project only, and does not include any details of the Crossrail 2 project, as final details of the route for Crossrail 2 are still under consultation.

Please note that this assessment takes account of both the original Phase 2b proposed route and the amended route proposed in 2016. As the Phase 2b route is still under consultation, Groundsure are providing information on both options until the final route is formally confirmed. Practitioners should take account of this uncertainty when advising clients.
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