



**TIM O'HARE ASSOCIATES**  
SOIL & LANDSCAPE CONSULTANCY

|             |                                |
|-------------|--------------------------------|
| Client:     | Applied Geology Limited        |
| Project:    | Hoyland Common (AG-3080-19)    |
| Job:        | Topsoil Analysis (BS3882:2015) |
| Date:       | 16/03/2020                     |
| Job Ref No: | TOHA/20/9429/SS/Rev.1          |

| Sample Reference                  |      |               |
|-----------------------------------|------|---------------|
| Sample Location                   |      |               |
|                                   |      | Accreditation |
| Clay (<0.002mm)                   | %    | UKAS          |
| Silt (0.002-0.063mm)              | %    | UKAS          |
| Sand (0.063-2.0mm)                | %    | UKAS          |
| Texture Class (UK Classification) | ---  | UKAS          |
| Stones (2-20mm)                   | % DW | GLP           |
| Stones (20-50mm)                  | % DW | GLP           |
| Stones (>50mm)                    | % DW | GLP           |

|                                                         |       |      |
|---------------------------------------------------------|-------|------|
| pH Value (1:2.5 water extract)                          | units | UKAS |
| Electrical Conductivity (1:2.5 water extract)           | uS/cm | UKAS |
| Electrical Conductivity (1:2 CaSO <sub>4</sub> extract) | uS/cm | UKAS |
| Exchangeable Sodium Percentage                          | %     | UKAS |
| Organic Matter (LOI)                                    | %     | UKAS |
| Total Nitrogen (Dumas)                                  | %     | UKAS |
| C : N Ratio                                             | ratio | UKAS |
| Extractable Phosphorus                                  | mg/l  | UKAS |
| Extractable Potassium                                   | mg/l  | UKAS |
| Extractable Magnesium                                   | mg/l  | UKAS |

|                             |       |        |
|-----------------------------|-------|--------|
| Total Arsenic (As)          | mg/kg | MCERTS |
| Total Cadmium (Cd)          | mg/kg | MCERTS |
| Total Chromium (Cr)         | mg/kg | MCERTS |
| Hexavalent Chromium (Cr VI) | mg/kg | MCERTS |
| Total Copper (Cu)           | mg/kg | MCERTS |
| Total Lead (Pb)             | mg/kg | MCERTS |
| Total Mercury (Hg)          | mg/kg | MCERTS |
| Total Nickel (Ni)           | mg/kg | MCERTS |
| Total Selenium (Se)         | mg/kg | MCERTS |
| Total Zinc (Zn)             | mg/kg | MCERTS |
| Water Soluble Boron (B)     | mg/kg | MCERTS |
| Total Cyanide (CN)          | mg/kg | MCERTS |
| Total (mono) Phenols        | mg/kg | MCERTS |

|                          |       |        |
|--------------------------|-------|--------|
| Naphthalene              | mg/kg | MCERTS |
| Acenaphthylene           | mg/kg | MCERTS |
| Acenaphthene             | mg/kg | MCERTS |
| Fluorene                 | mg/kg | MCERTS |
| Phenanthrene             | mg/kg | MCERTS |
| Anthracene               | mg/kg | MCERTS |
| Fluoranthene             | mg/kg | MCERTS |
| Pyrene                   | mg/kg | MCERTS |
| Benz(a)anthracene        | mg/kg | MCERTS |
| Chrysene                 | mg/kg | MCERTS |
| Benzo(b)fluoranthene     | mg/kg | MCERTS |
| Benzo(k)fluoranthene     | mg/kg | MCERTS |
| Benzo(a)pyrene           | mg/kg | MCERTS |
| Indeno(1,2,3-cd)pyrene   | mg/kg | MCERTS |
| Dibenzo(a,h)anthracene   | mg/kg | MCERTS |
| Benzo(g,h,i)perylene     | mg/kg | MCERTS |
| Total PAHs (sum USEPA16) | mg/kg | MCERTS |

|                          |       |        |
|--------------------------|-------|--------|
| Aliphatic TPH >C5 - C6   | mg/kg | MCERTS |
| Aliphatic TPH >C6 - C8   | mg/kg | MCERTS |
| Aliphatic TPH >C8 - C10  | mg/kg | MCERTS |
| Aliphatic TPH >C10 - C12 | mg/kg | MCERTS |
| Aliphatic TPH >C12 - C16 | mg/kg | MCERTS |
| Aliphatic TPH >C16 - C21 | mg/kg | MCERTS |
| Aliphatic TPH >C21 - C35 | mg/kg | MCERTS |
| Aliphatic TPH (C5 - C35) | mg/kg | MCERTS |
| Aromatic TPH >C5 - C7    | mg/kg | MCERTS |
| Aromatic TPH >C7 - C8    | mg/kg | MCERTS |
| Aromatic TPH >C8 - C10   | mg/kg | MCERTS |
| Aromatic TPH >C10 - C12  | mg/kg | MCERTS |
| Aromatic TPH >C12 - C16  | mg/kg | MCERTS |
| Aromatic TPH >C16 - C21  | mg/kg | MCERTS |
| Aromatic TPH >C21 - C35  | mg/kg | MCERTS |
| Aromatic TPH (C5 - C35)  | mg/kg | MCERTS |

|                                    |       |        |
|------------------------------------|-------|--------|
| Benzene                            | mg/kg | MCERTS |
| Toluene                            | mg/kg | MCERTS |
| Ethylbenzene                       | mg/kg | MCERTS |
| p & m-xylene                       | mg/kg | MCERTS |
| o-xylene                           | mg/kg | MCERTS |
| MTBE (Methyl Tertiary Butyl Ether) | mg/kg | MCERTS |

| Location 1<br>TP1106 | Location 2<br>TP1109 | Location 3<br>TT2029 | Location 4<br>TP1077 | Location 5<br>TP1074 | Location 6<br>TP1035 |
|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| 37                   | 39                   | 34                   | 38                   | 48                   | 45                   |
| 41                   | 40                   | 42                   | 43                   | 45                   | 46                   |
| 22                   | 21                   | 24                   | 19                   | 7                    | 9                    |
| C                    | C                    | CL                   | C                    | ZC                   | ZC                   |
| 1                    | 0                    | 1                    | 1                    | 0                    | 1                    |
| 5                    | 0                    | 3                    | 1                    | 0                    | 0                    |
| 0                    | 0                    | 0                    | 5                    | 6                    | 0                    |
| 7.3                  | 6.5                  | 6.5                  | 7.2                  | 7.2                  | 7.2                  |
| 68                   | 63                   | 52                   | 68                   | 79                   | 70                   |
| 2020                 | 1995                 | 1988                 | 2060                 | 2037                 | 2038                 |
| 0.5                  | 0.9                  | 0.8                  | 0.6                  | 0.6                  | 0.4                  |
| 4.9                  | 7.4                  | 6.5                  | 5.5                  | 7.3                  | 6.5                  |
| 0.18                 | 0.27                 | 0.24                 | 0.20                 | 0.24                 | 0.24                 |
| 16                   | 16                   | 16                   | 16                   | 18                   | 16                   |
| 11                   | 9                    | 6                    | 10                   | 6                    | 7                    |
| 99                   | 46                   | 57                   | 110                  | 106                  | 138                  |
| 164                  | 208                  | 161                  | 203                  | 398                  | 268                  |
| 14                   | 15                   | 14                   | 12                   | 14                   | 13                   |
| 0.4                  | 0.4                  | 0.2                  | 0.2                  | 0.3                  | 0.3                  |
| 34                   | 29                   | 24                   | 26                   | 27                   | 27                   |
| < 4.0                | < 4.0                | < 4.0                | < 4.0                | < 4.0                | < 4.0                |
| 27                   | 39                   | 24                   | 29                   | 29                   | 26                   |
| 47                   | 63                   | 44                   | 38                   | 34                   | 41                   |
| < 0.3                | < 0.3                | < 0.3                | < 0.3                | < 0.3                | < 0.3                |
| 25                   | 20                   | 19                   | 26                   | 29                   | 28                   |
| 3                    | 4                    | 4                    | 3                    | 2                    | 4                    |
| 100                  | 120                  | 90                   | 100                  | 86                   | 97                   |
| 1                    | 1.3                  | 1.3                  | 1                    | 1.1                  | 1.3                  |
| < 1                  | < 1                  | < 1                  | < 1                  | < 1                  | < 1                  |
| < 1.0                | < 1.0                | < 1.0                | < 1.0                | < 1.0                | < 1.0                |
| < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               |
| < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               |
| < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               |
| < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               |
| < 0.05               | 0.26                 | < 0.05               | < 0.05               | < 0.05               | < 0.05               |
| < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               |
| < 0.05               | 0.43                 | < 0.05               | < 0.05               | < 0.05               | < 0.05               |
| < 0.05               | 0.38                 | < 0.05               | < 0.05               | < 0.05               | < 0.05               |
| < 0.05               | 0.3                  | < 0.05               | < 0.05               | < 0.05               | < 0.05               |
| < 0.05               | 0.34                 | < 0.05               | < 0.05               | < 0.05               | < 0.05               |
| < 0.05               | 0.39                 | < 0.05               | < 0.05               | < 0.05               | < 0.05               |
| < 0.05               | 0.21                 | < 0.05               | < 0.05               | < 0.05               | < 0.05               |
| < 0.05               | 0.27                 | < 0.05               | < 0.05               | < 0.05               | < 0.05               |
| < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               |
| < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               |
| < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               | < 0.05               |
| < 0.8                | 2.5                  | < 0.05               | < 0.8                | < 0.8                | < 0.8                |
| < 0.001              | < 0.001              | < 0.001              | < 0.001              | < 0.001              | < 0.001              |
| < 0.001              | < 0.001              | < 0.001              | < 0.001              | < 0.001              | < 0.001              |
| < 0.001              | < 0.001              | < 0.001              | < 0.001              | < 0.001              | < 0.001              |
| < 1.0                | < 1.0                | < 1.0                | < 1.0                | < 1.0                | < 1.0                |
| < 2.0                | < 2.0                | < 2.0                | < 2.0                | < 2.0                | < 2.0                |
| < 8.0                | < 8.0                | < 8.0                | < 8.0                | < 8.0                | < 8.0                |
| < 8.0                | < 8.0                | < 8.0                | < 8.0                | < 8.0                | < 8.0                |
| < 10                 | < 10                 | < 10                 | < 10                 | < 10                 | < 10                 |
| < 0.001              | < 0.001              | < 0.001              | < 0.001              | < 0.001              | < 0.001              |
| < 0.001              | < 0.001              | < 0.001              | < 0.001              | < 0.001              | < 0.001              |
| < 0.001              | < 0.001              | < 0.001              | < 0.001              | < 0.001              | < 0.001              |
| < 1.0                | < 1.0                | < 1.0                | < 1.0                | < 1.0                | < 1.0                |
| < 2.0                | < 2.0                | < 2.0                | < 2.0                | < 2.0                | < 2.0                |
| < 10                 | < 10                 | < 10                 | < 10                 | < 10                 | < 10                 |
| < 10                 | < 10                 | < 10                 | < 10                 | < 10                 | < 10                 |
| < 10                 | < 10                 | < 10                 | < 10                 | < 10                 | < 10                 |
| < 0.001              | < 0.001              | < 0.001              | < 0.001              | < 0.001              | < 0.001              |
| < 0.001              | < 0.001              | < 0.001              | < 0.001              | < 0.001              | < 0.001              |
| < 0.001              | < 0.001              | < 0.001              | < 0.001              | < 0.001              | < 0.001              |
| < 0.001              | < 0.001              | < 0.001              | < 0.001              | < 0.001              | < 0.001              |
| < 0.001              | < 0.001              | < 0.001              | < 0.001              | < 0.001              | < 0.001              |
| < 0.001              | < 0.001              | < 0.001              | < 0.001              | < 0.001              | < 0.001              |

CL = CLAY LOAM ZC = SILTY CLAY C= CLAY

**Visual Examination**

The samples were described as ranging from dark yellowish brown (Munsell colour 10YR 4/4) to very dark greyish brown (Munsell colour 10YR 3/2), moist to wet, slightly plastic to plastic, slightly calcareous HEAVY CLAY LOAMS, SILTY CLAYS and CLAYS. The samples ref. Locations 1, 4, 5, 6, 11 and 12 displayed structural degradation, with little or no defined soil structure. Samples ref. Locations 2, 3, 7, 9 and 10 displayed moderately to well-developed, fine to medium granular to sub-angular blocky structures. The samples were virtually stone free to slightly stony and no unusual odours, deleterious materials, roots or rhizomes of pernicious weeds.

Results of analysis should be read in conjunction with the report they were issued with

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Senior Associate



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|-------------|--------------------------------|
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| Project:    | Hoyland Common (AG-3080-19)    |
| Job:        | Topsoil Analysis (BS3882:2015) |
| Date:       | 16/03/2020                     |
| Job Ref No: | TOHA/20/9429/SS/Rev.1          |

| Sample Reference                                        |       |        | Location 7 | Location 8 | Location 9 | Location 10 | Location 11 | Location 12 |
|---------------------------------------------------------|-------|--------|------------|------------|------------|-------------|-------------|-------------|
| Sample Location                                         |       |        | TP1041     | TP1027     | TP1020     | TP1017      | TP1011      | TP1004      |
| Accreditation                                           |       |        |            |            |            |             |             |             |
| Clay (<0.002mm)                                         | %     | UKAS   | 38         | 41         | 57         | 44          | 50          | 37          |
| Silt (0.002-0.063mm)                                    | %     | UKAS   | 43         | 46         | 37         | 48          | 43          | 46          |
| Sand (0.063-2.0mm)                                      | %     | UKAS   | 19         | 13         | 6          | 8           | 7           | 17          |
| Texture Class (UK Classification)                       |       | UKAS   | C          | 2C         | C          | 2C          | C           | 2C          |
| Stones (2-20mm)                                         | % DW  | GLP    | 1          | 1          | 2          | 2           | 6           | 2           |
| Stones (20-50mm)                                        | % DW  | GLP    | 2          | 0          | 0          | 0           | 1           | 0           |
| Stones (>50mm)                                          | % DW  | GLP    | 0          | 0          | 0          | 0           | 0           | 0           |
| pH Value (1:2.5 water extract)                          | units | UKAS   | 6.9        | 7.2        | 6.1        | 6.2         | 6.8         | 7.3         |
| Electrical Conductivity (1:2.5 water extract)           | uS/cm | UKAS   | 67         | 107        | 53         | 67          | 84          | 74          |
| Electrical Conductivity (1:2 CaSO <sub>4</sub> extract) | uS/cm | UKAS   | 2008       | 2041       | 1994       | 1970        | 2058        | 2026        |
| Exchangeable Sodium Percentage                          | %     | UKAS   | 0.4        | 0.4        | 0.8        | 1.1         | 0.5         | 0.6         |
| Organic Matter (LOI)                                    | %     | UKAS   | 7.4        | 6.4        | 9.7        | 9.0         | 8.1         | 8.0         |
| Total Nitrogen (Dumas)                                  | %     | UKAS   | 0.27       | 0.22       | 0.38       | 0.31        | 0.32        | 0.32        |
| C : N Ratio                                             | ratio | UKAS   | 16         | 17         | 15         | 17          | 15          | 14          |
| Extractable Phosphorus                                  | mg/l  | UKAS   | 4          | 6          | 6          | 5           | 8           | 5           |
| Extractable Potassium                                   | mg/l  | UKAS   | 53         | 147        | 87         | 66          | 85          | 72          |
| Extractable Magnesium                                   | mg/l  | UKAS   | 327        | 213        | 261        | 224         | 407         | 319         |
| Total Arsenic (As)                                      | mg/kg | MCERTS | 15         | 13         | 17         | 17          | 14          | 14          |
| Total Cadmium (Cd)                                      | mg/kg | MCERTS | 0.3        | 0.2        | 0.4        | 0.3         | 0.3         | 0.2         |
| Total Chromium (Cr)                                     | mg/kg | MCERTS | 26         | 25         | 30         | 36          | 30          | 26          |
| Hexavalent Chromium (Cr VI)                             | mg/kg | MCERTS | < 4.0      | < 4.0      | < 4.0      | < 4.0       | < 4.0       | < 4.0       |
| Total Copper (Cu)                                       | mg/kg | MCERTS | 26         | 28         | 37         | 46          | 39          | 42          |
| Total Lead (Pb)                                         | mg/kg | MCERTS | 53         | 43         | 87         | 85          | 53          | 55          |
| Total Mercury (Hg)                                      | mg/kg | MCERTS | < 0.3      | < 0.3      | < 0.3      | < 0.3       | < 0.3       | < 0.3       |
| Total Nickel (Ni)                                       | mg/kg | MCERTS | 21         | 23         | 18         | 30          | 33          | 23          |
| Total Selenium (Se)                                     | mg/kg | MCERTS | 4          | 4          | 4          | 4           | 3           | 4           |
| Total Zinc (Zn)                                         | mg/kg | MCERTS | 110        | 88         | 97         | 120         | 140         | 110         |
| Water Soluble Boron (B)                                 | mg/kg | MCERTS | 1.5        | 1.1        | 1.6        | 1.7         | 1.3         | 1.1         |
| Total Cyanide (CN)                                      | mg/kg | MCERTS | < 1        | < 1        | < 1        | < 1         | < 1         | < 1         |
| Total (mono) Phenols                                    | mg/kg | MCERTS | < 1        | < 1        | < 1        | < 1         | < 1         | < 1         |
| Naphthalene                                             | mg/kg | MCERTS | < 0.05     | < 0.05     | 0.24       | 0.91        | < 0.05      | < 0.05      |
| Acenaphthylene                                          | mg/kg | MCERTS | < 0.05     | < 0.05     | < 0.05     | < 0.05      | < 0.05      | < 0.05      |
| Acenaphthene                                            | mg/kg | MCERTS | < 0.05     | < 0.05     | < 0.05     | 1.3         | < 0.05      | < 0.05      |
| Fluorene                                                | mg/kg | MCERTS | < 0.05     | < 0.05     | < 0.05     | 0.94        | < 0.05      | < 0.05      |
| Phenanthrene                                            | mg/kg | MCERTS | < 0.05     | < 0.05     | 0.36       | 3.8         | 0.28        | 0.25        |
| Anthracene                                              | mg/kg | MCERTS | < 0.05     | < 0.05     | < 0.05     | 0.35        | < 0.05      | < 0.05      |
| Fluoranthene                                            | mg/kg | MCERTS | < 0.05     | < 0.05     | 0.78       | 1.2         | 0.34        | 0.41        |
| Pyrene                                                  | mg/kg | MCERTS | < 0.05     | < 0.05     | 0.74       | 0.8         | 0.31        | 0.39        |
| Benzo(a)anthracene                                      | mg/kg | MCERTS | < 0.05     | < 0.05     | 0.6        | 0.38        | 0.23        | 0.27        |
| Chrysene                                                | mg/kg | MCERTS | < 0.05     | < 0.05     | 0.58       | 0.3         | 0.3         | 0.31        |
| Benzo(b)fluoranthene                                    | mg/kg | MCERTS | < 0.05     | < 0.05     | 0.66       | 0.23        | 0.25        | 0.34        |
| Benzo(k)fluoranthene                                    | mg/kg | MCERTS | < 0.05     | < 0.05     | 0.42       | 0.15        | 0.14        | 0.13        |
| Benzo(a)pyrene                                          | mg/kg | MCERTS | < 0.05     | < 0.05     | 0.55       | < 0.05      | 0.21        | 0.25        |
| Indeno(1,2,3-cd)pyrene                                  | mg/kg | MCERTS | < 0.05     | < 0.05     | 0.36       | < 0.05      | < 0.05      | < 0.05      |
| Dibenzo(a,h)anthracene                                  | mg/kg | MCERTS | < 0.05     | < 0.05     | < 0.05     | < 0.05      | < 0.05      | < 0.05      |
| Benzo(g,h,i)perylene                                    | mg/kg | MCERTS | < 0.05     | < 0.05     | 0.40       | < 0.05      | < 0.05      | < 0.05      |
| Total PAHs (sum USEPA16)                                | mg/kg | MCERTS | < 0.8      | < 0.8      | 5.7        | 10.3        | 2.1         | 2.4         |
| Aliphatic TPH >C5 - C6                                  | mg/kg | MCERTS | < 0.001    | < 0.001    | < 0.001    | < 0.001     | < 0.001     | < 0.001     |
| Aliphatic TPH >C6 - C8                                  | mg/kg | MCERTS | < 0.001    | < 0.001    | < 0.001    | < 0.001     | < 0.001     | < 0.001     |
| Aliphatic TPH >C8 - C10                                 | mg/kg | MCERTS | < 0.001    | < 0.001    | < 0.001    | < 0.001     | < 0.001     | < 0.001     |
| Aliphatic TPH >C10 - C12                                | mg/kg | MCERTS | < 1.0      | < 1.0      | < 1.0      | < 1.0       | < 1.0       | < 1.0       |
| Aliphatic TPH >C12 - C16                                | mg/kg | MCERTS | < 2.0      | < 2.0      | < 2.0      | < 2.0       | < 2.0       | < 2.0       |
| Aliphatic TPH >C16 - C21                                | mg/kg | MCERTS | < 8.0      | < 8.0      | < 8.0      | < 8.0       | < 8.0       | < 8.0       |
| Aliphatic TPH >C21 - C35                                | mg/kg | MCERTS | < 8.0      | < 8.0      | < 8.0      | < 8.0       | < 8.0       | < 8.0       |
| Aliphatic TPH (C5 - C35)                                | mg/kg | MCERTS | < 10       | < 10       | < 10       | < 10        | < 10        | < 10        |
| Aromatic TPH >C5 - C7                                   | mg/kg | MCERTS | < 0.001    | < 0.001    | < 0.001    | < 0.001     | < 0.001     | < 0.001     |
| Aromatic TPH >C7 - C8                                   | mg/kg | MCERTS | < 0.001    | < 0.001    | < 0.001    | < 0.001     | < 0.001     | < 0.001     |
| Aromatic TPH >C8 - C10                                  | mg/kg | MCERTS | < 0.001    | < 0.001    | < 0.001    | < 0.001     | < 0.001     | < 0.001     |
| Aromatic TPH >C10 - C12                                 | mg/kg | MCERTS | < 1.0      | < 1.0      | < 1.0      | < 1.0       | < 1.0       | < 1.0       |
| Aromatic TPH >C12 - C16                                 | mg/kg | MCERTS | < 2.0      | < 2.0      | < 2.0      | < 2.0       | < 2.0       | < 2.0       |
| Aromatic TPH >C16 - C21                                 | mg/kg | MCERTS | < 10       | < 10       | < 10       | < 10        | < 10        | < 10        |
| Aromatic TPH >C21 - C35                                 | mg/kg | MCERTS | < 10       | < 10       | < 10       | < 10        | < 10        | < 10        |
| Aromatic TPH (C5 - C35)                                 | mg/kg | MCERTS | < 10       | < 10       | 21         | 14          | < 10        | < 10        |
| Benzene                                                 | mg/kg | MCERTS | < 0.001    | < 0.001    | < 0.001    | < 0.001     | < 0.001     | < 0.001     |
| Toluene                                                 | mg/kg | MCERTS | < 0.001    | < 0.001    | < 0.001    | < 0.001     | < 0.001     | < 0.001     |
| Ethylbenzene                                            | mg/kg | MCERTS | < 0.001    | < 0.001    | < 0.001    | < 0.001     | < 0.001     | < 0.001     |
| p & m-xylene                                            | mg/kg | MCERTS | < 0.001    | < 0.001    | < 0.001    | < 0.001     | < 0.001     | < 0.001     |
| o-xylene                                                | mg/kg | MCERTS | < 0.001    | < 0.001    | < 0.001    | < 0.001     | < 0.001     | < 0.001     |
| MTBE (Methyl Tertiary Butyl Ether)                      | mg/kg | MCERTS | < 0.001    | < 0.001    | < 0.001    | < 0.001     | < 0.001     | < 0.001     |

ZC - SILTY CLAY C- CLAY

**Visual Examination**

The samples were described as ranging from dark yellowish brown (Munsell colour 10YR 4/4) to very dark greyish brown (Munsell colour 10YR 3/2), moist to wet, slightly plastic to plastic, slightly calcareous HEAVY CLAY LOAMS, SILTY CLAYS and CLAYS. The samples ref. Locations 1, 4, 5, 6, 11 and 12 displayed structural degradation, with little or no defined soil structure. Samples ref. Locations 2, 3, 7, 9 and 10 displayed moderately to well-developed, fine to medium granular to sub-angular blocky structures. The samples were virtually stone free to slightly stony and no unusual odours, deleterious materials, roots or rhizomes of pernicious weeds.

Results of analysis should be read in conjunction with the report they were issued with

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# **APPENDIX H**

## Hoyland Common, South Yorkshire

### Updated Coal Mining Risk Assessment

#### Introduction

The Phase 1 Coal Mining Risk Assessment (CMRA) produced by Applied Geology during January 2020 (Ref: AG3080-19-AJ77) came to a number of conclusions relating to risks based on the information available at that time. These were summarised at the time as follows:

| Coal Mining Issue                            | Zone | Yes | No | Risk Assessment                                                                                                                                             |
|----------------------------------------------|------|-----|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Recorded underground shallow mine workings   | A    |     | No | Negligible                                                                                                                                                  |
|                                              | B    |     | No | Negligible                                                                                                                                                  |
|                                              | C    | Yes |    | Low Risk: Potential influence of recorded workings in the Swallow Wood seam straddling the SE border.                                                       |
| Unrecorded underground shallow mine workings | A    | Yes |    | Low Risk: Possible workings in Swallow Wood seam beyond opencast highwall. Dunsil absent.                                                                   |
|                                              | B    | Yes |    | Dunsil Coal – Negligible<br>Swallow Wood – Significant risk. Present at shallow depth, known to have been worked in early 19 <sup>th</sup> C just off-site. |
|                                              | C    | Yes |    | Dunsil Coal – Negligible<br>Swallow Wood – Significant risk. Present at shallow depth, known to have been worked in early 19 <sup>th</sup> C just off-site. |
| Recorded Mine entries (shafts and adits)     | A    |     | No | Negligible                                                                                                                                                  |
|                                              | B    |     | No | Negligible                                                                                                                                                  |
|                                              | C    | Yes |    | Minor risks along the south eastern boundary from shafts 435399-009, -012 and -018.                                                                         |
| Unrecorded Mine entries (shafts and adits)   | A    | Yes |    | Very low risk in former mining areas                                                                                                                        |
|                                              | B    | Yes |    | Very low risk in former mining areas                                                                                                                        |
|                                              | C    | Yes |    | Very low risk in former mining areas                                                                                                                        |
| Mining geology (faults and fissures)         | A    |     | No | Negligible                                                                                                                                                  |
|                                              | B    |     | No | Negligible                                                                                                                                                  |
|                                              | C    |     | No | Negligible                                                                                                                                                  |
| Record of past mine gas emissions            | A    |     | No | Negligible                                                                                                                                                  |
|                                              | B    |     | No | Negligible                                                                                                                                                  |
|                                              | C    |     | No | Negligible                                                                                                                                                  |
|                                              | A    |     | No | Negligible                                                                                                                                                  |

| Coal Mining Issue                  | Zone | Yes | No | Risk Assessment                      |
|------------------------------------|------|-----|----|--------------------------------------|
| Recorded mining surface hazard     | B    |     | No | Negligible                           |
|                                    | C    |     | No | Negligible                           |
| Surface mining (opencast workings) | A    | Yes |    | Variable settlement across highwalls |
|                                    | B    | Yes |    | Variable settlement across highwalls |
|                                    | C    | Yes |    | Variable settlement across highwalls |

The conclusions showed 'Low' and 'Significant' risks relating to the potential for shallow depth unrecorded mine workings in the Swallow Wood seam.

### January 2020 Investigations

Since this report was issued a substantial ground investigation has been undertaken by Applied Geology. The investigation was designed to generate new data to supplement previous assessments and inform rational conclusions for the proposed large commercial type development of the site. It included investigations that would address the remaining concerns relating to historic mining risks.

The investigation has included 13 no. rotary cored boreholes, 25 no. rotary sonic boreholes and more than 120 no. trial pits and trial trenches, along with laboratory testing and monitoring. Along with Engineers' borehole records included in Appendix B, cross-sections have been produced (17 no. Referenced A-A to Q-Q inclusive) and are shown on reference Drawings BES-AG-HC-001 to 004 inclusive (Appendix A).

The quantity and quality of the data generated by the recent investigations are such that while there is scope for more detailed studies to be made where these are justified by the benefit of project objectives it is considered that the conclusions reached below are sufficient to provide realistic advice on issues relating to the historical mining legacies as they influence the final development proposals.

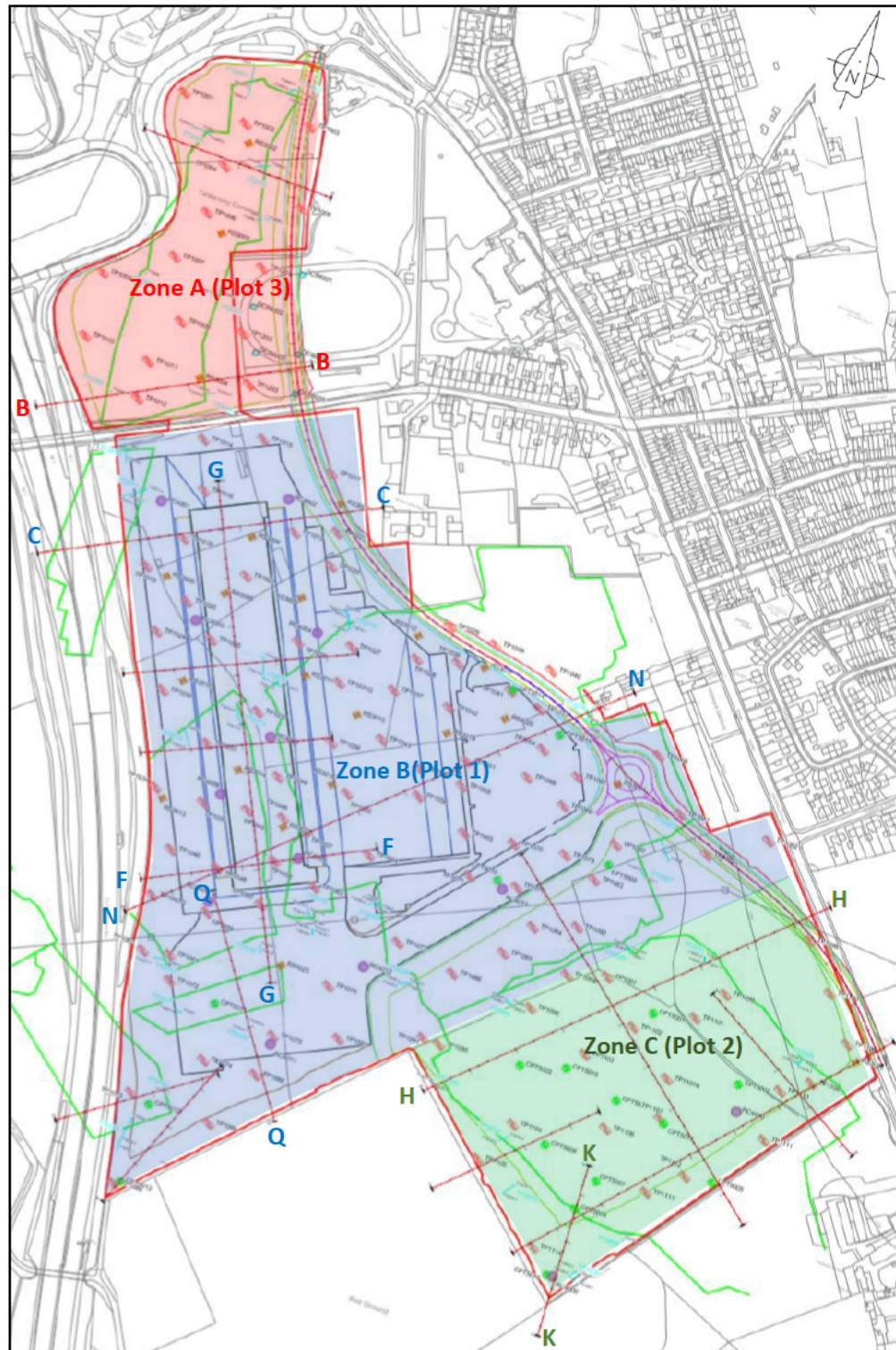
### Proximate Geological Sequence

As with the Phase 1 CMRA, the following summary considers the site to comprise 3 no. Zones as shown below.

A principal objective of the investigation that would help to mitigate potential mining risk was the establishment of the proximate geological sequence between the Swallow Wood coal seam and the Dunsil coal seam. In this respect, the following cross-sections are most relevant:

- Section B-B      Zone A/Plot 3      Representing the area north of Tankersley Lane.
- Section C-C      Zone B/Plot 1      Area of greatest Coal Mining risk.
- Section F-F      Zone B/Plot 1      Full geological sequence.

- Section G-G Zone B/Plots1 Longitudinal section.
- Section H-H Zone C/Plot 2 Upper coal sequence.
- Section K-K Zone C/Plot 2 Lower coal sequence.
- Section N-N Zone B/Plot 1 Through historic opencast areas.
- Section Q-Q Zone B/Plot 1 Lower coal sequence.

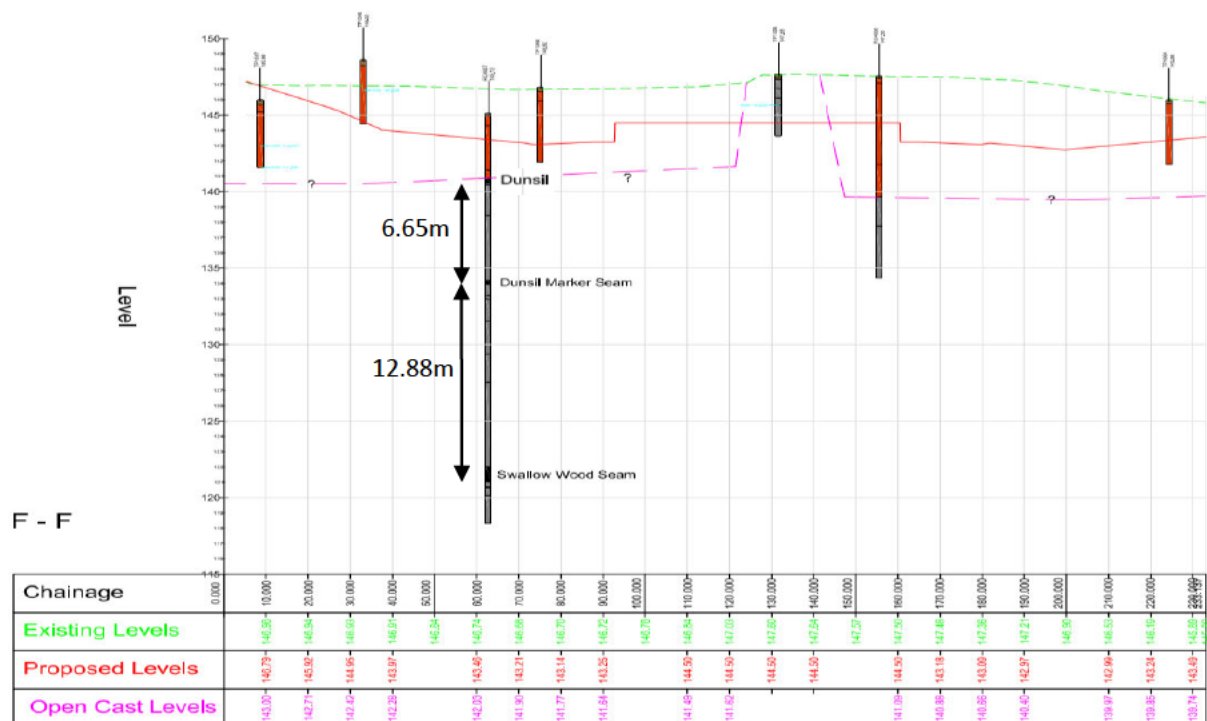


These cross-sections are supported by engineers' borehole records included in Appendix B, in particular, the following are most relevant:

- RC4003, RC4004, RC4007 and RC4009, which provide information on the separation between identifiable coal seams.

Sections B-B, C-C, F-F, and H-H, are orientated roughly west to east and perpendicular to the principal development orientation. Sections G-G and Q-Q run more closely from north to south through Zone B. Sections K-K and N-N are aligned through critical areas of Zone C.

An example of the selected geological cross-sections (Section F-F) referred to above is shown below. Other sections confirm general shallow strata dip of between about 3° and 5° (1 in 10 to 1 in 20), which is consistent with notes shown on the CA opencast plans.



Data assessment from the investigation, together with historically available information, has enabled the establishment of a more reliable coal seam based stratigraphy beneath the site.

| Seam Name               | Thickness m  | Distance to Dunsil Upper Leaf |
|-------------------------|--------------|-------------------------------|
| Unnamed Coal            | 0.30 to 0.60 | 10m to 12m (above Dunsil)     |
| Dunsil Upper Leaf       | c. 0.45      | n/a                           |
| Dunsil Lower Leaf       | 0.20 to 0.40 | Less than 1m                  |
| Unnamed 'Dunsil Marker' | 0.10 to 0.30 | 5.20 to 6.65m                 |
| Swallow Wood Upper Leaf | 0.30 to 1.00 | 17.20 to 19.50m               |

Swallow Wood Lower Leaf    0.13 to 0.14                      18.10 to 20.00m

*The base of the Dunsil Coal – Upper Leaf has been selected as the reference horizon for the purposes of the CMRA*

The unnamed coal seam (0.3m to 0.6m thick) shown at the top of the sequence – see Cross-sections H-H and I-I – was encountered in exploratory holes RS3025, TP1093, TP1100, TP1109, TT2027 and also in historic opencast coal recovery records (Ref CA NE169). This has enabled an estimate of between 10m and 12m as the separation between the base of the unnamed seam and the base of the Dunsil Upper Leaf. It plays no part in the conclusion of this CMRA, being too thin for any reasonable threat of unrecorded mining. Where encountered during enabling groundworks then the remaining outcrop should be sealed as appropriate.

It should also be noted that the ‘Dunsil Marker’ is a hitherto unnamed, very thin coal seam, but one which has been found consistently some 6m below the base of the Dunsil and approximately 12m above the base of the Swallow Wood Upper Leaf. It therefore constitutes a useful marker horizon, which where encountered in isolation can be used to predict depth to Swallow Wood. Like the unnamed seam above the Dunsil, the Dunsil Marker seam is too thin to have been subject to unrecorded underground workings.

The strata between the coal seams includes mudstones, siltstones and sandstones. Some of these may also constitute marker horizons; however, these have not been studied in detail.

### **Risk Assessment of Unrecorded Shallow Mine Workings**

An important conclusion from the closer definition of the proximate geology is that there is more than 17m of cover between the Swallow Wood and Dunsil.

It was concluded in the Phase 1 CMRA that there was no risk of recorded or unrecorded underground mine workings in the Dunsil beneath this site, while the Dunsil has been extracted by opencast methods over large areas. It therefore follows that there will be a minimum of 17m of solid cover to the Swallow Wood up-dip from the Dunsil outcrop.

The further confidence in Swallow Wood seam thickness gained from the site investigation, along with the recorded thickness of cover is sufficient to have confidence in the mitigation of the risk of time independent ground surface instability caused by upward migration of voids from unrecorded workings.

Notwithstanding the above, the investigation has not revealed any positive evidence of any type of underground workings within the Swallow Wood coal seam.

### **Risk Assessment of Recorded Mine Shafts**

A search, by trial pit excavation, was made for recorded shaft 435399-018, which is believed to be located close to the southern boundary of the site. Evidence for this shaft was not found, and it is presumed that the actual position is on the outside of the site boundary.

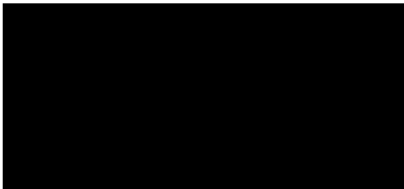
**Revised CMRA**

Base on a preliminary review of the results of the recent site investigation, the CMRA findings can be revised as shown below.

| Coal Mining Issue                            | Zone | Yes | No | Risk Assessment                                                                                                                                                                                        |
|----------------------------------------------|------|-----|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Recorded underground shallow mine workings   | A    |     | No | Negligible                                                                                                                                                                                             |
|                                              | B    |     | No | Negligible                                                                                                                                                                                             |
|                                              | C    |     | No | Negligible: Former risk in the Swallow Wood seam straddling the SE boarder mitigated by the findings of Borehole RC4009.                                                                               |
| Unrecorded underground shallow mine workings | A    |     | No | Negligible: Dunsil absent.<br>No evidence of workings in Swallow Wood seam beyond opencast highwall.                                                                                                   |
|                                              | B    |     | No | Negligible: Dunsil Coal<br>Swallow Wood – while present at shallow depth, between the Swallow Wood opencast and Dunsil outcrop. Further study of SI data has shown no evidence of unrecorded workings. |
|                                              | C    |     | No | Dunsil Coal – Negligible<br>Swallow Wood – Negligible. Sufficient solid cover present to mitigate risk even if workings are present.                                                                   |
| Recorded Mine entries (shafts and adits)     | A    |     | No | Negligible                                                                                                                                                                                             |
|                                              | B    |     | No | Negligible                                                                                                                                                                                             |
|                                              | C    | Yes |    | Low risk along the south eastern boundary from shafts 435399-009, -012 and -018. – Further targeted site investigations have not found these. Vigilance recommended in this area during groundworks    |
| Unrecorded Mine entries (shafts and adits)   | A    | Yes |    | Very low risk in former mining areas                                                                                                                                                                   |
|                                              | B    | Yes |    | Very low risk in former mining areas                                                                                                                                                                   |
|                                              | C    | Yes |    | Very low risk in former mining areas                                                                                                                                                                   |
| Mining geology (faults and fissures)         | A    |     | No | Negligible                                                                                                                                                                                             |
|                                              | B    |     | No | Negligible                                                                                                                                                                                             |
|                                              | C    |     | No | Negligible                                                                                                                                                                                             |
| Record of past mine gas emissions            | A    |     | No | Negligible                                                                                                                                                                                             |
|                                              | B    |     | No | Negligible                                                                                                                                                                                             |
|                                              | C    |     | No | Negligible                                                                                                                                                                                             |

| Coal Mining Issue                  | Zone | Yes | No | Risk Assessment                                                                        |
|------------------------------------|------|-----|----|----------------------------------------------------------------------------------------|
| Recorded mining surface hazard     | A    |     | No | Negligible                                                                             |
|                                    | B    |     | No | Negligible                                                                             |
|                                    | C    |     | No | Negligible                                                                             |
| Surface mining (opencast workings) | A    | Yes |    | Variable settlement across highwalls. Sufficient data available now to mitigate risks. |
|                                    | B    | Yes |    | Variable settlement across highwalls. Sufficient data available now to mitigate risks. |
|                                    | C    | Yes |    | Variable settlement across highwalls. Sufficient data available now to mitigate risks. |

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PS Geotech 4 June 2020

# APPENDIX I

| Risk ID | Hazard                                                                                | Consequences                                                                                                                                                                                                                                                                    | Qualitative Risk Level (High /Medium/Low/ Negligible) | Comments & Possible Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|---------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1       | Uncertain or variable thickness of Made Ground – relating to the opencast backfilling | <ul style="list-style-type: none"> <li>Increased construction costs</li> <li>Programme delays</li> <li>Construction difficulties</li> </ul> <p>All due to effects of excessive total and differential settlements (applies to foundations, floor slabs, roads and services)</p> | High                                                  | <p>SI shows depth of opencast backfill to range between &lt;2m and 12m depth. However, depths are generally as predicted from abandonment plans. Some variation in high wall locations.</p> <p>Significant thickness of engineered fill in Plot 2 above the opencast backfill will induce significant settlements. Ground improvement needed especially on Plots 2 and 3 where no fixed building layout or piled solution permitted. Roads and services (especially drainage) to be designed to accommodate some movements.</p> |
| 2       | Uncertain or variable and in places significant depth to competent founding strata    | <ul style="list-style-type: none"> <li>Increased foundation costs</li> <li>Programme delays;</li> <li>Construction difficulties - variable foundation solutions needed</li> </ul>                                                                                               | High                                                  | <p>SI shows depth of opencast backfill to range between &lt;2m and 12m depth. However, depths are generally as predicted from abandonment plans. Some variation in high wall locations.</p> <p>Over-excavation and re-engineering of soils a possible solution for Plot 1. Ground improvement for Plot 3 band drains and surcharging). Ground improvement and placement of engineered fill for plot 2 to meet Client's required loading and settlement tolerances.</p>                                                          |
| 3       | Possible unrecorded coal and/or ironstone workings                                    | <p>Increased construction costs and programme delays due to:</p> <ul style="list-style-type: none"> <li>Need to drill and grout to stabilise old workings;</li> <li>Potential pathway for mine gas.</li> </ul>                                                                  | Negligible                                            | <p>SI evidence does not suggest coal mined at shallow depth (other than by opencast). Next worked seam at depth below the site is significantly greater than 10 x seam thickness below the other shallow opencast worked seams.</p>                                                                                                                                                                                                                                                                                             |
| 4       | Possible bell pits at southern end of site                                            | <ul style="list-style-type: none"> <li>Increased construction costs and programme delays for stabilisation works.</li> </ul>                                                                                                                                                    | Negligible                                            | <p>It is believed that all bell pits were excavated for ironstone south of the site. Any bell pits within the site boundary would have been excavated by the opencast works.</p>                                                                                                                                                                                                                                                                                                                                                |
| 5       | Possible presence of unrecorded mine shafts                                           | <p>Increased construction costs and programme delays due to:</p> <ul style="list-style-type: none"> <li>Risk of sudden collapse of ground;</li> <li>Pathway for mine gas;</li> <li>Need to drill and grout and/or cap – increased construction costs.</li> </ul>                | Low                                                   | <p>No mine shafts recorded on site, except two possible old bell pits in the SE corner – see above.</p> <p>Can be encountered anywhere. Maintain vigilance during siteworks and report unexpected features to a competent person.</p>                                                                                                                                                                                                                                                                                           |

|   |                                                                                                                                                |                                                                                                                                                                                                                                                                                    |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|---|------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|   |                                                                                                                                                | Possible sterilisation of parts of the site with respect to siting of buildings and key infrastructure.                                                                                                                                                                            |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 6 | Intact coal at foundation level                                                                                                                | Increased construction costs and programme delays due to: <ul style="list-style-type: none"> <li>• Additional excavation;</li> <li>• disposal;</li> </ul>                                                                                                                          | Medium | It is generally recommended that coal is removed within influencing distance of shallow foundations ~ c.1.0m. where encountered coal should be removed and replaced with impermeable fill (clay emulsion). Surplus coal can be sold, disposed off-site or re-used within the works as appropriate.                                                                                                                                                                                                             |
| 5 | Location and extent of geological faulting (variation in weathering profile and strength as a result of faulting and other geological factors) | Increased construction costs and programme delays due to: <ul style="list-style-type: none"> <li>• Need to deal with groundwater-faults could be pathway for groundwater</li> <li>• Possible implications for reduced slope stability if fault intersected in cut slope</li> </ul> | Low    | Desk study and SI findings do not indicate any major faulting. Slopes to be designed accordingly for ground conditions encountered.                                                                                                                                                                                                                                                                                                                                                                            |
| 6 | Unexpected or high groundwater conditions, including water ingress from land drains and un-mapped surface drainage                             | Increased construction costs and programme delays due to: <ul style="list-style-type: none"> <li>• Water ingress during cut operation</li> <li>• Softening of strata being excavated</li> <li>• Reduced stability of slopes in areas of cut</li> </ul>                             | Medium | SI suggests variable groundwater levels, especially within opencast backfill materials. Ground improvement to take account of groundwater levels. Some degree of moisture modification to be assumed during earthworks. Temporary and permanent drainage measures to be incorporated, especially at cut slopes. Need to deal with water currently controlled by surface and land drainage systems which will be excavated as part of the cut. Slope design to take account of worst likely groundwater levels. |
| 7 | Ground gas or mine gas                                                                                                                         | <ul style="list-style-type: none"> <li>• Increased construction costs due to requirement for gas protection systems</li> </ul>                                                                                                                                                     | Medium | SI suggests CS-2 conditions so basic passive gas protection measures likely to be required.                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 8 | Sulphate-rich, potentially pyritic ground and acidic conditions                                                                                | <ul style="list-style-type: none"> <li>• Increased costs for buried concrete</li> <li>• Increased costs and construction difficulties (earthworks) if strata unsuitable for lime modification?</li> </ul>                                                                          | High   | SI suggests DS-2 and AC-3z conditions. Buried concrete to be specified for these conditions. Significant number of tests undertaken - sulphates generally low enough for use of lime.                                                                                                                                                                                                                                                                                                                          |

|    |                                                                           |                                                                                                                                                                                                                                                                                                                        |                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|----|---------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |                                                                           |                                                                                                                                                                                                                                                                                                                        |                | Contractor to do lime suitability testing/lab trials.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 9  | Unsuitable soils for re-use as engineered fill (for geotechnical reasons) | Increased construction costs and programme delays due to: <ul style="list-style-type: none"> <li>• Additional measures needed to render cut materials suitable for use as engineered fill</li> <li>• Disposal costs if unsuitable (e.g. too organic, coal)</li> <li>• Possible double handling of materials</li> </ul> | High           | A significant proportion of the soils to be excavated are wetter than optimum and a few are drier than optimum, so moisture modification will be required. Earthworks Contractor to do lime suitability testing/lab trials. Oversize materials are present in the opencast backfill and areas of excavation in bedrock will generate significant quantities of further over size materials. As this will include siltstones, sandstones and mudstones, some crushing and screening will be required to render the materials suitable for use as engineered fill.                                                             |
| 10 | Variability of suitable soils for re-use as engineered fill               | Increased construction costs and programme delays due to: <ul style="list-style-type: none"> <li>• Variability in geotechnical properties may mean different compaction techniques and/or different compaction plant</li> <li>• Possible double handling of materials</li> </ul>                                       | Medium to high | SI shows variable geotechnical properties of both opencast backfill and in situ coal measures strata, particular significant variation in maximum dry density, optimum moisture content, liquid limit and grading. Some liquid limits are >50%. Careful excavation of cut materials and segregation of suitable materials into different classes of material will be required. Appropriate selection of compaction plant. Appropriate and detailed earthworks specification to be prepared with suitable testing criteria and acceptance criteria possibly based on Trenter & Charles (+ relevant BS EN & HA specifications) |
| 11 | Difficult excavation of rock strength materials in areas of cut           | Increased construction costs, construction difficulties and programme delays due to: <ul style="list-style-type: none"> <li>• Reduced rate of excavation</li> <li>• Additional plant needed</li> <li>• Increase in oversize materials for re-use</li> </ul>                                                            | High           | SI indicates excavation of rock strength material will be required. Crusher and screen will probably be needed on site to process materials.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 12 | Presence of known shallow coal seams or coal within backfill materials    | Increased construction costs and programme delays due to coal being geotechnically unsuitable and potentially combustible. Increased disposal costs if can't be carefully excavated and sold                                                                                                                           | Medium         | Most shallow coal worked by opencast. SI shows some potentially combustible seams still present around periphery of opencast areas, some of which will be excavated. Laboratory testing of opencast backfill where contains some coal shows low calorific value.                                                                                                                                                                                                                                                                                                                                                             |

|    |                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                               |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|----|-----------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                               |      | Over excavation of seams locally required where within 1m of underside of proposed foundation level.<br>Careful excavation of coal to prevent cross-contamination and maximise its likelihood of being sold (rather than disposed of).                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 13 | Slope stability, particularly where placing significant engineered fill over uncontrolled opencast backfill materials | <p>Increased construction costs, construction difficulties and programme delays due to collapse of engineered fill slope during construction.</p> <p>Third party claims if global slope failure and possible heave of ground outside site boundary</p> <p>Impact on infrastructure at toe and crest of slopes due to either excessive settlement, heave or slope failure.</p> | High | <p>Slopes to be designed on conservative parameters for highly variable opencast backfill material.</p> <p>Amend slope angles or use of measures such as shear keys, ground improvement where marginal stability at preferred slope angles.</p> <p>Adequate drainage will be required for toes of slopes and, for some slopes, also along the crests.</p> <p>Possible slow rate of placing engineered fill to avoid failure during construction.</p> <p>Avoid placing services along toes and crests in embankment slopes</p> <p>Benching of ground following topsoil strip beneath embankments may be required.</p> <p>Detailed slope stability assessments being undertaken to steer appropriate measures.</p> |
| 14 | Contamination within opencast backfill materials                                                                      | Increased construction costs and programme delays due to materials being unsuitable for re-use on site and need to either dispose off-site or on-site remediation and need for double handling.                                                                                                                                                                               | Low  | <p>SI suggests no contamination present.</p> <p>Include procedures on measures to deal with unexpected contamination in earthworks specification and/or contract documents.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

## Risk categories:

- Negligible: Geohazards that might have unacceptable impact on the development, are unlikely to be present, or, have been proven to be too far from or too deep beneath the site to have a significant influence.
- Low Risk: Geohazards may be present but are unlikely to have an unacceptable impact on the development.
- Medium Risk: Geohazards are probably present and might have an unacceptable impact on the development. Therefore, remedial measures or appropriate design may be necessary to reduce the risks.
- High Risk: Geohazards probably or certainly present and likely to have an unacceptable impact on the development. Remedial measures or appropriate design are likely to be necessary to reduce the risks to acceptable levels.