



Coal Mining Risk Assessment

Longley Concrete, Dewsbury

August 2017

Waterman Infrastructure & Environment Limited


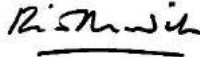
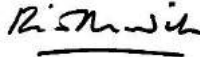
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Document Reference: WIE13350-100-R-1.1.2-Mining
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Quality Assurance – Approval Status

This document has been prepared and checked in accordance with Waterman Group's IMS (BS EN ISO 9001: 2015, BS EN ISO 14001: 2015 and BS OHSAS 18001:2007)

Issue	Date	Prepared by	Checked by	Approved by
First	August 2017	Andrew Mould Principal Consultant	Richard Meredith Associate Director	Richard Meredith Associate Director
				

Comments

Comments



Disclaimer

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We disclaim any responsibility to the client and others in respect of any matters outside the scope of the above.

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1. Introduction

1.1 Objectives and Brief

Waterman Infrastructure & Environment Limited was instructed to undertake a Coal Mining Risk Assessment for the proposed redevelopment of Longley Concrete, Dewsbury. The main objectives of the report are to:

- Undertake a desktop review of available, up to date, site specific information;
- Identify and assess the risks (individually and cumulatively) to the proposed development;
- Set out a mitigation strategy and show how the coal mining legacy has influenced the development; and,
- Demonstrate to the Local Planning Authority that the Site is, or can be made, safe.

This assessment has been undertaken in general accordance with the Coal Authority Guidance Note on the Coal Mining Risk Assessment Report Structure, January 2011. The report also provides a conceptual model based on the available information relating to the Site and an evaluation of potential risks and recommendations relating to any necessary mitigation.

The assessment was undertaken in accordance with the scope agreed between Waterman and Longley Concrete Ltd., as documented in Waterman's fee proposal, and with Waterman's standard Terms of Appointment.

1.2 The Proposed Development

The proposed development comprises the construction of a new pre-cast concrete plant in the north west of the existing Longley Concrete site. The development will include the demolition of an existing structure in the centre of the Site to create space for the new structure. The proposed development is shown on Figure A2 in Appendix A.

1.3 Limitations

The information contained in this report is based on the findings of a desktop review of the available information, including a Phase 1: Desk Study prepared by Solmek Ltd. (Ref: S1705011, May 2017), BGS exploratory hole records and geological maps, and Coal Authority mine abandonment plans.

The ground conditions reported are summarised from historical BGS exploratory hole records only. The ground conditions relate only to the point of excavation at the time of excavation and do not necessarily guarantee a continuation of the ground conditions throughout the non-inspected area of the site. Whilst such exploratory holes would usually provide a reasonable indication as to the general ground conditions, these cannot be determined with complete certainty.

Waterman has endeavoured to assess all information provided to them during this investigation, but makes no guarantees or warranties as to the accuracy or completeness of this information.

The scope of this investigation does not include an assessment for the presence of asbestos containing materials within or below buildings at the site.

The conclusions resulting from this study are not necessarily indicative of future conditions or operating practices at or adjacent to the site.

2. Site Setting

2.1 Site Location

The Site is located at National Grid Reference 423110, 419920 on Ravensthorpe Road, Dewsbury. The Site lies approximately 2.5km to the south west of Dewsbury town centre, close to Ravensthorpe Railway Station. The site location is shown on Figure 1 in Appendix A.

2.2 Site Description

The site description below is taken from the Solmek Phase 1: Desk Study and is based on a site inspection undertaken by Solmek on the 12th May 2017:

“The Site is an active industrial site, involved in the production of pre-cast concrete products. The Site has a mostly flat and level topography, with the exception of the western portion of the site, which is elevated above the Site, with a road connecting this to the remainder of the site. There are numerous buildings on the Site, with the remainder of the area consisting of hardstanding.

The westernmost area of the Site consists of a refuse tip area, which is connected to the remainder of the Site by a road. An office building is located in the central area of the Site, with car parking to the south and west. The northern portion of the Site consists of buildings and areas of hardstanding, including two long buildings and a large metal hopper. The north-western corner of the Site is used for storage of products, with the area east of this the location of the proposed new building”.

An approximately 3m high retaining wall is present between the raised area in the west of the Site and the main area of the Site.

2.3 Site Surroundings

“The Site is bordered to the north by railway land, to the east by small buildings and fields, to the south by residential properties and to the west by neighbouring commercial properties”.

3. Review of Desktop Sources

The Site is located in the South Yorkshire Coalfield and the Coal Authority Gazetteer for England and Wales identifies the Site as being potentially affected by mining. As such the Site requires a Coal Authority Mining report.

In addition, the western area of the Site is identified as being in a Coal Mining Development High Risk Area, which is an area where the Coal Authority considers mining risks to be significant. For all new planning applications in a Coal Mining Development Referral Area, a Mining Risk Assessment is required for submission to the Local Planning Authority.

Desktop information has been collated and assessed regarding potential mining risk at the site. The Mining Report, extracted from the Solmek Phase 1: Desk Study, is included in Appendix B, BGS exploratory hole logs are in Appendix C and the historical maps, also extracted from the Solmek Phase 1: Desk Study, are included in Appendix D, the findings are summarised in the following table.

Table 1: Mining Information – Desktop Sources

Information Source	Reference	Conclusions / Significance
1:10,000 scale BGS map	Sheets SE21NW, SE22SW	<p>The generalised vertical section identifies 5No. seams of coal either cropping out or present at shallow depths beneath the Site.</p> <p>The seams are named as:</p> <ul style="list-style-type: none"> • The Middleton Main seam (0.2m – 1.0m thick); • The Wheatley Lime coal seam (0.7m – 1.2m thick); • The Middleton Eleven Yards seam (0.0m – 1.1m thick); • The Blocking Coal seam (0.2m – 0.6m thick); and, • The Top Lousy Coal seam (0.0m – 0.6m thick). <p>Coal seams present at greater depth than the Top Lousy Coal seam include the Crow Coal, Black Bed and the Better Bed seams, however these are present at significant depth in the vertical section (>100m bgl), hence these seams are not considered to represent a stability risk.</p> <p>The sequence of coal subcrops indicates that the bedrock geology dips to the south and east.</p> <p>A significant thickness of sandstone, identified as the Falhouse Rock, is identified on the vertical section between the Middleton Eleven Yards seam and the Blocking Coal.</p> <p>An area of “Made Ground - artificial raised ground, including embankments, spoil-tips and landfills” is identified in the west of the Site.</p> <p>The Site is not shown to be affected by faulting that could transect the workings.</p>
BGS borehole records	SE22SW28, SE21NW21/B, SE21NW21/G, SE21NW21/H, SE21NW23, SE21NW222, SE22SW96	<p>7No. BGS borehole records were consulted; these were from deep exploratory holes to the N, E, W and SE of the Site.</p> <p>SE22SW28, drilled in 1980 and located on the northern boundary of the Site, identifies a thin layer of topsoil, but no Made Ground. River Terrace Deposits of sand and gravel, are identified to 9.4m bgl. Weathered Mudstone is shown to rockhead at 9.9m bgl where the borehole was terminated.</p>

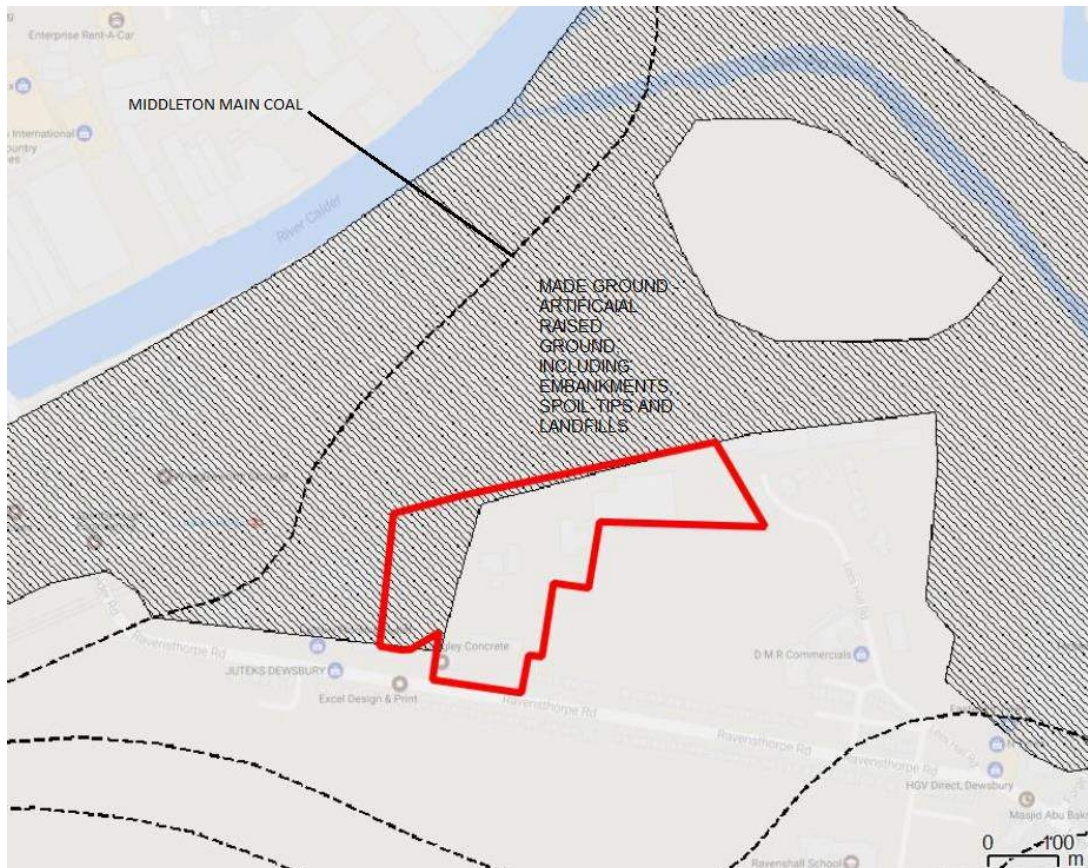
Information Source	Reference	Conclusions / Significance
		<p>SE21NW21/B, SE21NW21/G and SE21NW21/H are located adjacent to the eastern site boundary. All of them identify Made Ground of between 4.5m and 7m in thickness, predominantly comprising ash and brick. Rockhead is shown to be at between 9m and 11m bgl in this area.</p> <p>SE21NW23, SE21NW222 and SE22SW96 are records relating to nearby collieries, Calder, Ingham's and Ravenslodge Collieries. The records indicate that the Middleton Main seam (labelled as the New Hards seam on the BGS logs) is between 0.94m and 1.02m in the Ingham's and Ravenslodge collieries.</p>
<p>Coal Mining Search Report by David Bellis Consulting Surveyors</p>		<p>The Coal Mining Search Report contains the following comments relating to mining:</p> <ul style="list-style-type: none"> • The site is in the likely zone of influence from workings in 3No. seams of coal at depths of 23m to 185m, last worked in 1917; • There are no known mine entries within or close to (<20m) the boundary of the property; • The site has not been affected by open cast mining according records held by the Coal Authority; • No evidence of coal mining related subsidence claims in relation to the subject property since 31st October 1994. <p>It should be noted that this document is not a Coal Authority Mining Report.</p>
<p>Coal Authority mine abandonment plans</p>	<p>GCR56, FGB550, NE108, FGB814, GCR51, 11057, 10527</p>	<p>The CA were consulted with regard to mine abandonment plans. A number of plans indicated workings within the Black Bed at significant depth beneath the Site. The workings appear to date from 1913 – 1915.</p> <p>Two plans, one from 1833 and the other from 1926, indicate workings within the shallow seams in the vicinity of the Site. The 1926 plan identifies workings in the Middleton Little Coal to the south of the Site. This seam is not anticipated to be present beneath the Site.</p> <p>The 1833 plan shows workings, thought to be within the Middleton Main Coal, beneath the south and east of the Site, as shown on Figure A2 in Appendix A.</p> <p>Coal Authority records indicate shafts to the south east of the Site, approximately 100m from the south eastern site boundary. Two of these shafts are indicated on the mine abandonment plans, indicated to be an "engine pit" and a "bye pit".</p>
<p>Historical Ordnance Survey mapping</p>		<p>Historical OS Plans include the following details on mining features:</p> <ul style="list-style-type: none"> • Evidence of stockpiled materials in the west of the Site from 1930s onwards. The extent of these stockpiles appears to be reflected in the designation of the Coal Authority Development High Risk Area; • Calder New Pit is identified on historical maps dating to 1908 onwards approximately 400m west of the Site; • Crowley Colliery, later Ingham's Colliery is identified on historical maps dating to 1855 onwards approximately 1.4km south east of the Site; • Ravenslodge Colliery is identified on historical maps dating to 1894 onwards approximately 800m north east of the Site;

Information Source	Reference	Conclusions / Significance
The relevant maps are reproduced in Appendix D.		

4. Anticipated Ground Conditions

The Conceptual Site Model, derived from BGS records (Appendix B) for the area, is detailed on the cross-section (Fig. A3) in Appendix A and is summarised here.

Figure 1: Ground Conditions



Source: Solmek Phase 1: Desk Study

4.1 Made Ground

Given the historical development of the Site, it is anticipated that a layer of Made Ground will be present across the Site. Also, material associated with the former stockpiles identified on the historical maps may still be present at the Site. This material is likely to have been re-graded during the construction of the existing structures and areas of hardstanding at the Site. Existing raised areas, both on-site and off-site, to the west of the Site are likely to comprise of this tipped material. BGS borehole records dating to 1964 identify up to 7m of Made Ground, predominantly comprising ash and brick, to be present on land to the east of the Site.

4.2 Drift Deposits

BGS mapping indicates a layer of River Terrace Deposits, comprising gravelly sand and sandy gravel, is present across the majority of the Site. Drift deposits are shown to absent in an area in the south west corner of the Site. BGS borehole records to the north and east of the Site indicate that the River Terrace Deposits are between 9m and 11m thick in the surrounding area.

4.3 Solid Deposits

The whole Site is underlain by the Pennine Lower Coal Measures, comprising mudstone, siltstone and sandstone. BGS records indicate that rockhead is at between 9m and 11m bgl in the vicinity of the Site. The following table contains a summary of the generalised vertical section contained on the 1:10,000 scale BGS maps, Sheets SE21NW and SE22SW.

Table 2: Summary of Solid Geology / Coal Seams

Coal Seam / Stratum	Approx. Thickness	Depth of Seam Below Middleton Main	Comments
Middleton Main (Coal)	0.2m – 1.0m	-	Shown sub-cropping approximately 120m west of the Site. Shown dotted, indicating uncertain location.
Interbedded sandstone and mudstone	27m	-	-
Wheatley Lime (Coal)	0.7m – 1.2m	27m	Shown sub-cropping approximately 500m west of the Site. Shown dotted, indicating uncertain location.
Undifferentiated (Mudstone)	9m	-	-
Middleton Eleven Yard (Coal)	0.0m – 1.1m	36m	-
Mudstone and Falhouse Rock (Sandstone)	27m	-	-
Blocking Coal	0.2m – 0.6m	63m	-
Interbedded sandstone and mudstone	39m	-	-
Top Lousy (Coal)	0.0m – 0.6m	102m	-

5. Mining Risk Assessment

The Mining Report for the Site identifies 3No. coal seams at depths of between 23m and 185m below ground level. These seams were last worked in 1917. The report does not identify any mine entries on the Site. Historical maps indicate the possible presence of tipped material in the west of the Site. Based on the available information, it is considered that the site-specific ground conditions and/or coal mining risks that could compromise the safety and stability of the development are as follows:

5.1 Subsidence

The Middleton Main coal seam, as indicated on the BGS maps and borehole logs, is likely to be present at relatively shallow depths beneath the Site. The Mining Report included in the Solmek Phase 1: Desk Study indicates that the seam is at approximately 23m beneath the Site. The Coal Authority mine abandonment plans indicate that this shallow seam has been exploited beneath a significant proportion of the Site. Unrecorded shallow mining may have occurred beneath other areas of the Site in the more distant past when detailed mining records were not made. It is considered that subsidence related to these shallow seams may impact on any future development unless the risks are further assessed by intrusive investigation and appropriately mitigated.

The proposed development is unlikely to be impacted by coal mining related subsidence associated with any of the deeper seams due to their significant depth below ground level and the substantial thickness of overlying solid cover.

5.2 Tipped Material Instability

Given the historic nature of the tipping, it is considered that any significant settlement of backfilled materials is likely to have occurred by now, however, construction activities could potentially cause further settlement, including inundation settlement. This will need to be considered in the design of temporary and permanent works, including the design of foundations, access roads and permanent road surfacing.

Depending upon the depth of the backfilling, piled foundations may be required for the proposed structure. These will be found in the top few metres of the natural bedrock.

A raised area, likely to comprise these tipped materials, is present, on-site and off-site, adjacent to the western site boundary. It is recommended that loading of this area is avoided during the proposed construction works.

5.3 Mine Shaft Collapse

The Mining Report does not identify any mine entries on, or within 20m of, the Site. However, the potential for unrecorded shafts or bell pits to be present on site should not be ruled out, particularly given the mining activity identified at the Site. Therefore, a watching brief should be undertaken throughout the duration of the groundworks to ensure that no historical mining features are identified, and if they are encountered, that they are appropriately remediated.

5.4 Piled Foundations

Should piled foundations or piled retaining walls etc. be proposed as part of the development there may be a risk of settlement should the toe depth of piles be at a depth where the zone of loading and the zone of stress influence are close to broken or poor quality ground, such as worked coal seams.

6. Mitigation Strategy

It is considered that the following sections adequately demonstrate to the Local Planning Authority that the Site can be made safe and stable, to meet the requirements of the National Planning Policy Framework with regard to remediating and mitigating unstable land. The risks are reasonably well understood and it is considered that the development can proceed safely.

It is felt that standard construction techniques will mitigate any residual risks which apply to the Site. e.g. anomalies / shafts will be filled and capped and any shallow workings will be drilled & grouted (if necessary) in line with the CIRIA document, SP32 “Construction over Abandoned Mine Workings”.

Our recommended mitigation strategy is:

- Carry out ground investigation, as part of the detailed geotechnical design;
- Consider the final layout of the development and the individual buildings, in conjunction with the site geology and the ground model;
- Consider the proposed foundations in connection with the geology and the ground model;
- Consider the recommendations in the Construction Industry Research and Information Association (CIRIA) Special Publication 32 “Construction over Abandoned Mine Workings”, which is due to be replaced by CIRIA’s Abandoned Mine Workings Manual (RP940).

A Coal Authority Permit for Intersecting, Disturbing or Entering Coal will be required for all works at the Site that relate to the coal seams beneath the Site, including any ground investigation and treatment of mine workings and mine entries.

6.1 Ground Investigation

It is recommended that ground investigation is undertaken to determine the presence of mine workings at shallow depths. The desktop information indicates the potential presence of worked seams in the underlying Pennine Lower Coal Measures. Rotary drilling to prove the Middleton Main seam would be required beneath the proposed building footprint in order to assess the risk associated with shallow coal mining.

6.2 Mine Workings Treatment

Should mine workings be identified at shallow depths in the supplementary ground investigation it is considered likely that the preferred mitigation strategy will be to systematically grout any voids present within influencing distance of the surface to remove any risks associated with mine collapse and associated ground subsidence.

6.3 Mine Shaft Treatment

No mine shafts are identified to be present in the vicinity of either development option. However, should previously unrecorded shafts be identified during groundworks additional ground investigation will be required to determine the condition of the mine shaft and to allow a detailed design for the treatment of the shaft to be finalised.

If shafts are found to have been treated and the capped and the backfill is found to be in a good condition, it may not be necessary to undertake further works, other than testing to determine whether the mine shaft cap is suitable for any increased actions, should buildings be proposed to be constructed above the shaft.

If it is found that shafts have not been backfilled, or that the backfill has settled since treatment, then the

shafts should be filled to the proposed formation level of the development with a granular (Class 1) fill material. Should large quantities of poor quality backfill be encountered within the shafts, it may be necessary to treat the material to reduce the potential for future settlement, possibly by the injection of grout to fill voids.

Any existing poor quality caps, lining or seal and any loose backfill should be completely removed prior to any works to form new caps. The new caps should comprise a reinforced concrete slab capable of spanning the shafts and supporting the imposed load. The caps should extend beyond the shaft liner and have a width of at least twice the shaft diameter. The foundations for the proposed structures should consider the location and treatment of the shafts and avoid applying load to the shafts and shaft caps.

6.4 Piled Foundations

Piled foundations may be required if deep Made Ground is found in the west of the Site where tipped materials may be present or if heavily loaded structures are proposed. There may be a risk of settlement should the toe depth of piles be at a depth where the zone of loading and the zone of stress influence are close to broken or poor quality ground. Therefore, it may be necessary to systematically grout any voids present within influencing distance of the piles and piles may need to be extended to below the base of the broken ground/workings.

7. Conclusions and Recommendations

7.1 Conclusions

- It is considered likely that the Middleton Main coal seam is present at relatively shallow depths beneath the Site. Coal Authority mine abandonment plans indicate that this seam has been worked beneath the Site. If worked beneath the proposed structure, this seam is potentially located within influencing distance of the surface and could theoretically cause settlement at the surface if the risks are not mitigated;
- The BGS maps and historical maps indicate that material has been historically tipped in the west of the Site, resulting in an area of raised ground. Given the historic nature of the tipping, it is considered that any significant settlement of backfilled materials is likely to have occurred by now, however, construction activities could potentially cause further settlement, including inundation settlement. This will need to be considered in the design of temporary and permanent works, including the design of access roads and permanent road surfacing;
- The Mining Report does not identify any mine entries on, or within 20m of, the Site. However, the potential for unrecorded shafts or bell pits to be present on site should not be ruled out, particularly given the mining activity identified at the Site. Therefore, a watching brief should be undertaken throughout the duration of the groundworks to ensure that no historical mining features are identified, and if they are encountered, that they are appropriately remediated;
- Should piled foundations or piled retaining walls etc. be proposed as part of the development there may be a risk of settlement should the toe depth of piles be at a depth where the zone of loading and the zone of stress influence are close to broken or poor quality ground, such as worked coal seams; and,
- It is, however, concluded that the Site can be made safe and stable, to meet the requirements of the National Planning Policy Framework with regard to remediating and mitigating unstable land. The risks are reasonably well understood and it is concluded that the development can proceed safely provided the following recommendations are implemented.

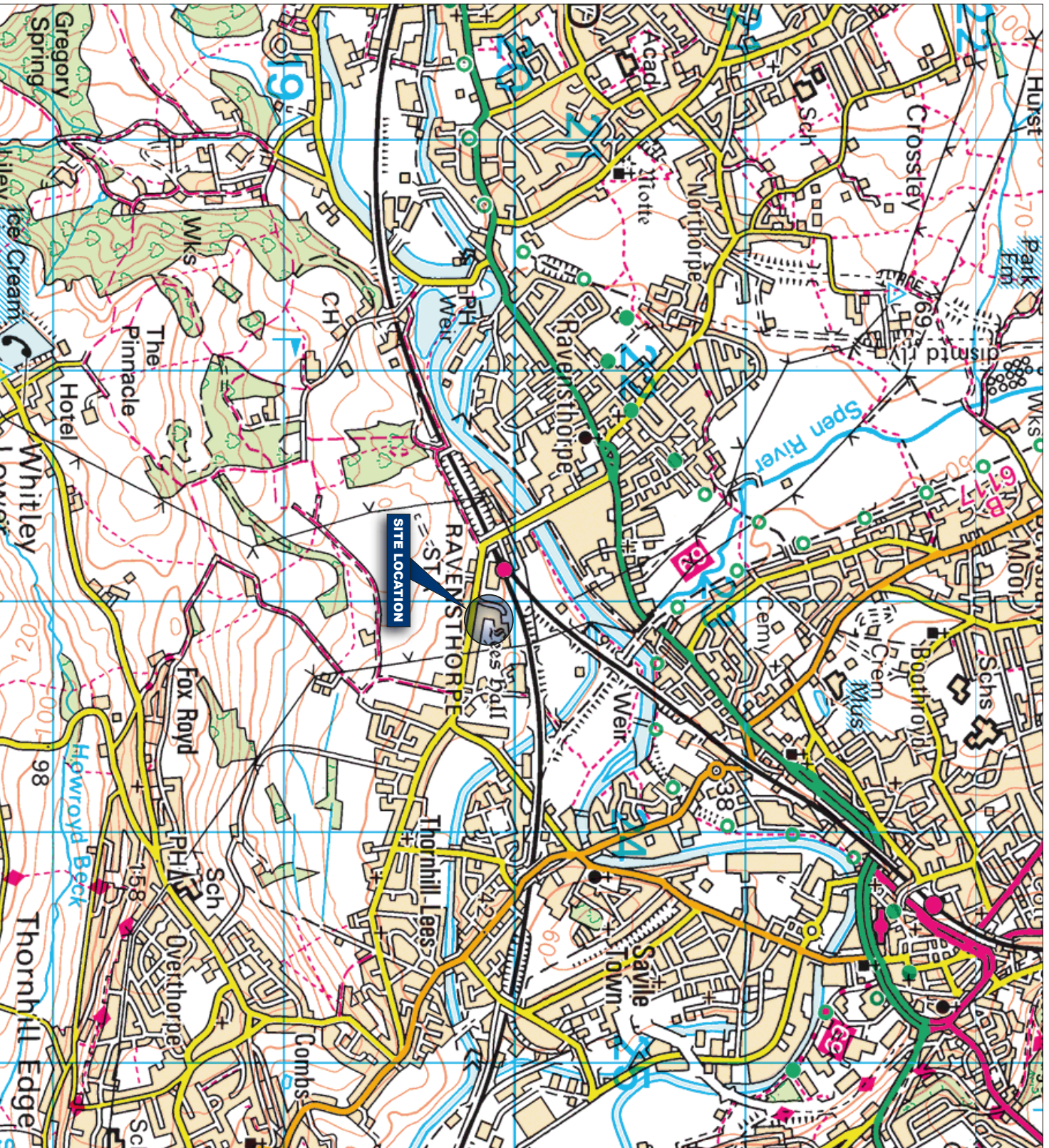
7.2 Recommendations

- Before development proceeds, an intrusive mining investigation should be undertaken to confirm whether the shallow seams contain workings;
- The investigation will require a Coal Authority Permit for Intersecting, Disturbing or Entering Coal and this should be applied for a minimum of 2 weeks before commencing the investigation;
- The investigation should include sufficient rotary boreholes to adequately determine the depths and integrity of the coal seams identified in this report. Where seams are present within influencing distance of the surface, sufficient investigation should be provided to attempt demonstrate the absence of workings to a reasonable level of confidence;
- Should mine workings be identified at shallow depths the preferred mitigation strategy will be to systematically grout any voids present within influencing distance of the surface to remove any risks associated with mine collapse and associated ground subsidence;
- The potential for unrecorded mine entries should not be ruled out and this should be monitored on site during site strip/earthworks activities; and,
- Where possible, the proposed development layout may be amended to ensure that construction above the mine shaft is not required.



APPENDICES

A. Site Plans



Project Details

WIE 13350-100: Longley Concrete

Figure Title

Figure A1: Site Location Plan

Figure Ref

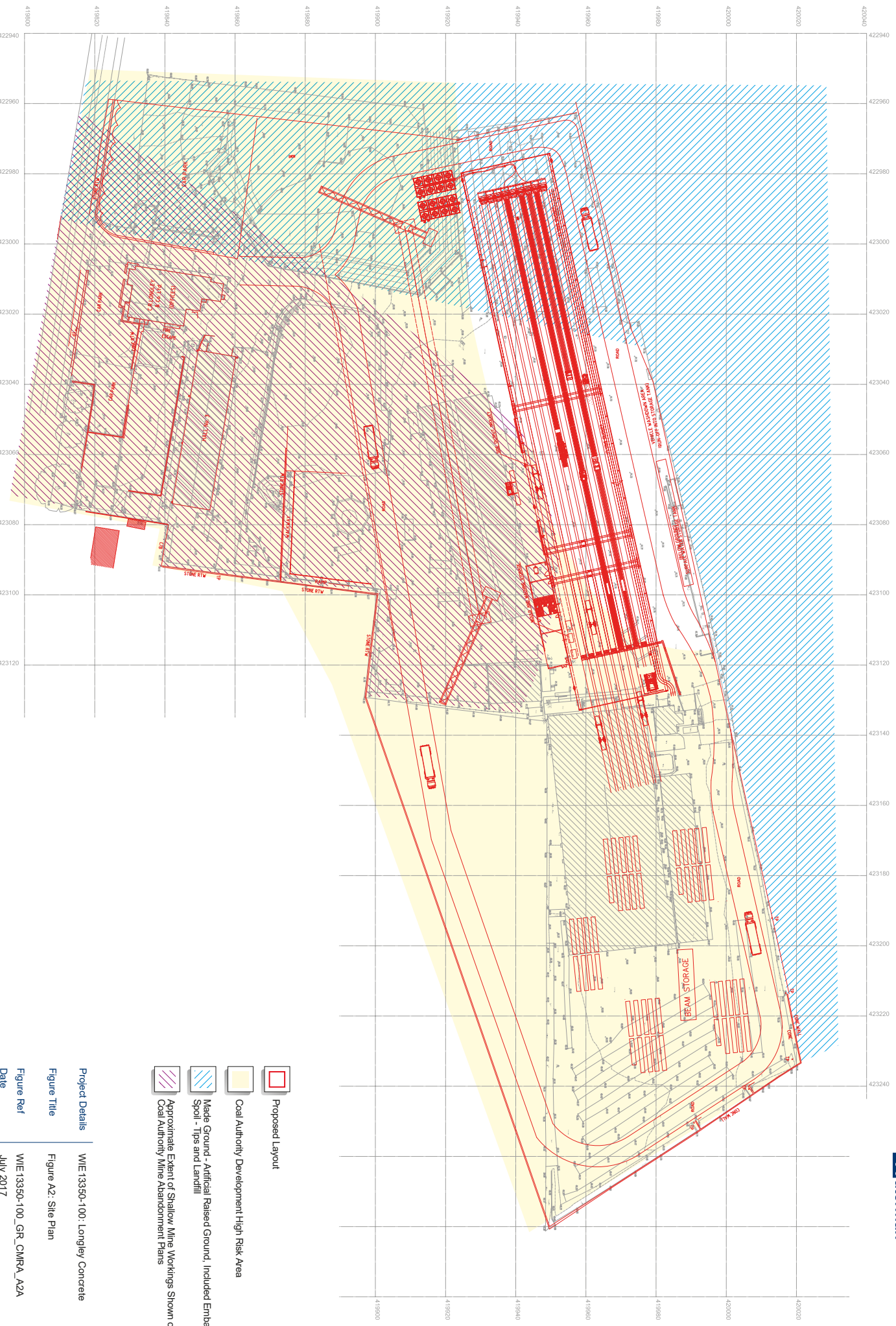
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Date

July 2017

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-  Proposed Layout
-  Coal Authority Development High Risk Area
-  Made Ground - Artificial Raised Ground, Included Embankments, Spoil - Tips and Landfill
-  Approximate Extent of Shallow Mine Workings Shown on Coal Authority Mine Abandonment Plans

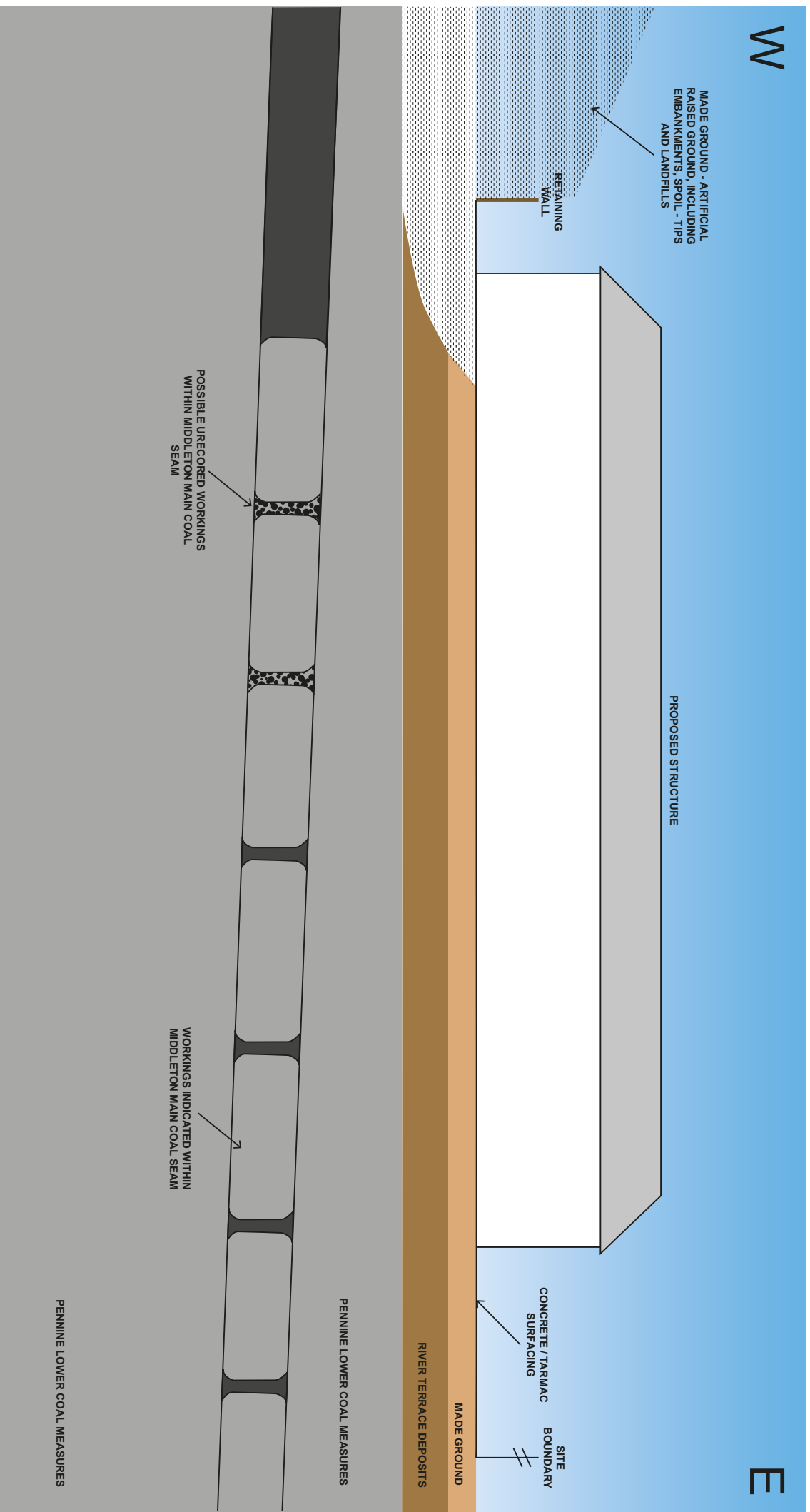
Project Details
WIE 13350-100: Longley Concrete

Figure Title
Figure A2: Site Plan

Figure Ref
WIE 13350-100_GR_CMRA_A2A

Date
July 2017

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Project Details

W/E 13350-100: Longley Concrete

Figure Title

Figure A3: Mining Features Cross-section

Figure Ref

W/E 13350-100_GR_CMRA_A3A

Date

July 2017

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B. Mining Report & Coal Authority Mine Abandonment Plan

Appendices

Coal Mining Risk Assessment
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WIE13350-100-R-1.1.2-Mining

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CONSULTING SURVEYORS

Regulated Coal Mining Search Report

Incorporating Cheshire Brine Enquiries



Serial Number 367179

Client detail :

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Cleveland
TS18 3NA

CoalSearchPlus+ by David Bellis Consulting
Surveyors Ltd
8 Mornington Terrace
Harrogate
North Yorkshire
HG1 5DH
(DX 720352 Harrogate)

Tel 01423 529911
Fax 01423 529922

Search produced by M J Peace

Property details:

Longley Concrete
Ravensthorpe Road
Dewsbury
WF12 9EF

Your ref : S170511 SOL 1187

Purchaser :

Vendor :

In accordance with your instructions received 11 May 2017 we have inspected plans and records of coal mine workings and have made enquiries with respect to Cheshire brine extraction in relation to the above property and can report as follows :

1. SEAM DETAILS FOR PAST UNDERGROUND COAL MINING : In relation to the property the undermentioned seam(s) have been worked within the likely zone of physical influence on the surface.

Seam	Depth (m)	Sect (cm)	Date	Remarks
Middleton Main	23	91	Pre 1900	Subjacent
Beeston	100	58	Pre 1909	Adjacent
Black Bed	185	56	Pre 1917	Subjacent

2. SEAM DETAILS FOR CURRENT AND FUTURE UNDERGROUND COAL MINING : The undermentioned seam(s) are currently being worked, or licenses to work are being determined, or have been granted to work, within the likely zone of physical influence on the surface in relation to the property.

Seam	Depth (m)	Sect (cm)	Date	Remarks
				Coal in reserve - no workings currently planned.

3. UNDERLYING GEOLOGY :

The property is situated in an area of River Terrace Deposits over Lower Coal Measures, shales and mudstones.

Outcrop of the Silkstone/Middleton Main coal seam.

Serial Number 367179

4. OPENCAST COAL MINING :

Past Opencast Workings : The property is not situated within the boundary of a former opencast coal mining site.

Present Opencast Workings : The property is not situated within 200m of the boundary of a currently operating opencast coal mining site.

Future Opencast Workings : The property is not situated within 800m of the boundary of an opencast site for which a license to extract coal by opencast methods has been granted or a license to do so is currently being determined.

5. SHAFTS, ADITS (MINE ENTRIES) AND ADDITIONAL INFORMATION :

We have no knowledge of any shafts or adits within 20 metres of the property or the boundary of the property.

There are no tips or lagoons in the vicinity of the property.

There are possible ancient coal mining workings within the likely zone of influence on the surface in the vicinity of the property, for which no accurate plans or records exist.

6. NOTICES IN RELATION TO FUTURE COAL MINING ACTIVITY :

We have no knowledge of any intention to work coal by underground methods within influencing distance on the surface in the vicinity of the property for which section 46 notices have been issued under the Coal Mining Subsidence Act 1991.

7. PAST COAL MINING RELATED SUBSIDENCE :

A review of the records held by the Coal Authority has shown no evidence of coal mining related subsidence claims in relation to the subject property since 31st October 1994. This is the period for which records are held by the Coal Authority.

8. CONCLUSION (COAL MINING) : In the light of the above facts we conclude that in relation to coal mining :

Old workings are present but all settlement is likely to have completed long ago.

Very old shallow workings are present and further settlement is possible however the possibility is remote.

In our opinion it is unlikely that coal will be worked in the foreseeable future.

C. AL MINING RISK LEVEL : We recommend that the transaction is treated as :

Where this report is to be used for development purposes particular attention is drawn to the paragraphs below concerning the ownership of in situ coal, coal workings and the risks from mine gases.

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Please note that the overall coal mining risk level above is based upon an assessment of the detailed information contained in the body of the report. The risk assessment must be used in conjunction with the detailed report.

If development of the property is being considered then all necessary enquiries and investigations should be completed prior to the commencement of works to ensure that proposals follow good engineering practice for development in mining areas. The Coal Authority has ownership of in situ coal, coal mines (both current and disused) and coal mine shafts and adits. Activities that intersect, enter or disturb any of the Coal Authority's interests require the written permission of the Authority.

Any development proposals should consider risks to the development, or adjacent property, of generating or displacing underground gases where coal seams or former mining works are disturbed. The need for effective measures to prevent gasses entering public properties should be assessed and properly addressed. These actions are necessary due to the public safety implications of development in these circumstances.

CHESHIRE BRINE EXTRACTION INFORMATION :

The property lies outside the Cheshire Brine Compensation District as prescribed by the Cheshire Brine Pumping (Compensation for Subsidence) Act 1952.

With respect to coal mining there is nothing to prevent a claim being made under the provisions of the Coal Mining Subsidence Act 1991 and subsequent legislation, but it must not be inferred that the Coal Authority or their licensees will necessarily accept that any damage has been caused as a result of mining subsidence.

If you require any further information please contact CoalSearchPlus+ on 01423 529911 or via our website www.coalsearch.plus.com.

This report is prepared in accordance with the CoalSearchPlus+ terms and conditions as published on the CoalSearchPlus+ website (www.coalsearch.plus.com) on the date of issue of this report.

This is a Coal Mining Search Report and is not to be interpreted as being part of an Environmental Assessment of the property.

We cannot be held responsible for the accuracy of the information provided to us by third party organisations.

The information and/or material supplied is composed from data based in many cases on measurements and records of various standards of reliability and age. We cannot be held responsible for the accuracy of such information.

This search report is based upon the privately owned CoalSearchPlus+ mining record database, data supplied to CoalSearchPlus+ under license from the Coal Authority, and plans and records held by the Coal Authority and made publicly available at the time of inspection which may include British Geological Survey and Ordnance Survey data. Organisations reserve the right to vary their proposals and intentions as to their future mining operations without prior notice save as provided in the Coal Mining (Subsidence) Act 1991 and the Coal Industry Act 1994.

This report contains Data provided by the Coal Authority. Any and all analysis and interpretation of the Coal Authority Data in this report is made by David Bellis Consulting Surveyors Ltd trading as CoalSearchPlus+, and is in no way supported, endorsed or authorised by the Coal Authority. The use of the data is restricted to the terms and provisions contained in this report. Data reproduced in this report may be copyright of the Coal Authority and permission should be sought from David Bellis Consulting Surveyors Ltd prior to any re-use.

Coal Authority Address : The Coal Authority, 200 Lichfield Lane, Berry Hill, Mansfield, Nottinghamshire, HG18 4RG
British Geological Survey Address : British Geological Survey, Kingsley Dunham Centre, Keyworth, Nottingham NG12 5GG

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The information contained in this report relates to the property address given by the individual or organisation ordering the report. Where a plan indicating the property location and boundary is supplied with the instruction the report is based on that information.

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Where no plan is supplied the report is based on the property location as defined in publicly available mapping data. At all times it remains the responsibility of the instructing organisation or individual to define the boundary of the property.

Additional notes applicable to Residential Coal Mining Reports only:

David Bellis Consulting Surveyors Ltd is not aware of any personal or business relationship between the person conducting or preparing the search and any person involved in the sale of the property.

This report is a desk study of existing published geological and coal mining records, the CoalSearchPlus+ coal mining data base and data supplied under license by the Coal Authority. In order to compile this report enquiries have been made in relation to the following:

Past Coal Mining – the existence of any previously worked seams of coal within influencing distance on the surface in relation to the property including an indication of the depth and age of the workings,

Present Coal Mining - the existence of any currently worked seams of coal within influencing distance on the surface in relation to the property including an indication of the depth and age of the workings. The existence of coal that could be worked at some time in the future will be enquired into and detail of any relevant licenses disclosed where available.

Underlying Geology - the underlying geology of the property will be reviewed and briefly described in relation to coal mining.

Opencast Coal Mining - the existence of past present and future opencast coal mining, specifically :

- if the property is situated within the boundary of a former opencast site. In the case of old opencast workings it must be understood that the records are often unclear regarding the site boundary and or worked areas. Published records and data supplied under license by the Coal Authority will be reviewed to give our opinion of the existence of relevant former opencast coal workings.
- if the property is situated within 200m of the boundary of a currently operating opencast site.
- if the property is situated within 800m of the boundary of an opencast for which either a license to extract coal by opencast methods has been granted or a license to do so is currently being determined.

Shafts, Adits (Mine Entries) and Additional Information – the existence of any mine entries within 20m of the property or the boundary of the property and its associated land and buildings (the definition of the boundary of the property is the responsibility of the individual or organisation ordering this report). Where a mine entry is found to exist the approximate location of the mine entry will be indicated on a plan. The existence of unworked coal will be enquired into and our opinion regarding the likelihood of it being worked at some time in the past will be given where relevant. Any other relevant coal mining related features discovered will be noted.

Notices in relation to future coal mining activity – the existence of notices indicating an intention to work coal by underground methods in the future.

Past coal mining related subsidence – if any publicly available records indicate coal mining related subsidence affecting the property since 31st October 1994.

Coal Mining Risk Level – the opinion of David Bellis Consulting Surveyors Ltd of the risk posed to the property from coal mining given all the information contained in the report. The risk to the property is given in relation to the majority of the housing stock in the immediate area.

Cheshire Brine – the location of the property in relation to the Cheshire Brine Compensation District and any available relevant information to the property regarding brine extraction.

Additional information, including answers to many frequently asked questions, can be found on the CoalSearchPlus+ website, www.coalsearch.plus.com

Complaints Procedure

David Bellis Consulting Surveyors Ltd is registered with the Property Codes Compliance Board as a subscriber to the Search Code. A key commitment under the Code is that firms will handle any complaints both speedily and fairly.

If you want to make a complaint, we will:

- Acknowledge it within 5 working days of receipt.
- Normally deal with it fully and provide a final response, in writing, within 20 working days of receipt.
- Keep you informed by letter, telephone or e-mail, as you prefer, if we need more time.
- Provide a final response, in writing, at the latest within 40 working days of receipt.
- Liaise, at your request, with anyone acting formally on your behalf.

If you are not satisfied with our final response, or if we exceed the response timescales, you may refer the complaint to The Property Ombudsman scheme (TPOs):

Tel: 01722 333306, E-mail: admin@tpos.co.uk

We will co-operate fully with the Ombudsman during an investigation and comply with his final decision.

Complaints should be sent to:

Mr M. Peace, Director, David Bellis Consulting Surveyors Ltd, 8 Mornington Terrace, Harrogate, North Yorkshire, HG1 5DH
Tel : 01423 529911 Fax : 01423 529922 Email : contact@coalsearch.plus.com

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Date : 16 May 2017

Signed :

A handwritten signature in blue ink, appearing to read 'M. Stone'.

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Serial Number 367179**Important Consumer Protection Information**

This search has been produced by David Belius Consulting Surveyors Ltd, 8 Mornington Terrace, Harrogate, HG1 5DH (T: 01423 529911, F: 01423 529922, E: contact@coalsearch.plus.com) which is registered with the Property Codes Compliance Board (PCCB) as a subscriber to the Search Code. The PCCB independently monitors how registered firms maintain compliance with the Code.

The Search Code:

- provides protection for homebuyers, sellers, estate agents, conveyancers and mortgage lenders who rely on the information included in property search reports undertaken by subscribers on residential and commercial property within the United Kingdom
- sets out minimum standards which firms compiling and selling search reports have to meet
- promotes the best practice and quality standards within the industry for the benefit of consumers and property professionals
- enables consumers and property professionals to have confidence in firms which subscribe to the code, their products and services.

By giving you this information, the search firm is confirming that they keep to the principles of the Code. This provides important protection for you.

The Code's core principles

Firms which subscribe to the Search Code will:

- Display the Code logo prominently on their search reports.
- Act with integrity and carry out work with due skill, care and diligence.
- At all times maintain adequate and appropriate insurance to protect consumers.
- Conduct business in an honest, fair and professional manner.
- Handle complaints speedily and fairly.
- Ensure that all search services comply with the law, registration rules and standards.
- Monitor their compliance with the Code.

Complaints

If you have a query or complaint about your search, you should raise it directly with the search firm, and if appropriate ask for any complaint to be considered under their formal internal complaints procedure. If you remain dissatisfied with the firm's final response, after your complaint has been formally considered, or if the firm has exceeded the response timescales, you may refer your complaint for consideration under The Property Ombudsman scheme (TPOs). The Ombudsman can award up to £5,000 to you if the Ombudsman finds that you have suffered actual financial loss and/or aggravation, distress or inconvenience as a result of your search provider failing to keep to the Code.

Please note that all queries or complaints regarding your search should be directed to your search provider in the first instance, not to TPOs or to the PCCB.

TPOs Contact Details:

The Property Ombudsman scheme
Milford House
43-55 Milford Street
Salisbury
Wiltshire SP1 2BP
Tel: 01722 333306
Fax: 01722 332296
Website: www.tpos.co.uk
Email: admin@tpos.co.uk

You can get more information about the PCCB from www.propertycodes.org.uk.

PLEASE ASK YOUR SEARCH PROVIDER IF YOU WOULD LIKE A COPY OF THE SEARCH CODE

Serial Number 367179**David Bellis Consulting Surveyors Ltd and CoalSearchPlus+ Terms and Conditions (Available in large print by request)**

1. Definitions.
 - a) The Service Provider is David Bellis Consulting Surveyors Ltd, trading as CoalSearchPlus+.
 - b) The Applicant is the Individual, Organisation, or appointed officer of said Organisation placing a Request with the Service Provider.
 - c) The Third Party Provider is any Organisation from which the Service Provider obtains data and/or information on behalf of the Applicant in the normal course of fulfilling the Applicants Request.
 - d) The request is a formal Request by the Applicant with CoalSearchPlus+ to retrieve specific data and/or information.
2. CoalSearchPlus+ accept Requests only on the basis that the Applicant is acting as a principal and is directly liable for payment of our invoice or account.
3. It is the policy of CoalSearchPlus+ to observe confidentiality with regard to the identity and affairs of our customers to the extent permitted by law, but, in common with other service providers, we may be required exceptionally to disclose information to governmental and other public authorities.
4. The placing of a Request by the Applicant with CoalSearchPlus+ confirms acceptance of these terms and conditions.
5. Any Order Form produced by CoalSearchPlus+, either printed or published on the CoalSearchPlus+ website, is an invitation to treat. The Applicant makes an offer to buy from CoalSearchPlus+ by the submission of a Request, subject to clause 10. Acceptable modes of transmission for a Request are facsimile (fax), telephone, electronic mail(e-mail), online transmission via the CoalSearchPlus+ website only, Document Exchange (DX), Royal Mail or courier appointed by the Applicant.
6. Orders will be accepted on order forms other than CoalSearchPlus+ forms however these will be accepted under the standard CoalSearchPlus+ terms and conditions only, subject to Clause 10.
7. CoalSearchPlus+ reserves the right to refuse any Request.
8. CoalSearchPlus+ reserves the right to cancel any Request at any time.
9. Proof of transmission of a Request by the Applicant does not constitute proof of receipt by CoalSearchPlus+.
10. It is the responsibility of the Applicant to ensure the accuracy, legibility, clarity and completeness of all data and/or information provided to CoalSearchPlus+ as part of the Request, including but not limited to, names, numbers, addresses, location plans, and boundary plans. This applies whether the Request is submitted on CoalSearchPlus+ order forms either printed or published on the CoalSearchPlus+ website or on the Applicants own order form.
11. CoalSearchPlus+ may request additional relevant data and/or information from the Applicant in the course of fulfilling a Request, including, but not limited to, names, numbers, addresses, location plans, and boundary plans.
12. CoalSearchPlus+ may request clarification of data and/or information supplied by the Applicant.
13. If, subsequent to Clause 11. and/or Clause 12., requested data and/or information is not provided and/or clarified, CoalSearchPlus+ cannot be held responsible for any resultant loss or delay.
14. If, subsequent to Clause 11. and/or Clause 12., requested data and/or information is not provided and/or clarified within a reasonable period of time, CoalSearchPlus+ reserves the right to cancel the Request in whole or in part. The Applicant remains liable for all fees, Taxes and Disbursements accrued prior to the cancellation.
15. CoalSearchPlus+ reserves the right to subcontract data and/or information retrieval to selected Organisations and/or Individuals. CoalSearchPlus+ is not required to reveal the identity of its Subcontractors.
16. CoalSearchPlus+ will, in the process of fulfilling the request, retrieve data and/or information from publicly and/or commercially available sources and the CoalSearchPlus+ mining database. The sources of data used will primarily be data held by The Coal Authority under an agreement with the Health and Safety Executive, data owned by the British Geological Survey and the CoalSearchPlus+ database.
17. A CoalSearchPlus+ mining report is a report of the interpretation of the data sources in 16. made by CoalSearchPlus+ staff.
18. CoalSearchPlus+ coal mining search reports are based upon the plans and records available from data sources detailed in 16. at the time the report was produced. It should be understood that third party organisations reserve the right to vary their proposals and intentions as to their future mining operations without prior notice save as provided in the Coal Mining Subsidence Act 1994. CoalSearchPlus+ cannot be held responsible for changes to the future proposals and intentions of Third Parties.
19. The information and/or material supplied in a CoalSearchPlus+ coal mining report is composed from data based, in many cases, on measurements and records of various standards of reliability and age. In some instances (usually relating to older records) it is necessary for CoalSearchPlus+ to make assumptions regarding the 'best plot' position of mining features. For these reasons users of CoalSearchPlus+ reports should take the position of mining features detailed in reports to be indicative only.
20. The data and/or information that a coal mining search report is based on is constantly being updated. A CoalSearchPlus+ coal mining search report is based on the most up to date information available at the time that the report is produced however it cannot be guaranteed that the information and/or data will not become obsolete at some time in the future. Responsibility for the supply of accurate and up to date information to CoalSearchPlus+ lies with the data supplying organisations listed in 16.
21. A CoalSearchPlus+ coal mining search report relates only to coal mining and minerals worked in relation to coal mining. Other reports may be required in relation to other minerals.
22. A CoalSearchPlus+ coal mining search report is not a substitute for site investigation or a mining survey. Depending on the content of a coal mining search report, or whether development is intended, the Applicant must decide whether a site investigation or mining survey is required.
23. CoalSearchPlus+ coal mining reports comply with the Search Code.

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24. All CoalSearchPlus+ reports are covered by professional indemnity insurance. The content of CoalSearchPlus+ coal mining search reports does not prevent any future claim being made by the Applicant against the Coal Authority in respect of coal mining related subsidence.
25. Any liability in the instance of negligence by CoalSearchPlus+ or its employees in the interpretation of coal mining data and/or the production and provision of coal mining reports will be limited to the extent of the CoalSearchPlus+ Professional Indemnity Insurance or the value of the loss caused by the negligence, whichever is the lower.
26. All CoalSearchPlus+ coal mining search reports give the information detailed in the services section of the CoalSearchPlus+ website and summarised in the report. Further explanation of this information is available in the Glossary and/or the Frequently Asked Questions areas of the CoalSearchPlus+ website. Alternatively contact CoalSearchPlus+ who will be happy to explain the content of a report.
27. The Request is fulfilled when all reports, data and/or information requested by the Applicant have been retrieved and/or compiled by CoalSearchPlus+ and delivered by electronic mail (e-mail) or fax or post or document exchange (DX) or a combination of these methods as required by the Applicant. Alternative delivery arrangements are at the discretion of CoalSearchPlus+.
28. If Requests for multiple reports, data and/or information relating to multiple addresses were made on a single order form these will be fulfilled individually by the delivery of the reports, data and/or information relating to each individual address being treated as an individual Request.
29. CoalSearchPlus+ is not responsible for any loss or misdelivery of retrieved data and/or information caused by failure of Document Exchange (DX), Royal Mail or internet service provider. Most retrieved data and/or information is archived by CoalSearchPlus+ and a copy may be requested by the Applicant. If the data and/or information could not be archived CoalSearchPlus+ reserves the right to treat the request as a new Request.
30. Delivery, by whatever agreed means, will be accompanied by an invoice. Delivery by electronic mail may be followed up with a paper invoice by post or DX. Where Applicants have agreed account facilities with CoalSearchPlus+ invoicing may be on a monthly basis. In all cases the Applicant agrees to provide CoalSearchPlus+ with remuneration for the full amount shown on the invoice, including all Fees, Taxes and Disbursements.
31. The Applicant will be liable for payment of the full invoice amount within 14 days from the date of receipt of the invoice. CoalSearchPlus+ reserve the right to charge for costs and expenses incurred in recovering late payments and to charge interest at the rate of 8% above the Bank of England base rate per annum for the full period that the payments are overdue.
32. Where full payment of the invoice is not made by the Applicant within 14 days from receipt of the invoice CoalSearchPlus+ reserve the right to withdraw account facilities from the Applicant and cancel any individual agreements concerning fees or other Terms and Conditions that may have been made between the Applicant and CoalSearchPlus+.
33. Where possible the Applicant will receive Advance Notice of the cost of the Request, including all Fees, Taxes and Disbursements, prior to receipt of the invoice. This advance notice will take the form of the price for the service requested as published on the CoalSearchPlus+ website, or the price as individually agreed between CoalSearchPlus+ and the Applicant.
34. Additional Fees, Taxes and Disbursements may arise during the course of data and/or information retrieval, over and above Advance Notice costs as in clause 33. The Applicant is liable for any such additional costs. Where possible, the Applicant is notified of additional costs prior to fulfilment of the Request.
35. If the Applicant shall pay in advance of receipt of the invoice, then the Applicant remains liable for any underpayment.
36. Any overpayment on the part of the Applicant will be refunded. Arrangements for refunds are agreed on a case-by-case basis, through discussion between CoalSearchPlus+ and the Applicant.
37. The Applicant may cancel the Request in whole or in part at any time prior to Clause 27.
38. If the Applicant cancels the Request in whole or in part prior to Clause 27, the Applicant remains liable for all Fees, Taxes and Disbursements already accrued prior to the Cancellation.
39. CoalSearchPlus+ accept no liability for any loss incurred by the Applicant or the Applicants client where the Applicant is acting as an agent for a client, due to late fulfilment and delivery of the Request.
40. CoalSearchPlus+ accept no liability for any loss to the Applicant, or the Applicant's client where the Applicant is acting as an agent for a client, due to any negative outcome of a report provided in the process of the correct and accurate fulfilment of the Request.
41. Any disputes relating to the provision of coal mining search reports should be addressed to the Practice Principal, CoalSearchPlus+ in the first instance. Disputes will be settled according to the CoalSearchPlus+ complaints procedure detailed in each report.
42. Independent Dispute Resolution - If you make a complaint and we are unable to resolve it to your satisfaction you may refer the complaint to The Property Ombudsman scheme (website: www.tpos.co.uk email: admin@tpos.co.uk Tel: 01722 333306). We will cooperate fully with the Ombudsman during an investigation and comply with his final decision.
43. Third Party and subcontractor Terms and Conditions shall apply in addition to these clauses. Should any conflict arise between CoalSearchPlus+ Terms and Conditions and Third Party or Subcontractor Terms and Conditions, then CoalSearchPlus+ Terms and Conditions prevail unless and until CoalSearchPlus+ expressly states otherwise in writing and/or courts of England and Wales establish otherwise.
44. No variation to these Terms and Conditions is effective unless and until CoalSearchPlus+ expressly agrees in writing.
45. CoalSearchPlus+ reserves the right to alter these terms and conditions as appropriate, without notice, at any time. Such amended Terms and Conditions will become effective upon publication on the CoalSearchPlus+ website.
46. These Terms and conditions are subject to English Law and the exclusive jurisdiction of the courts of England and Wales.

A P L A N

Thornhill Saw Works, property of John Malby.
 Marked by Nelson Malby's and Company's
 Survey by William Richardson Jan 1852

1852	1851	1850	1849	1848	1847	1846	1845	1844	1843	1842	1841	1840	1839	1838	1837	1836	1835	1834	1833	1832	1831	1830	1829	1828	1827	1826	1825	1824	1823	1822	1821	1820	1819	1818	1817	1816	1815	1814	1813	1812	1811	1810	1809	1808	1807	1806	1805	1804	1803	1802	1801	1800	1799	1798	1797	1796	1795	1794	1793	1792	1791	1790	1789	1788	1787	1786	1785	1784	1783	1782	1781	1780	1779	1778	1777	1776	1775	1774	1773	1772	1771	1770	1769	1768	1767	1766	1765	1764	1763	1762	1761	1760	1759	1758	1757	1756	1755	1754	1753	1752	1751	1750	1749	1748	1747	1746	1745	1744	1743	1742	1741	1740	1739	1738	1737	1736	1735	1734	1733	1732	1731	1730	1729	1728	1727	1726	1725	1724	1723	1722	1721	1720	1719	1718	1717	1716	1715	1714	1713	1712	1711	1710	1709	1708	1707	1706	1705	1704	1703	1702	1701	1700	1699	1698	1697	1696	1695	1694	1693	1692	1691	1690	1689	1688	1687	1686	1685	1684	1683	1682	1681	1680	1679	1678	1677	1676	1675	1674	1673	1672	1671	1670	1669	1668	1667	1666	1665	1664	1663	1662	1661	1660	1659	1658	1657	1656	1655	1654	1653	1652	1651	1650	1649	1648	1647	1646	1645	1644	1643	1642	1641	1640	1639	1638	1637	1636	1635	1634	1633	1632	1631	1630	1629	1628	1627	1626	1625	1624	1623	1622	1621	1620	1619	1618	1617	1616	1615	1614	1613	1612	1611	1610	1609	1608	1607	1606	1605	1604	1603	1602	1601	1600	1599	1598	1597	1596	1595	1594	1593	1592	1591	1590	1589	1588	1587	1586	1585	1584	1583	1582	1581	1580	1579	1578	1577	1576	1575	1574	1573	1572	1571	1570	1569	1568	1567	1566	1565	1564	1563	1562	1561	1560	1559	1558	1557	1556	1555	1554	1553	1552	1551	1550	1549	1548	1547	1546	1545	1544	1543	1542	1541	1540	1539	1538	1537	1536	1535	1534	1533	1532	1531	1530	1529	1528	1527	1526	1525	1524	1523	1522	1521	1520	1519	1518	1517	1516	1515	1514	1513	1512	1511	1510	1509	1508	1507	1506	1505	1504	1503	1502	1501	1500	1499	1498	1497	1496	1495	1494	1493	1492	1491	1490	1489	1488	1487	1486	1485	1484	1483	1482	1481	1480	1479	1478	1477	1476	1475	1474	1473	1472	1471	1470	1469	1468	1467	1466	1465	1464	1463	1462	1461	1460	1459	1458	1457	1456	1455	1454	1453	1452	1451	1450	1449	1448	1447	1446	1445	1444	1443	1442	1441	1440	1439	1438	1437	1436	1435	1434	1433	1432	1431	1430	1429	1428	1427	1426	1425	1424	1423	1422	1421	1420	1419	1418	1417	1416	1415	1414	1413	1412	1411	1410	1409	1408	1407	1406	1405	1404	1403	1402	1401	1400	1399	1398	1397	1396	1395	1394	1393	1392	1391	1390	1389	1388	1387	1386	1385	1384	1383	1382	1381	1380	1379	1378	1377	1376	1375	1374	1373	1372	1371	1370	1369	1368	1367	1366	1365	1364	1363	1362	1361	1360	1359	1358	1357	1356	1355	1354	1353	1352	1351	1350	1349	1348	1347	1346	1345	1344	1343	1342	1341	1340	1339	1338	1337	1336	1335	1334	1333	1332	1331	1330	1329	1328	1327	1326	1325	1324	1323	1322	1321	1320	1319	1318	1317	1316	1315	1314	1313	1312	1311	1310	1309	1308	1307	1306	1305	1304	1303	1302	1301	1300	1299	1298	1297	1296	1295	1294	1293	1292	1291	1290	1289	1288	1287	1286	1285	1284	1283	1282	1281	1280	1279	1278	1277	1276	1275	1274	1273	1272	1271	1270	1269	1268	1267	1266	1265	1264	1263	1262	1261	1260	1259	1258	1257	1256	1255	1254	1253	1252	1251	1250	1249	1248	1247	1246	1245	1244	1243	1242	1241	1240	1239	1238	1237	1236	1235	1234	1233	1232	1231	1230	1229	1228	1227	1226	1225	1224	1223	1222	1221	1220	1219	1218	1217	1216	1215	1214	1213	1212	1211	1210	1209	1208	1207	1206	1205	1204	1203	1202	1201	1200	1199	1198	1197	1196	1195	1194	1193	1192	1191	1190	1189	1188	1187	1186	1185	1184	1183	1182	1181	1180	1179	1178	1177	1176	1175	1174	1173	1172	1171	1170	1169	1168	1167	1166	1165	1164	1163	1162	1161	1160	1159	1158	1157	1156	1155	1154	1153	1152	1151	1150	1149	1148	1147	1146	1145	1144	1143	1142	1141	1140	1139	1138	1137	1136	1135	1134	1133	1132	1131	1130	1129	1128	1127	1126	1125	1124	1123	1122	1121	1120	1119	1118	1117	1116	1115	1114	1113	1112	1111	1110	1109	1108	1107	1106	1105	1104	1103	1102	1101	1100	1099	1098	1097	1096	1095	1094	1093	1092	1091	1090	1089	1088	1087	1086	1085	1084	1083	1082	1081	1080	1079	1078	1077	1076	1075	1074	1073	1072	1071	1070	1069	1068	1067	1066	1065	1064	1063	1062	1061	1060	1059	1058	1057	1056	1055	1054	1053	1052	1051	1050	1049	1048	1047	1046	1045	1044	1043	1042	1041	1040	1039	1038	1037	1036	1035	1034	1033	1032	1031	1030	1029	1028	1027	1026	1025	1024	1023	1022	1021	1020	1019	1018	1017	1016	1015	1014	1013	1012	1011	1010	1009	1008	1007	1006	1005	1004	1003	1002	1001	1000	999	998	997	996	995	994	993	992	991	990	989	988	987	986	985	984	983	982	981	980	979	978	977	976	975	974	973	972	971	970	969	968	967	966	965	964	963	962	961	960	959	958	957	956	955	954	953	952	951	950	949	948	947	946	945	944	943	942	941	940	939	938	937	936	935	934	933	932	931	930	929	928	927	926	925	924	923	922	921	920	919	918	917	916	915	914	913	912	911	910	909	908	907	906	905	904	903	902	901	900	899	898	897	896	895	894	893	892	891	890	889	888	887	886	885	884	883	882	881	880	879	878	877	876	875	874	873	872	871	870	869	868	867	866	865	864	863	862	861	860	859	858	857	856	855	854	853	852	851	850	849	848	847	846	845	844	843	842	841	840	839	838	837	836	835	834	833	832	831	830	829	828	827	826	825	824	823	822	821	820	819	818	817	816	815	814	813	812	811	810	809	808	807	806	805	804	803	802	801	800	799	798	797	796	795	794	793	792	791	790	789	788	787	786	785	784	783	782	781	780	779	778	777	776	775	774	773	772	771	770	769	768	767	766	765	764	763	762	761	760	759	758	757	756	755	754	753	752	751	750	749	748	747	746	745	744	743	742	741	740	739	738	737	736	735	734	733	732	731	730	729	728	727	726	725	724	723	722	721	720	719	718	717	716	715	714	713	712	711	710	709	708	707	706	705	704	703	702	701	700	699	698	697	696	695	694	693	692	691	690	689	688	687	686	685	684	683	682	681	680	679	678	677	676	675	674	673	672	671	670	669	668	667	666	665	664	663	662	661	660	659	658	657	656	655	654	653	652	651	650	649	648	647	646	645	644	643	642	641	640	639	638	637	636	635	634	633	632	631	630	629	628	627	626	625	624	623	622	621	620	619	618	617	616	615	614	613	612	611	610	609	608	607	606	605	604	603	602	601	600	599	598	597	596	595	594	593	592	591	590	589	588	587	586	585	584	583	582	581	580	579	578	577	576	575	574	573	572	571	570	569	568	567	566	565	564	563	562	561	560	559	558	557	556	555	554	553	552	551	550	549	548	547	546	545	544	543	542	541	540	539	538	537	536	535	534	533	532	531	530	529	528	527	526	525	524	523	522	521	520	519	518	517	516	515	514	513	512	511	510	509	508	507	506	505	504	503	502	501	500	499	498	497	496	495	494	493	492	491	490	489	488	487	486	485	484	483	482	481	480	479	478	477	476	475	474	473	472	471	470	469	468	467	466	465	464	463	462	461	460	459	458	457	456	455	454	453	452	451	450	449	448	447	446	445	444	443	442	441	440	439	438	437	436
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C. BGS exploratory hole logs

Appendices

Coal Mining Risk Assessment
Document Reference: WIE13350
WIE13350-100-R-1.1.2-Mining



BOREHOLE LOG

SE 22 SW/28.
2317 2006

B.H. NO. 1

DATE	DEPTH OF BORING m	DEPTH OF CASING m	DEPTH TO WATER m	STRATA DESCRIPTION	STRATA CHANGE		S.P.T. BLOWS	DEPTH m	SAMPLE TYPE
					DEPTH	O.D.			
					m	m			
12.79				TOPSOIL	0.10	39.61			
	1.10		strikes	SILTY CLAY Soft to firm. Brown, occasional sandy pockets and small roots	1.10	39.51		1.00	○
				SANDY GRAVEL Brown. Sandy F.M.C. rounded and sub-angular gravel. Silty at some horizons.			24	1.35 to 1.65	X○
	3.30		3.30	Sandy gravel piping up → borehole casing	3.30		13	2.75 to 3.05	X○
2.79	4.60	4.0*	3.30					3.60	○
2.79			2.30					4.65 to 4.95	X○
				VERY GRAVELLY M.C. SAND Grey and brown. Some rounded and sub-angular F.M. gravel	6.10	33.51		5.65 to 6.10	□
		7.00	6.10	Sand piping → up casing to 6.1m	7.00	32.61		6.10 to 6.30	
				SAND/GRAVEL/COBBLES. Grey M.C. sand and M.C. rounded and sub-angular gravel or cobbles (chisel used to make progress)	8.50 approx	31.11		7.55 to 8.00	X○
79	9.00	9.00	6.10		9.00		55	8.65 to 8.95	X○
79			1.30	SHALY MUDSTONE. Grey, finely laminated with silty partings. (Probably weathered Coal Measures)	9.40	30.21		9.45 to -	□
79	9.30		1.00		9.30	29.71		9.30	□

END OF BOREHOLE
* Casing driven to 5.5m, drilling tools jammed; casing withdrawn to 4.0m

Bulk sample Bag sample	Borehole diameter 150mm Ground water observations Water was encountered at 0.1 metres
N.R. Water sample	

SE 21 NW 21

HOLST & CO. LTD.

SITE INVESTIGATION DEPT.
6-7, NEW YORK ROAD,
LEEDS, 2.

2355 1978

B

Contract No. 16307/B274

Borehole No. 2.

Location Thornhill Dewsbury.

Ground Level 136.80

Client James Austin & Sons Ltd.

Date 3.7.64.

BOREHOLE LOG

STRATA	Legend	Depth below Ground Level	Thickness of Strata	Type of Sample	c lb/sq. ft.	φ deg.	m.c. %	γ lb/cu. ft.	N"
Made Ground - Ashes cinders.	▨			1.07 3'6"					9
			15.57	2.59 8'6"					4.58 16
		15.57	4.13 12'6"	I				4.27 14	
Made Ground - Bricks, clay and ashes.	▨		2.13 7'0"	5.64 18'6"					5.16 17
		6.71 22'0"		I					
Grey silty clay with traces of peat.	▨	7.32 24'0"	2'0" 0.61						
Coarse sand.	▨	8.53 28'0"	4'0" 1.22	8.23 27'0"					4.18 16
Coarse sand with slight gravel.	▨	9.45 31'0"	0.90 3'0"						
Large gravel and coarse sand.	▨	10.52 35'6"	1.37 4'6"	10.21 33'6"					11.28 37
Brown silty clay.	▨	11.13 36'6"	1'0" 0.30	11.43 37'6"					
Grey shale.	▨	12.19 40'0"	3'6" 1.07	I					15.90 62

Water struck at 24'0" 7.32 Maximum Observed Water Level 14'0" 4.27

Undisturbed Sample □ Disturbed Sample ○ Water Sample Δ Penetration Test I	c = Cohesion φ = Angle of Internal Friction m.c. = Moisture Content γ = Dry Density N = Standard Penetration Value
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Water levels may be subject to seasonal or tidal variation and should not be taken as constant.

SE21NW/21

HOLST & CO. LTD.

SITE INVESTIGATION DEPT.

5-7, NEW YORK ROAD,
LEEDS, 2.

6

Contract No. 16307/B294

Borehole No. 7.

Location Thornhill Dewsbury.

Ground Level 133.85' 40.02

Client James Austin & Sons Ltd.

Date 7.7.64

BOREHOLE LOG

STRATA	Legend	Depth below Ground Level	Thickness of Strata	Type of Sample	c lb/sq. ft.	φ deg.	m.c. %	y lb/cu. ft.	N	
Made Ground - Bricks & Ashes.	[Cross-hatch pattern]	0.61 2'0"	0.61 2'0"	1.07 3'6"						
Made Ground - Ashes.				I					6	
				2.59 7'6"	I					7
			4.27 12'0"		I					6
Coarse Sand with slight gravel.	[Small dots pattern]	5.79 19'0"	0.91 3'0"							
Large Gravel and Coarse Sand.				7.16 23'6"					20	
			5.18 17'0"	8.69 28'6"					20	
			10.21 33'6"						20	
		10.97 36'0"		11.28 37'0"						
Grey Shale.	[Horizontal lines pattern]	11.73 38'6"		I					74	

Water struck at 18'0" 5'49 Maximum Observed Water Level 18'0" 5'49

Undisturbed Sample □ Disturbed Sample ○ Water Sample Δ Penetration Test I	c = Cohesion φ = Angle of Internal Friction m.c = Moisture Content y = Dry Density N = Standard Penetration Value
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Water levels may be subject to seasonal or tidal variation and should not be taken as constant.

SE 21 NW 121

HOLST & CO. LTD.

SITE INVESTIGATION DEPT.

5-7, NEW YORK ROAD, 2363 1996

LEEDS, 2.

H

Contract No. 16307/B294

Borehole No. B

Location Thornhill Dewsbury

Ground Level 131.85' 40.19

Client James Austin & Sons Ltd.

Date 8. 7. 64

BOREHOLE LOG

STRATA	Legend	Depth below Ground Level	Thickness of Strata	Type of Sample	c lb/sq. ft.	φ deg.	m.c. %	γ lb/cu. ft.	N
Made Ground Ashes.	[Cross-hatch pattern]	1.52 5'0"	1.52 5'0"	(1.07 3'6") I					12
Made Ground Clay.	[Cross-hatch pattern]	3.96 13'0"	2.44 8'0"	(2.59 8'6") I					11
Made Ground Ashes & Clay	[Cross-hatch pattern]	5.49 18'0"	1.52 5'0"	(4.11 13'6") I					10
Medium Gravel and Coarse Sand.	[Small dots pattern]	6.71 22'0"	1.22 4'0"	(5.69 18'6") I					23
Large Groveland Coarse Sand.	[Large dots pattern]	10.06 33'0"	3.35 11'0"	(7.16 23'6") I					23
Grey Shale.	[Horizontal lines pattern]	10.97 36'0"		(8.69 28'6") I					18
				(10.52 34'6") I					84

Water struck at 16'0" 4.88 Maximum Observed Water Level 16'0" 4.88

- | | |
|--|--|
| <ul style="list-style-type: none"> Undisturbed Sample □ Disturbed Sample ○ Water Sample Δ Penetration Test I | <ul style="list-style-type: none"> c = Cohesion φ = Angle of Internal Friction m.c. = Moisture Content γ = Dry Density N = Standard Penetration Value |
|--|--|

Water levels may be subject to seasonal or tidal variation and should not be taken as constant.

SE 21NW/23

SECTIONS OF STRATA OF THE

C.3.—CALDER COLLIERY (No. 1 PIT).—Continued.

	YD.	FT.	IN.	YD.	FT.	IN.		YD.	FT.	IN.	YD.	FT.	IN.
46 Grey seat	0	2	10					93 Sandstone very hard and broken (Bramble Flage)	12	2	2		
47 Grey and blue bind	3	0	10					94 Blue shale with hard bands	19	2	0		
48 Black shale	0	1	0					95 Grey sandstone	2	0	6		
49 COAL	0	0	5					96 Soft dark shale	9	1	0		
50 Grey seat	1	2	8	89	2	6		97 Hard grey sandstone	5	0	6		
51 COAL	0	0	4					98 Soft dark shale	5	2	0		
52 Soft seat	1	0	1					99 Dark blue shale	46	0	10		
53 Upper Shirtcliffe Coal	0	1	10	91	2	6		100 Dark sandy shale	16	0	8		
54 Grey seat	1	0	6					101 Black shale	9	2	3		
55 Black shale	0	2	0					102 Dark blue sandy shale	17	0	10		
56 Grey seat	2	2	10					103 Black shale	4	2	6		
57 Grey bind	9	1	8					104 Strong grey shale with COAL streaks (80 yards Band)	2	0	9		
58 Strong stone bind	3	0	0					105 Black shale	1	0	0		
59 Strong grey bind	7	2	0					106 Dark sandy shale	29	2	0		
60 Lower Shirtcliffe Coal	0	1	3					107 COAL (48 yards Band)	0	0	0		
61 Seat stone	1	0	0	118	2	8		108 Seat earth	0	0	10		
62 Strong grey bind mixed with stone	5	0	9					109 Dark sandy shale	1	0	7		
63 White stone	1	0	9					110 Dark shale with strong bands, trace of COAL (36 yards Band)	9	2	3		
64 Blue bind	6	0	6					111 Fireclay	1	0	10		
65 Black shale	0	0	9					112 Hard rock	2	2	11		
66 Seat earth	1	0	0					113 Grey and dark shale	2	0	7		
67 Blue bind	5	2	9					114 Hard grey sandstone	1	1	4		
68 Dark stone bind	12	2	0					115 Grey shale with hard bands	14	0			
69 White stone	15	2	4					116 Hard grey rock	0	2	0		
70 Blue bind	1	0	0					117 Black shale	0	1	0		
71 COAL	0	0	2					118 White sandstone	0	2	8		
72 Seat earth	0	2	8					119 White shale	1	1	8		
73 Strong grey bind	7	0	0					120 Dark puggy shale	2	0	0		
74 White stone and galliard	2	0	10					121 Strong grey sandy shale with rock bands	3	1	2		
75 COAL	0	0	3					122 Hard grey sandstone	16	1	6		
76 Seat earth	1	0	0					123 Grey shale	3	0	6		
77 Grey bind	2	1	3					124 Hard dark rock	0	1	0		
78 White stone	0	2	1					125 Dark puggy shale	1	1	0		
79 Black shale (Crow Coal)	0	0	11					126 Hard grey sandstone (paraffin seen at 844 feet down in bore-hole)	2	0	0		
80 Seat earth	0	1	0					127 Grey sandy shale	5	2	2		
81 Grey bind, blue at top	15	1	1					128 Dark puggy shale	8	1	10		
82 Clod	0	0	6					129 COAL	0	0	1		
83 Low Moor Black Bed	0	2	7					130 Seat earth	1	1	0		
84 Seat earth	0	2	6					131 Grey sandy shale	4	0	11		
85 Strong bind	1	2	0					132 Hard white sandstone (Millstone Grit)	7	2	0		
86 White stone	1	1	6										
87 Blue bind	3	2	5										
88 Strata	1	0	1										
BOTTOM OF SHAFT, BORING COMMENCES.													
89 Galliard	0	2	0										
90 Sandy shale	33	1	8										
91 Low Moor Better Bed	0	1	2										
92 Fireclay	1	0	6										

NOTE.—Owing to a 30 yard fault crossing the borehole between 260 yards and 268 yards down, neither the Halifax Hard Bed, nor the Halifax Soft Bed were passed through. They should have been at about 272 and 299 yards respectively below the Black Bed Coal, and the top of the Millstone Grit should be 342 yards below the Black Bed, or 542 yards from the surface.—JOHN NEVIN.

- 1 Raised pit
- 2 Soil and c
- 3 Rock
- 4 Brown an
- 5 Blue bind
- 6 Dark mar
- 7 Strong bi
- 8 Stone bin
- 9 Bind with
- 10 Dog tooth "mocks"
- 11 Ironstone bind
- 12 Strong st
- 13 Dark bin
- 14 Ironstone on roof
- 15 Black bin stone b
- 16 Black bin
- 17 Black bin stone b
- 18 Bind and
- 19 COAL
- 20 Stone clu
- 21 Bands of stone b
- 22 Black clo
- 23 Chavery C
- COAL
- Clunch
- Clod
- COAL
- Clod
- COAL
- Clod
- COAL
- Clunch
- Black l.
- 24 Clunch
- 25 Bands of stone b
- 26 Bind wit band
- 27 Deep Soft
- 28 Stone clu
- 29 Stone bin
- 30 COAL sm
- 31 Clunch
- 32 Stone bin
- 33 Strong bi

GREENMOOR ROCK
Fillard Flage
Oakenash Rock
Probably 30 yds. above
SOFT BED FLAGE
POT CLAY COB

C.3.—INGHAM'S COLLIERY, THORNHILL
(208 YARDS N.W. OF THE BYE PIT).

Table with columns for strata names, vertical feet (VD), and horizontal feet (HD). Includes sections for 'Date of Sinking, 1894' and 'Height above O.D., 280 ft.'.

SE 21 NW 222
2398 1896

C.3.—INGHAM'S COLLIERY, THORNHILL
(208 YARDS N.W. OF THE BYE PIT)—Continued.

Continuation of the geological table from page 240, listing strata names and measurements.

(This Colliery is sunk to the Black Bed; the Better Bed was proved in a fault.)

C.3.—RAVENSLDGE COLLIERY, DEWSBURY

Table for Ravenslodge Colliery, Dewsbury, showing strata names and measurements. Includes 'Date of Sinking, 1889'.

SE 22 SW 960

BR
OH
3M
LE
MY

SECTIONS OF STRATA OF THE
C.3.—RAVENSLDGE COLLIERY,
DEWSBURY.—Continued.

Continuation of the geological table for Ravenslodge Colliery, Dewsbury, listing strata names and measurements.

D. Landmark Historical Maps

- 1938 – 1:10,560 map showing Ingham's Pit Colliery to the south east of the Site and Calder New Pit to the west of the Site
- 1894 – 1:10,560 map showing Raven's Lodge Colliery to the north of the Site
- 1955-1956 – 1:1,250 map showing the extent of tipping across the western area of the Site

Appendices