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Phase 2 Geo-environmental Report

ON

PROPOSED BUSINESS PARK

AT

LINDLEY MOOR ROAD, HUDDERSFIELD

FOR

2SH Developments Ltd

APRIL 2022

E21/7768/R002

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0.0 **EXECUTIVE SUMMARY**

SITE	The site consists of three grassed fields located to the south of Lindley Moor Road. The western and eastern boundaries are formed by Crosland Road and Weather Hill Road respectively. To the south there is an ongoing residential development. The fields are delineated by intermittent mature hedges and trees. There are two metal pylons located on the site. The first is located in the north west of the site and has overhead cables heading to the north and the south east. The second is located in the east of the site and has overhead cables heading to the west and east At the time of the site investigation works, due to the adverse weather conditions, the ground conditions were noted to be very soft which proved difficult for the heavier plant to navigate. The site generally falls from the north west to the south east.
HISTORY	There has been no significant development of the site since 1854. From 1854-1955 a Roman Road was indicated in the north west of the site and from 1854-1892 two wells were indicated in the north east of the site. There has been residential development to the south east of the site from 1948, and to the south west from 2021.
GEOLOGY	The central and south eastern area of the site is shown to be underlain by the Pennine Lower Coal Measures consisting of Mudstone, Siltstone and Sandstone. The north eastern, north western and south eastern corners of the site are underlain by the Elland Flags, 80 Yard Rock and 48 Yard respectively, all consisting of Sandstone. The trial pits generally proved topsoils overlying clays with a mudstone or sandstone bedrock encountered at 1.2-2.2m below existing ground levels. The boreholes undertaken proved alternating bands of mudstone, siltstone and sandstone to a depth of 30m. Four of the rotary boreholes recorded a 0.1-0.8m thick unworked coal seam at the base of the black shale at depths of 9.4-27.7m below existing ground levels.
MINING/QUARRYING	The previous archaeological investigation identified a possible quarry adjacent the southern boundary of the site. This was not confirmed during the site investigation. In TP07 in the south east of the site, a 0.1m thick coal seam was recorded in the clay strata at 0.8-0.9m below existing ground levels. In TP09 adjacent the eastern boundary, a 0.2m thick weathered coal seam and a 0.3m thick very

weak coal seam were encountered at 0.4-0.6 and 2.1-2.4m below existing ground levels. This is likely to be a single seam that split as it outcropped. In only WS13 in the east of the site a 1.0m thick seam of coal was encountered at 1.0-2.0m below existing ground levels. This is potentially an exaggerated seam thickness from an upturn in the coal seam as it outcrops. Four of the rotary boreholes recorded a 0.1-0.8m thick unworked coal seam at depths of 9.4-27.7m below existing ground levels. The coal was shallowest adjacent the recorded outcrops crossing the site. None of the seams encountered showed evidence of being worked. However, due to the shallow nature of the coal adjacent the recorded outcrops, it is considered possible that the coal may have been worked and extracted from the surface through the use of bellpits. It is therefore recommended that a site scrape is undertaken during development to allow a visual inspection of the underlying natural strata to determine the presence of any features

HYDROLOGY

The nearest open surface water feature to the site is an un-named watercourse located 166m east of the site. During the investigation works, a shallow sandstone culvert was encountered that exits the site through the eastern boundary and appears to discharge towards this open watercourse.

HYDROGEOLOGY

The bedrock underlying the site is classified as a Secondary (A) aquifer. Groundwater seepage was noted in TP02, TP03, TP06, TP07, TP08 and TP09 at depths of 1.4-2.6m below existing ground levels. TP06 was left open for several hours and the groundwater level rose to within 1.3m of the surface level. Water strikes were recorded in eight of the fourteen boreholes at depths of 1.6-9.0m below ground level. During the gas monitoring, water levels have been recorded between the surface and 2.70m below ground level.

HAZARDOUS GAS

The development is not in an area requiring radon protection measures. A maximum carbon dioxide concentration of 4.8% was recorded in R15. No methane has been detected in any of the monitoring stations during the monitoring. Based on the maximum concentrations and gas flow rates measured to date, the gas regime found on this site can be classified as CS1 by BS 8485:2015

CONTAMINATION

No elevated levels of contaminants were identified in the samples taken from site when compared to the tier 1 trigger levels for commercial land use.

REMEDIATION	Topsoil to be stripped and stockpiled behind protective fencing to prevent cross contamination during development. Watching brief to be undertaken during site strip for evidence of mining features, historical wells in north east of site and anecdotal quarry adjacent southern boundary. Exact location of fault line to be determined by further trial trenching following site strip prior to construction. Possible trace survey of existing land drainage to be undertaken to determine if any diversion works are required to accommodate the proposed development. Any features encountered to be surveyed and reported to all any necessary remediation strategies to be agreed.
FOUNDATIONS	that the commercial units should be constructed on strip/trench fill and pad footings founded entirely onto the mudstone/sandstone strata with ground bearing floor slabs. Due to the steep nature of the site, it is likely that re-levelling works will be required to accommodate the proposed commercial units and parking areas. Consideration may need to be given to piled foundations dependent on the depth to suitable founding material from final proposed finished floor levels. Where shallow coal is encountered within the foundation excavations, the foundations should be extended beneath the coal strata to underlying mudstone/sandstone. The exposed coal face should be sealed off to prevent combustion.
DRAINAGE	Infiltration methods have proved unsuitable for use on site. A discharge rate has been previously agreed with the Local Water Authority and the LLFA through the planning application.

1.0 INTRODUCTION

- 1.1 As requested by Martin Walsh Architectural Ltd, on behalf of 2SH Developments Ltd, this practice carried out ground and contamination investigation works to the proposed business park to the south of Lindley Moor Road, Huddersfield.
- 1.2 The purpose of the report was to:-
 - 1.2.1 Identify the nature of the near surface strata, in order to enable recommendations to be made as to the most economic foundation solution for the proposed commercial development.
 - 1.2.2 To identify any areas of contaminated ground.
 - 1.2.3 Determine if ground gas migration from probable shallow mineworkings in the vicinity would adversely affect the site.
 - 1.2.4 Determine if shallow mineworkings or mineshafts would adversely affect the site.
 - 1.2.5 Determine if infiltration methods would be a suitable long term form of surface water disposal.
- 1.3 Soil sampling was undertaken via trial pits to determine the near surface strata. Distributed samples were taken for testing to ascertain the nature of the soils and fills present.
- 1.4 The conclusions and recommendations made in this report are limited to the findings of the preliminary Geotechnical Survey. The report is made on condition that Haigh Huddleston Associates will not in any circumstances be liable for loss, arising directly or indirectly from ground conditions encountered between trial pits, window samples and boreholes, which have not been revealed by the investigation.
- 1.5 Any opinion given on the possible configuration of strata between trial pit, window samples and borehole locations and below maximum depth of the investigation is for guidance only. Any remarks on groundwater conditions made are based solely on observations made at the time of investigation. Kindly note that levels may differ from those reported due to seasonal variations or other influences.
- 1.6 Furthermore, there is the possibility that any trial pits, window samples or boreholes undertaken as part of the investigatory works may be within the influence of existing or proposed foundations or excavations. Haigh Huddleston Associates cannot be held responsible for any failure of any excavations, foundations or structures within the influence of the trial pits, window samples or boreholes.

2.0 THE SITE

- 2.1 The site is located to the south of Lindley Moor Road, Huddersfield, Huddersfield and is situated around Ordnance Survey grid reference 410924, 419016. A site location plan is included in Appendix A.
- 2.2 The western, northern and eastern boundaries to the site are formed by Crosland Road, Lindley Moor Road and Weather Hill Road respectively. To the south there is ongoing residential development. Beyond Crosland Road to the west is an industrial park, beyond the highways to the north and east there are fields and existing residential developments. The site area is approximately 6.33ha.
- 2.3 The site consists of three grassed fields separated by intermittent mature hedges. The first hedge runs from the northern to the southern boundary, separating the western third of the site into a single field. A second hedge extends to the eastern boundary from the centre of the first hedge, separating the east of the site into north eastern and south eastern fields.
- 2.4 There are two metal pylons located on the site. The first is located in the north west of the site and has overhead cables heading to the north and the south east. The second is located in the east of the site and has overhead cables heading to the west and east.
- 2.5 The boundary to the site is formed by a one metre high, occasionally dilapidated, drystone wall. There are three access points on the eastern boundary from Weather Hill Road and one on the western boundary from Crosland Road.
- 2.6 The site falls from west to east from a high point of 265.5m AOD on the western boundary to a low point of 236.3m AOD in the south eastern corner at an average grade of 1 in 13. The site is noted to bank down at a steeper grade of 1 in 6 in the south eastern corner of the site.
- 2.7 At the time of the site investigation works, due to the adverse weather conditions, the ground conditions were noted to be very soft which proved difficult for the heavier plant to navigate. In particular, the soft ground was noted to follow the hedge line

from the centre of the site to the eastern boundary and in the lower south eastern corner of the site.

- 2.8 The areas of softer ground are potentially associated with a shallow culverted watercourse/land drain which exits the site via the eastern boundary and discharges to the watercourse indicated approximately 170m east of the site. A plan indicating the areas of softer ground is included in Appendix A.

3.0 SITE HISTORY

A number of historical Ordnance Survey plans from 1854-2020 have been consulted. These are contained for reference within Appendix C to the rear of the report. Below is a brief description outlining the significant developments that may affect future construction of the site.

Date	Historical uses on site	Historical findings within 100m perimeter of the site	Historical findings further than 100m perimeter of the site
1854	i) The site is shown divided into three fields. ii) Two wells are shown adjacent the eastern boundary. iii) Supposed Roman Road indicated in north west of site.	i) There are highways to the northern, western and eastern boundaries. ii) Haigh Cross approximately 30m to the south west.	i) Well approximately 100m south of site.
1892-1918	i) Wells no longer shown adjacent eastern boundary.	i) Two springs shown 50m south of site and one 100m north of site.	i) Well no longer shown.
1948	i) The on-site features are similar to the previous sheet.	i) Residential development immediately south east of site.	i) No significant developments within 500m of the site.
1955-1966	i) Roman Road no longer indicated in north west of site.	i) No significant developments within 100m of the site.	i) No significant developments within 500m of the site.
1975-2010	i) Pylons shown in the north west and east of the site.	i) Further residential development immediately south east of site.	i) M62 heading west to east approximately 150m to the north west.
2021	i) The on-site features are similar to the previous sheet.	i) Industrial development to west of site. ii) Residential development to south west of site.	i) No significant developments within 500m of the site.

4.0 **SITE GEOLOGY & MINING**

- 4.1 The BGS Digital Geological Map of Great Britain at 1:10,000 and 1:50,000 scale have been consulted and we would report as follows:-
- 4.2 There are no areas of made ground or artificial deposits shown on site. There are areas of made ground shown heading west to east approximately 76m north west of the site associated with the M62 construction.
- 4.3 No superficial strata is shown overlying the site.
- 4.4 The central and south eastern area of the site is shown to be underlain by the Pennine Lower Coal Measures consisting of Mudstone, Siltstone and Sandstone. The north eastern and north western corners of the site is underlain by the Elland Flags and 80 Yard Rock respectively, both consisting of Sandstone. A thin band of the site in the south east is shown to be underlain by the 48 Yard Rock formation consisting of Sandstone.
- 4.5 A fault is shown crossing the site from west to east from the north western corner to the eastern boundary. A second fault line is shown encroaching on the south western corner of the site.
- 4.6 In addition to the above, the site is in an area where **underground mining of the Elland Flags Sandstone is known or considered likely to have occurred**. The Elland Flag Formation is recorded in the north western corner of the site.
- 4.7 Pea Wood Fireclay Mine, which extracted shale, is recorded as **having workings partly on the surface and partly underground on the site**.
- 4.8 A Coal Authority Report is included in Appendix B and states that the property is in a surface area that could be affected by underground coal mining in 1 seam of coal at 80-90m depth and last worked in 1857. Any movement in the ground due to coal mining activity associated with these workings should have stopped by now. However, the property is in an area where the Coal Authority believes **there is coal at, or close to, the surface**. Historically, this coal could have been worked by private individuals and the workings would be unrecorded.

- 4.9 The property is not in area where the Coal Authority has granted, or plans to grant, a licence to remove or otherwise work coal using underground methods. However, reserves of coal exist in the local area which could be worked in the future.
- 4.10 No mine entries are recorded within, or within 20m of, the site boundary. However, based on the Coal Authority's knowledge of the mining circumstances at the time of this enquiry, there may be unrecorded mine entries in the local area that do not appear on Coal Authority records.
- 4.11 The Coal Authority Online Interactive Map shows a coal outcrop crossing from the western boundary to the south east corner of the site. Probable shallow workings extend northwards from the outcrop covering the majority of the site.
- 4.12 There are no recorded BGS boreholes in the immediate vicinity of the site.
- 4.13 Archaeological investigation work has previously been undertaken on site by Onsite Archaeology Ltd and is detailed in their report ef: OSA20EV08 (Revised) dated July 2020. The trial trenching generally found a shallow depth of topsoils overlying yellowish orangey brown clays and sandstone fragments. Land drains formed from sandstone were encountered on site in addition to a former quarry on the southern boundary of the site.

5.0 ENVIRONMENTAL CONSIDERATIONS

5.1 Radon

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

No Radon Protective Measures are necessary.

5.2 Landfill Sites

There are no historical or active/recent landfills recorded within 250m of the site. However, there is unrecorded backfill to the former quarry located on the southern boundary of the site.

5.3 Flood Risk

The site is not an area at risk of flooding from rivers or the sea. The site is not located in an Environment Agency designated Flood Zone.

5.4 Groundwater

The bedrock underlying the site is classed as a Secondary A Aquifer. These are Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers.

There are four licensed discharge to controlled waters recorded within 250m of the site. Two are located 184m north west of the site and are both treated effluent discharges to groundwater. The remaining two are located 196m south of the site and are site drainage outfalls by surface water drain to Grimescar Dike.

There are no groundwater or surface water abstraction licences recorded within 250m of the site.

There is a single pollution incident to controlled waters within 250m of the site. This is located 165m south of the site and was a Category 1 (Major) incident involving suspended solids. This is not associated with the site.

The site is not located in a source protection zone.

The nearest recorded open surface water feature is an un-named watercourse located 166m east of the site. This is classed as an inland river not influenced by normal tidal action.

5.5 Designated Environmentally Sensitive Site

The land immediately north of Lindley Moor Road is classified as part of the South and West Yorkshire Green Belt.

6.0 PRELIMINARY CONCEPTUAL SITE MODEL

- 6.1 The initial stage in assessing the risks posed from contaminated land during the redevelopment of a site is to prepare a conceptual model. A generalised conceptual model can be developed highlighting the main pollutant linkages through a contaminant ► pathway ► receptor model for an industrial development. In order to prepare the conceptual model for a particular site the following parameters need to be reviewed as discussed below.
- 6.2 Contamination of existing land can be caused by a number of factors, including:-
- i) Possible historical/current industrial activities.
 - ii) Disposal of waste materials.
 - iii) Storage of materials.
 - iv) A number of natural processes can also lead to hazardous gases and elevated heavy metals.
- 6.3 Potential pathways can include ground and surface water, permeable strata, existing services providing a conduit and voided ground. Potential receptors can include human health, ecosystems, controlled waters and building structures. There are a number of ways that a receptor can be exposed to the contaminant these include, inhalation, direct contact, ingestion, dermal contact and uptake.
- 6.4 The site has not been developed since the earliest map of 1854, and there has been little development in the immediate vicinity of the site. However, there has been recorded underground extraction of coal, sandstone and shale beneath and in the vicinity of the site.
- i) Potential shallow sandstone, shale or coal workings beneath the site.
 - ii) Possible ground gas migration from potential shallow mine workings.
 - iii) Infill material to former quarry identified in south of site.
- There is therefore considered to be a low/moderate risk of ground contamination present.
- 6.5 Considering the proposed industrial end use, there will be two possible human receptor groups exposed to the existing onsite contamination:-
- a) Site operatives during development.
 - b) End users, future site visitors (the critical receptor is a 17 year old female).

- 6.6 Human receptors may be exposed to site contamination by a number of possible pathways. These pathways are summarised in Table 1 below.

Table 1- Potential Human Exposure Pathways

<u>Human Exposure Pathway</u>	<u>Site Visitors</u>	<u>Construction Workers</u>
Soil Ingestion	YES	YES
Consumption of Home Grown Vegetables	NO	NO
Dermal Contact	YES	YES
Dust Inhalation	YES	YES
Gases/Vapours	YES	NO

- 6.7 The construction workers will come into contact with any contaminated soil to a far greater extent than future residents. The exposure pathways are generally through dermal contact and indirect ingestion. However their exposure will be for a limited time and the provision and correct use of personnel protective equipment and adequate welfare facilities during construction should restrict their risks to acceptable levels.
- 6.8 The risk of pollution to controlled waters by existing contamination is considered low. There has been no historical development of the site likely to cause contamination and no surface water features are in the immediate vicinity of the site.
- 6.9 No specific areas of ecological importance have been identified in the initial desk top study. Therefore the site is considered to be in a low risk environmental setting. The potential for phototoxic materials to exist at shallow depth should be considered, these could pose a potential risk to new planting and soft landscaping areas within the proposed development.
- 6.10 The proposed planning drawings commercial/industrial units with associated parking areas. The presence of elevated sulphates and hydrocarbons could affect the long term integrity of buried concrete structures, including foundations and drainage pipes. Plastic water supply pipes can also be damaged by the presence of hydrocarbon contamination.

7.0 FIELDWORK

- 7.1 Site investigation works were undertaken on 8th-10th February using an 8 tonne tracked excavator with 600mm wide bucket. A total of twenty trial pits were excavated throughout the site, with two of these used for soakaway testing. In addition to this, sixteen window samples and sixteen rotary boreholes were undertaken on site, ten of these to a depth of 30m. Five further boreholes were undertaken to shallow depth to allow the installation of gas monitoring stations.
- 7.2 Materials encountered in the trial pits, window samples and boreholes were examined and categorised. Trial pit and borehole logs recording the materials on site are contained within Appendix B.
- 7.3 The soakaway test was undertaken in accordance with the method specified in BRE Digest 365 Soakaway Design. An instantaneous supply of water was provided via a bowser. In general, the trial pits were filled and the water levels were recorded against time as the water permeated into the natural strata. The water level was monitored over an extended time period to determine the infiltration rate for the natural strata.
- 7.4 The site investigation works were designed to achieve comprehensive site coverage within the proposed development area. In particular, trial trenches were undertaken to locate the fault line and anecdotal quarry. Borehole locations were restricted by the overhead power lines and in some instances, by the ability to track over the soft/waterlogged encountered due to the adverse weather conditions.
- 7.5 Soil samples were removed from the natural and made ground deposits within the trial pits. The samples were removed by operatives wearing gloves and placed into airtight clean plastic containers and glass bottles for transportation to the laboratory.
- 7.6 A total of thirteen samples from the natural and made ground deposits were recovered from the trial holes for chemical analysis. The testing was carried out by a UKAS accredited laboratory to nationally or accredited in-house methods. The results of the contamination testing are contained within Appendix C of this report.

- 7.7 A suite of common potential contaminants consisting of heavy metals, phytotoxic metals, sulphates, sulphides and poly-aromatic hydrocarbons was analysed for, including a range of metals and inorganic substances and Asbestos.

8.0 RESULTS OF THE INVESTIGATION

8.1 GEOTECHNICAL INVESTIGATION

- 8.1.1 A copy of the trial pit, window sample and borehole logs providing a complete record of strata encountered beneath the proposed development is presented in Appendix B.
- 8.1.2 The fieldwork generally proved a moderate depth of clays with a mudstone or sandstone bedrock.
- 8.1.3 The surface of all the trial pits proved rough grass over 0.2-0.4m of dark brown/grey topsoil.
- 8.1.4 Underlying the topsoil in all but TP13, there was layer of orange/grey clay with occasional sandstone gravels and cobbles. This varied in thickness from 0.2-1.9m across the site, and was identified as weathered sandstone in TP2. TP10 was undertaken in a depression noted on the eastern boundary and stopped at the base of the topsoil as a shallow stone culvert with water flow was encountered in the clay strata. The culvert was noted to flow eastwards where it left the site.
- 8.1.5 In TP07 in the south east of the site, a 0.1m thick coal seam was recorded in the clay strata at 0.8-0.9m below existing ground levels. In TP09 adjacent the eastern boundary, a 0.2m thick weathered coal seam and a 0.3m thick very weak coal seam were encountered at 0.4-0.6 and 2.1-2.4m below existing ground levels. This is likely to be a single seam that split as it outcropped.
- 8.1.6 Beneath the topsoil in TP13, and beneath the clay in TP11, TP12 and TP14 there was a 0.2-1.0m thick layer of weak mudstone excavated as shaley gravels. All four of these trial pits were in the north east of the site.
- 8.1.7 Beneath the clay in TP02, TP03, TP05, TP07 and TP13 there was a 0.5-1.1m thick layer of weathered light brown sandstone excavated as gravels and cobbles. This was encountered at 0.4-1.3m below existing ground levels. TP05, TP07 and TP13 terminated in this strata at depths of 1.2-1.8m below existing ground levels where the sandstone became hard to excavate.

- 8.1.8 Beneath the sandstone in TP02 and TP03, and beneath the clay in the remaining trial pits, there was a layer of moderately weak grey mudstone excavated as angular and shaley gravels which became difficult to excavate at depth. The mudstone was encountered at 0.8-1.8m below existing ground levels. All but TP01 terminated in this strata where a 0.2m thick layer of sandstone was encountered at 1.4-1.6m below existing ground levels.
- 8.1.9 No instability was noted within the trial pits. It should be noted, however, that apart from the soakaways and TP06, the trial pits only remained open for a short period of time before being infilled.
- 8.1.10 The results of the geotechnical analysis undertaken on the samples of clayey soil taken indicates the clay to be of medium to high plasticity (Plasticity Index 14-15%). If the modified results are calculated, taking into account the percentage of material retained on a 425micron sieve, the results correspond to a low shrinkage clay.

8.1.11 ANECDOTAL QUARRY

- 8.1.11.1 TT17-TT18B were undertaken on the southern boundary to determine the presence of the anecdotal quarry identified in the archaeological investigation.
- 8.1.11.2 TT17 was undertaken in a raised mound noted on the southern boundary and proved 0.2m of topsoil over loosely compacted grey shaley mudstone (made ground) to a depth of 1.1m below ground levels. Underlying this was natural soft to firm orange sandy clay.
- 8.1.11.3 TT18-TT18B all proved 0.2m of topsoil over a 0.5m thick layer of soft to firm orange sandy clay. Underlying this was a moderately weak grey mudstone excavated as shaley gravels.
- 8.1.11.4 There was no delineation in the underlying natural strata to indicate the presence of the anecdotal quarry. It should be noted that this area of the site is retained above the land to the south by a dry stone wall on the boundary.

8.1.12 FAULT LINE INVESTIGATION

8.1.12.1 Three trial trenches, TT15, TT19 and TT20 were undertaken to beneath the clay strata to determine the presence of the fault line indicated to cross the site.

8.1.12.2 TT20 was aborted due to the presence of a stone culvert encountered at shallow depth within the clay strata. This had an active flow that was seeping into the surrounding strata causing the land to become waterlogged and soft. It is presumed to connect to the culvert encountered in TP10 to the east.

8.1.12.3 TT19 proved 0.2m of topsoil overlying 0.5m of light brown angular sandstone gravels with weak grey mudstone extending to the base of the trial pit at 1.4m below existing ground levels. The trial trench was extended to the north and south and no difference was noted within the underlying strata.

8.1.12.4 Only TT15 in the north west of the site proved a difference in the underlying strata. 0.2m of topsoil overlaid 0.7M of angular sandstone gravels in a clay matrix. Underlying the sandstone was a layer of weak grey mudstone excavated as angular gravels. This terminated at a depth of 1.4m beneath existing ground levels in the north of the trial pit, but extended to a depth of 2.7m beneath existing ground levels in the south of the trial pit.

8.1.13 HISTORICAL WELLS

8.1.13.1 A limited site scrape was undertaken in the north east corner of the site to determine the presence of one of the historical wells. A 10x5m area of topsoil was scraped to expose the underlying clay and inspected.

8.1.13.2 There was no discolouration of the clay observed, or any remnants of a historical well encountered in this area of the site. However, due to the adverse site conditions, and the limited time remaining on site, it was not possible to undertake a comprehensive investigation for the wells.

8.1.14 WINDOW SAMPLES

8.1.14.1 The window samples undertaken on site generally proved 1.0-1.9m of soft to firm gravelly clay overlying a sandstone or mudstone bedrock where refusals were noted. In only WS13 in the east of the site a 1.0m thick seam of coal was encountered at 1.0-2.0m below existing ground levels. This is potentially an exaggerated seam thickness from an upturn in the coal seam as it outcrops.

8.1.14.2 Standard Penetration Test 'N' values taken at 1.0m depth increments within the window samples and boreholes and are summarised in Table 2 below:-

Table 2 Summary of SPT (N Values)

Depth (m)	0.50-0.60	1.00-1.45	1.50-1.95	1.90-2.35	2.00-2.45	2.50-2.95	4.00-4.45
WS01	-	34	-	-	REFUSAL	-	-
WS02	-	20	-	REFUSAL	-	-	-
WS03	-	15	-	REFUSAL	-	-	-
WS04	-	REFUSAL	-	-	-	-	-
WS05	-	REFUSAL	-	-	-	-	-
WS06	-	21	-	-	REFUSAL	-	-
WS07	-	19	REFUSAL	-	-	-	-
WS08	-	23	-	-	REFUSAL	-	-
WS09	-	22	REFUSAL	-	-	-	-
WS10	REFUSAL	-	-	-	-	-	-
WS10A	REFUSAL	-	-	-	-	-	-
WS11	-	4	-	-	REFUSAL	-	-
WS12	18	-	-	-	45	REFUSAL	-
WS13	18	-	-	-	REFUSAL	-	-
WS14	-	REFUSAL	-	-	-	-	-
WS15	-	REFUSAL	-	-	-	-	-

8.1.14.3 The SPT tests generally proved soft to stiff clays with refusals recorded in the underlying mudstone and sandstone strata.

8.1.5 ROTARY BOREHOLES

8.1.15.1 The rotary boreholes on site generally proved 0.3m of topsoil overlying 0.9-1.9m of sandy clays. Underlying the clays was primarily sandstone and siltstone, with mudstone also recorded in the higher north and western areas of the site. In the majority of the boreholes a 2.2-3.7m band of black shale was encountered.

8.1.15.2 Four of the rotary boreholes recorded a 0.1-0.8m thick unworked coal seam at the base of the black shale at depths of 9.4-27.7m below existing ground levels. The coal was shallowest adjacent the recorded outcrops crossing the site, where there was less than 10 times the seam thickness of competent rock cover in only BH10.

8.1.15.3 A summary of the strata encountered within the boreholes undertaken across the entire site is presented in Table 3 below:

Table 3 Summary of Strata within boreholes (June 2021)

Borehole No.	Topsoil (m)	Clay (m)	Sandstone (m)	Mudstone (m)	Black Shale (m)	Siltstone/ Sandstone (m)	Rock Cover (m)	Coal Seam (m)	10x seam cover	Water Strike
1	0.0-0.3	0.3-1.7	1.7-5.8	5.8-9.7	-	9.7-13.0	>11.3	-	-	1.6m
1A	0.0-0.3	0.3-1.7	1.7-5.8	5.8-9.6	-	9.6-30.0	>28.3	-	-	4.3m
2G	0.0-0.3	0.3-2.0	2.0-3.0	-	-	-	>1.0	-	-	-
3	0.0-0.3	0.3-2.2	-	2.2-9.1	9.1-11.5	11.5-30.0	>27.8	-	-	7.3m
4	0.0-0.3	0.3-1.9	1.9-5.3	5.3-24.8	24.8-27.3	27.3-30.0	>28.1	-	-	8.2m
5G	0.0-0.3	0.3-1.9	1.9-3.0	-	-	-	>1.1	-	-	-
6	0.0-0.3	0.3-1.7	1.7-3.8 9.5-18.2	3.8-9.5	18.2-20.4	20.4-30.0	>28.3	-	-	1.9m
7	0.0-0.3	0.3-1.6	1.6-21.1	-	21.1-23.5	23.5-30.0	>28.4	-	-	9.0m
8G	0.0-0.3	0.3-1.9	1.9-3.0	-	-	-	>1.1	-	-	-
9	0.0-0.3	0.3-2.3	2.3-7.9	-	7.9-11.6	11.6-30.0	>27.7	-	-	6.3m
10	0.0-0.3	0.3-1.7	1.7-7.8	-	7.8-9.4	10.2-30.0	7.7	9.4-10.2	N	6.3m
11	0.0-0.3	0.3-1.2	1.2-19.2	-	19.2-24.0	24.8-30.0	22.8	24.0-24.8	Y	-
12	0.0-0.3	0.3-1.2	1.2-23.3	-	23.3-26.5	27.3-30.0	25.3	26.5-27.3	Y	-
13G	0.0-0.3	0.3-1.8	1.8-3.0	-	-	-	>1.2	-	-	-
14	0.0-0.3	0.3-2.1	2.1-24.1	-	24.1-27.0	27.7-30.0	24.9	27.0-27.7	Y	-
15G	0.0-0.3	0.3-2.1	2.1-3.0	-	-	-	>0.9	-	-	-

8.1.16 SOAKAWAY TESTS

8.1.16.1 As discussed previously in the report, two of the trial pits were used to carry out soakaway tests in order to obtain an infiltration rate for the development. This was undertaken in TP01 and TP05 in the higher north west and south west of the site. Further soakaway tests were not undertaken due to the ingress of ground water noted during the trial pit excavations.

8.1.16.2 The infiltration rate has been calculated between the 75% and 25% full values as recommended in the BRE Digest 365. The soakaway result is included in Appendix B and is summarised in Table 4 below:-

Table 4 Summary of infiltration rates

SOAKAWAY NUMBER	INFILTRATION RATE m/s x10⁻⁶
TP01 (TEST 1)	115.4
TP01 (TEST 2)	87.4
TP05 (TEST 1)	930.2
TP05 (TEST 2)	291.6

8.1.16.3 Although these two soak-a-way tests recorded rapid infiltration rates over both tests, six of the other trial pits recorded groundwater ingress. TP06 was left open for several hours and the water levels rose to 1.3m below existing ground level.

8.2 GROUNDWATER

8.2.1 Groundwater seepage was noted in TP02, TP03, TP06, TP07, TP08 and TP09 at depths of 1.4-2.6m below existing ground levels. TP06 was left open for several hours and the groundwater level rose to within 1.3m of the surface level.

8.2.2 Water strikes were recorded in eight of the fourteen boreholes at depths of 1.6-9.0m below ground level. Only WS11 of the window samples recorded a water strike at 1m below existing ground levels. During the gas monitoring, water levels have been recorded between the surface and 2.70m below ground level. The highest groundwater level has been recorded in R15 adjacent to the stone culverts crossing the site.

- 8.2.3 It should be recognised that ground water levels may vary throughout the year. During periods of heavy rainfall the groundwater levels may be substantially higher than the results revealed in these investigations.

8.3 GAS MONITORING

- 8.3.1 As discussed previously R02, R05, R08, R13 and R15 were installed with gas standpipes and lockable covers. Gas testing is currently being undertaken on site and to-date the wells have been monitored on five occasions.
- 8.3.2 A standard gas monitoring procedure has been followed in accordance with CIRIA guidance, including measurement of the following:-
- i) Methane, Oxygen and Carbon Dioxide concentrations.
 - ii) Atmospheric Pressure.
 - iii) Gas Flow Rate.
 - iv) Standing water level.
- 8.3.3 The result of the monitoring undertaken to-date is summarised in Table 5 below. A complete set of results will be reported on completion of the intended testing programme.

Table 5 - Summary of Recorded Gas Levels.

Borehole No.	Date	Oxygen %	Carbon Dioxide %	Methane %	Steady Flow Rate (l/hr)	Depth to Water (m)	Atmospheric Pressure (mb)
R02	23.02.22	20.0	0.8	NR	ND	0.10	978
	09.03.22	20.1	1.2	NR	-4.5	0.90	980
	22.03.22	20.0	1.3	NR	ND	1.90	1000
	07.04.22	18.4	2.5	NR	ND	1.90	958
	20.04.22	18.5	2.2	NR	ND	2.10	988
R05	23.02.22	19.2	2.3	NR	ND	1.30	978
	09.03.22	17.3	2.4	NR	ND	1.90	980
	22.03.22	18.2	2.3	NR	ND	2.20	999
	07.04.22	18.3	2.6	NR	ND	DRY	958
	20.04.22	17.6	2.4	NR	ND	2.60	987
R08	23.02.22	19.6	1.2	NR	ND	2.10	979
	09.03.22	17.6	2.2	NR	ND	2.30	980
	22.03.22	18.8	2.4	NR	ND	DRY	999
	07.04.22	18.4	2.3	NR	ND	2.70	959
	20.04.22	MONITORING STATION FLOODED					
R13	23.02.22	19.1	2.1	NR	4.0	0.90	979
	09.03.22	18.4	2.3	NR	ND	1.60	981
	22.03.22	17.9	2.2	NR	ND	DRY	998
	07.04.22	19.4	1.8	NR	0.8	DRY	960
	20.04.22	17.9	2.0	NR	ND	DRY	988
R15	23.02.22	16.7	4.8	NR	15.6	0.70	979
	09.03.22	MONITORING STATION FLOODED					
	22.03.22	17.1	4.6	NR	0.8	0.90	998
	07.04.22	MONITORING STATION FLOODED					
	20.04.22	18.7	1.7	NR	ND	DRY	989

8.3.4 A maximum carbon dioxide concentration of 4.8% was recorded in R15. No methane has been detected in any of the monitoring stations during the monitoring. The first four readings have been undertaken during falling atmospheric pressure.

8.3.5 A maximum steady flow rate of 15.6 l/hr has been detected in R15 during the monitoring. However, it is noted that the gas flow rates recorded correspond to the water levels being above the top of the response zone, hence it is likely that the flow rates are related directly to pressure / vacuum effects within the partly-flooded borehole, rather than relating to gas ingress / migration. Where the groundwater has not flooded the response zone, no flow rates have been detected.

8.3.6 Based on the maximum concentrations of carbon dioxide measured, the gas regime found on this site can be currently classified as **CS1** by BS 8485:2015 Table 2.

9.0 CONTAMINATION

9.1 HUMAN HEALTH RISK ASSESSMENT

9.1.1 The appraisal of contaminated land within the UK is based on a risk assessment approach. The method involves the principle of defining a source ► pathway ► receptor, linkage to establish a human health risk. For any risk to exist to a potential receptor from an identified contaminant there must be an unbroken source ► pathway ► target relationship.

9.1.2 In the first instance site data for the contaminant levels are compared against guidance such as the CLEA values published by DEFRA. Should the site values exceed the guidance criteria, the contamination levels are recognised to have the potential to pose a risk to human health. Two scenarios are then available:-

- a) To break or remove one of the source ► pathway ► receptor linkages, by specifying an appropriate level of remedial work. Examples of remedial action may include the removal of the contaminated material or alternatively specifying a sufficient capping layer.
- b) The alternative approach is to provide a more detailed human health site specific risk assessment. This will involve examining factors such as soil properties, exposure assumptions, groundwater flows and contamination composition.

9.2 CONTAMINATION RESULTS

9.2.1 As stated above, in order to put the analytical results into context, the data has in the first instance been assessed in relation to several sets of guidelines: -

9.2.2 The analytical results have been assessed via an initial screening assessment with regard to the current Contaminated Land Exposure Assessment model (CLEA UK) for human health, which has been produced for the Environment Agency and the Department of Environment, Food and Rural Affairs (DEFRA). The CLEA model provides Soil Guideline Values (SGVs) for a limited range of contaminants only, and these are based on risk to human health. As such they do not take into account potential risks to other receptors eg groundwater and third party land.

- 9.2.3 It is proposed to redevelop the site for a business park with commercial industrial units and car parking. Soil results have therefore been assessed against the CLEA SGV's for commercial use, as these are considered to be the most suitable guidelines to protect the most critical targets from contaminants via all possible exposure routes.
- 9.2.4 Where no CLEA SGV has been published, Generic Assessment Criteria (GAC) based on guidelines from the Chartered Institute of Environmental Health (CIEH) and Land Quality Management Ltd (LQM) S4UL document residential land use with plant uptake has been used. Where there is no GAC, guidance limits have been adopted from sources referenced in the table below.
- 9.2.5 A new approach has now been adopted for the calculation of SGV based on an acceptably low level of risk. These Category 4 Screening Levels (C4SL) have been calculated for six substances to date by modifying the toxicological/exposure parameters within CLEA. C4SLs have been used as tier 1 trigger levels within this assessment, superseding the previous CIEH and LQM SGVs.
- 9.2.6 Assessment of risk is considered as a tiered approach. Assessment based on non intrusive means is considered Tier 1 assessment, comparison against SGVs and GACs is a Tier 2 assessment, and the generation of and comparison with Site Specific Assessment Criteria (SSAC) is a Tier 3 assessment and is conducted where deemed appropriate following the Tier 2 assessment.
- 9.2.7 The sulphate and acid concentrations have been compared against the BRE digest "Concrete in Aggressive Ground" parts 1-4. This will enable the concrete class to be specified in relation to possible contact with aggressive soils.
- 9.2.8 The results of the chemical analysis are presented on the laboratory analysis sheets with Appendix C. A summary of the significance of the results is presented in Table 6.

Table 6**Comparison of contaminant against accepted guidance values for commercial use**

<u>CONTAMINANT</u>	<u>SGV</u> <u>MG/KG</u>	<u>CONCENTRATION IN</u> <u>ALL SOILS.</u> <u>MG/KG</u>	<u>No. OF</u> <u>SAMPLES</u> <u>EXCEEDING</u> <u>GUIDANCE</u> <u>VALUES</u>	<u>PERCENTAGE</u> <u>OF SAMPLES</u> <u>EXCEEDING</u> <u>GUIDELINE</u> <u>VALUE</u>
Arsenic	40 (4)	3.6-20	0/13	
Cadmium	220 (4)	<0.1-0.6	0/13	
Chromium (Total)	130 (2)	15-33	0/13	
Lead	2300 (4)	46-530	0/13	
Mercury (Total)	58 (1)	<0.05-0.21	0/13	
Selenium	12000 (1)	<0.5-1.2	0/13	
Copper	68000(1)	27-63	0/13	
Nickel	980 (1)	15-46	0/13	
Zinc	730000 (1)	76-390	0/13	
Sulphate	0.24% (3)	0.02-0.09%	0/13	
Thiocyanate	50	0.7-3.9	0/13	
Sulphide	250	<10-55	0/13	
Naphthalene	190 (1)	<0.1-1.3	0/13	
Benzo(a)pyrene	77 (4)	<0.1-4.2	0/13	
Dibenzo[ah]anthracene	3.5 (1)	<0.1-0.6	0/13	
PAH (Total)	100	<1.6-78	0/13	
Phenols	760 (1)	<0.3-0.8	0/13	
Asbestos	No fibres	No fibres	0/11	
pH	6-8	5.5-7.1	5/13	

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(2) DEFRA CLR SGV's withdrawn used for initial comparison

(3) BS 8110 1985 Table 6.1

(4) Category 4 Screening Levels

9.2.9 No elevated levels of heavy or phytotoxic metals were recorded within the samples taken from site.

9.2.10 No elevated levels of PAH (Total) or individual PAH compounds were recorded within the samples taken from site.

9.2.11 No asbestos fibres were recorded in the samples taken from site.

9.3 **QUALITATIVE RISK ASSESSMENT**

9.3.1 The Qualitative Risk Assessment is based upon the previously discussed source ► pathway ► receptor principle. In relation to the proposed site these may be described as follows:-

9.3.2 **SOURCE**

- i) No contaminants identified on site.

9.3.3 **PATHWAYS**

- i) Ingestion of contamination material.
- ii) Inhalation of contaminated particles.
- iii) Dermal contact with the known contamination.
- iv) Leaching to controlled waters.

9.3.4 **RECEPTORS**

- i) Commercial site users.
- ii) Construction and maintenance workers.
- iii) Controlled waters.
- iv) The building structure.

9.3.5 Each of the receptors will now be appraised and attribute the likely risks involved.

i) Commercial site users.

Based on the chemical results obtained it is considered that there is currently a **negligible** risk to end users from contamination on-site.

No elevated levels of contaminants were proved in the samples from site compared to the tier 1 trigger levels for commercial usage.

A maximum carbon dioxide concentration of 4.8% was recorded in R15. No methane has been detected in any of the monitoring stations during the monitoring. A maximum steady flow rate of 15.6 l/hr has been detected in R15 during the monitoring.

Based on the maximum concentrations of carbon dioxide recorded, the gas regime found on this site can be currently classified as **CS1** by BS 8485:2015 Table 2.

ii) Construction and Maintenance Workers.

It is considered that there is a **low** risk to construction and maintenance workers from the redevelopment of the site.

Construction workers should always wear PPE including overalls, boots and gloves when handling the contaminated materials onsite. In addition eating, drinking and smoking should be restricted to designated areas where the above hygiene facilities are available.

iii) Controlled Waters

The site has proven to be underlain by a relatively impermeable clays underlain by mudstone. It is therefore considered that there is a negligible risk to groundwater and controlled waters from existing contamination on site.

iv) Building Structures.

No elevated levels of sulphate were recorded in the samples taken from site. However, due to the low pH levels on site, we would recommend design sulphate class DS-1, ACEC class AC-2z is adopted for the site, when compared against the BRE Special Digest 1 "Concrete in aggressive ground".

Service providers should be forwarded the final validated chemical levels in order for them to provide an accurate specification for the apparatus to be provided. New services should be surrounded and backfilled with clean material to afford some protection to the apparatus and allow any future maintenance work to be undertaken in clean material.

10.0 CONCLUSIONS AND RECOMMENDATIONS

10.1 GEOTECHNICAL ASSESSMENT

- 10.1.1 The fieldwork generally a shallow depth of clays overlying a mudstone/sandstone bedrock. For initial design purposes we would envisage a safe bearing capacity of 150kN/m² where foundations are extended onto the mudstone/sandstone strata.
- 10.1.2 We would therefore suggest that the commercial units should be constructed on strip/trench fill and pad footings founded entirely onto the mudstone/sandstone strata with ground bearing floor slabs. The foundation widths and depths will vary dependent upon the line and point loadings calculated.
- 10.1.3 Due to the steep nature of the site, it is likely that re-levelling works will be required to accommodate the proposed commercial units and parking areas. As the proposed ground levels may rise in areas of the development, a final decision on the foundation construction should be made following the completion of the external works and confirmation of final finished floor levels. Consideration may need to be given to piled foundations dependent on the depth to suitable founding material.
- 10.1.4 Where shallow coal is encountered within the foundation excavations, the foundations should be extended beneath the coal strata to underlying mudstone/sandstone. The exposed coal face should be sealed off to prevent combustion. This may result in deeper footings extending to the strata underlying the coal, or potential reinforced beams, above the coal, to span between deeper footings.
- 10.1.5 Trial trenching should be undertaken following a site strip to accurately locate the existing fault line as it was not possible to do this during the site investigation works. Additional reinforcement to foundations and movement joints in the superstructure will potentially be required dependent on the location of the fault line.
- 10.1.6 During remediation works, a watching brief should be undertaken for evidence of the historical wells in the north east of the site and the anecdotal quarry adjacent the southern boundary. Should any features be encountered in the underlying natural strata, these should be surveyed and reported to determine the effect on the proposed development and allow a remediation strategy to be agreed.

- 10.1.7 All foundations should be placed below a line of 45deg drawn up from the base of any services or other structures.
- 10.1.8 If any existing foundations or structures are encountered during construction, these should be totally removed from the excavations to enable the new foundations to be constructed without obstructions. In particular, there may be relic foundations in the northern half of the site where the concrete slab was encountered.
- 10.1.9 At present it is not anticipated that excessive ground water control measures will be required, however, elevated ground water was encountered within the trial pits and boreholes. Please note that ground water flows can vary throughout the year and a further assessment should be undertaken if construction work is proposed following a prolonged rainfall event. Some precautions are likely to be required in supporting open trenches and to prevent surface water run-off leaving the site following a site scrape due to the impermeable nature of the clays on site.
- 10.1.10 No elevated levels of sulphate were recorded in the samples taken from site. However, due to the low pH levels on site, we would recommend design sulphate class DS-1, ACEC class AC-2z is adopted for the site, when compared against the BRE Special Digest 1 "Concrete in aggressive ground".
- 10.1.11 Where any foundations are located near existing or proposed new trees, their foundations must be sited below the root growth zone. Reference should be made to the NHBC standards Chapter 4.2 "Building Near Trees" which provides guidance on foundation criteria, depths and construction. All services should be similarly protected. Plasticity testing of the clays on site has shown them to be of low volume change potential.

10.2 MINING AND QUARRYING

- 10.2.1 Two inferred coal seams are shown outcropping the site from the north west of the site to the south east. Probable shallow mine workings associated with these seams are shown across the majority of the site. It is considered unlikely that this will have been worked using underground methods due to the thin nature and poor quality of the seam, however it is considered possible it may have been extracted using bellpits.

10.2.2 The boreholes on site generally proved 0.3m of topsoil overlying 0.9-1.9m of sandy clays. Underlying the clays was primarily sandstone and siltstone, with mudstone also recorded in the higher north and western areas of the site. In the majority of the boreholes a 2.2-3.7m band of black shale was encountered.

10.2.3 Four of the boreholes recorded a 0.1-0.8m thick unworked coal seam at the base of the black shale at depths of 9.4-27.7m below existing ground levels. The coal was shallowest adjacent the recorded outcrops crossing the site, where there was less than 10 times the seam thickness of competent rock cover in only R10.

10.2.4 In addition to this, TP07, TP09 and WS13 in the south east of the site encountered coal at shallow depth.

- In TP07 a 0.1m thick immature coal seam was encountered at 0.8-0.9m below existing ground levels.
- In TP09, a 0.2m thick weathered coal seam and a 0.3m thick very weak coal seam were encountered at 0.4-0.6 and 2.1-2.4m below existing ground levels. This is likely to be a single seam that split as it outcropped.
- WS13 recorded a 1m thick weak coal seam was encountered at 1.0-2.0m below existing ground levels. This is potentially an exaggerated seam thickness from an upturn in the coal seam as it outcrops.

10.2.5 None of the seams encountered showed evidence of being worked. However, due to the shallow nature of the coal adjacent the recorded outcrops, it is considered possible that the coal may have been worked and extracted from the surface through the use of bellpits. It is therefore recommended that a site scrape is undertaken during development to allow a visual inspection of the underlying natural strata to determine the presence of any features.

10.3 GROUND FLOOR SLAB – GAS MEASURES

10.3.1 As discussed previously, gas monitoring stations were installed in five of the boreholes undertaken on site.

10.3.2 A maximum carbon dioxide concentration of 4.8% was recorded in R15. No methane has been detected in any of the monitoring stations during the monitoring. The initial four readings have been undertaken during falling atmospheric pressure.

- 10.3.3 A maximum steady flow rate of 15.6 l/hr has been detected in R15 during the monitoring. However, it is noted that the gas flow rates recorded correspond to the water levels being above the top of the response zone, hence it is likely that the flow rates are related directly to pressure / vacuum effects within the partly-flooded borehole, rather than relating to gas ingress / migration. Where the groundwater has not flooded the response zone, no flow rates have been detected.
- 10.3.4 Based on the maximum concentrations of carbon dioxide measured, the gas regime found on this site can be currently classified as CS1 by BS 8485:2015 Table 2.
- 10.3.5 No Radon Protection measures are required for the site.
- 10.3.6 The gas monitoring is ongoing and a final categorisation of the gas regime for the development will be provided in a separate report on the completion of the monitoring.

10.4 CONTAMINATION ASSESSMENT

- 10.4.1 No elevated levels of contaminants were recorded in the samples taken from site when compared to the tier 1 trigger levels for commercial use.
- 10.4.2 No asbestos fibres were detected in the samples taken from site.
- 10.4.3 Outside the footprint of the proposed industrial unit, it is proposed to have tarmacked hardstanding which will sever the contamination pathways from the made ground to future site users. There is therefore considered to be negligible risk to future users from the existing ground contamination.
- 10.4.4 The chemical analysis undertaken on the samples of topsoil from the site have proved it suitable for re-use on site. Prior to construction works commencing on site, it is recommended that the existing topsoil is scraped and stockpiled behind protective fencing to prevent cross contamination during the construction work.
- 10.4.5 It is not anticipated that any topsoils or subsoils will need to be imported to site for the soft landscaped areas.

10.4.6 Should any further suspected areas of contamination be exposed during site strip/construction, an engineer should be contacted to determine if additional chemical testing should be undertaken. The on-site staff should maintain a photographic record and dates of any exposed contaminated material.

10.5 SURFACE WATER DRAINAGE

10.5.1 Although the two soak-a-way tests undertaken recorded rapid infiltration rates over both tests, six of the other trial pits recorded groundwater ingress. TP06 was left open for several hours and the water levels rose to 1.3m below existing ground level. During the gas monitoring, water levels have been recorded between ground level and 2.70m below ground level.

10.5.2 Additionally, due to the steep nature of the site there is the possibility for re-emergence of water downhill from the soakaways. Finally, due to the re-levelling required to develop the site, it may prove impractical to construct soakaways through the re-engineered ground to the underlying natural strata.

10.5.2 We would therefore not consider infiltration methods a suitable long term drainage solution for the development.

10.5.3 A discharge rate and point of connection to the will need to be agreed with Kirklees Council Lead Local Flood Authority and Yorkshire Water.

11.0 SUGGESTED FURTHER WORK

- 11.1 Exact location of fault line to be determined by further trial trenching following site strip prior to construction.
- 11.2 Watching brief to be undertaken during site strip for evidence of mining features, m,historical wells in north east of site and anecdotal quarry adjacent southern boundary. Any features encountered to be surveyed and reported to all any necessary remediation strategies to be agreed.
- 11.3 Gas monitoring to be completed and report prepared detailing any gas protection measures required.
- 11.4 Possible trace survey of existing land drainage to be undertaken to determine if any diversion works are required to accommodate the proposed development.

12.0 APPROVALS

12.1 Proposals for the remediation of contaminated land may require the approval of numerous bodies.

These include:

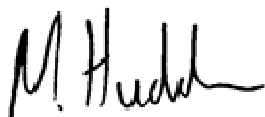
- a) Kirklees Council Environmental Health Department as required by the building and planning regulations.
- b) The NHBC or similar as they will provide the insurance costs to cover the property.
- c) The Environment Agency if there are risks of contamination to ground or surface water systems. They will also require notification if material is removed from site and taken to an appropriate tip.
- d) Relevant highways and drainage authorities and other service companies may also wish to know about the level of contaminants.
- e) Building Control and the Coal Authority regarding the mineshaft remediation works.

Prepared by



M. Dean. BSc (Hons) HND

Checked by



M. Huddleston. Meng

April 2022

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APPENDIX A

Site Location Plan

Site investigation Plan

Groundwater Movement Plan

Typical Site Conceptual Model



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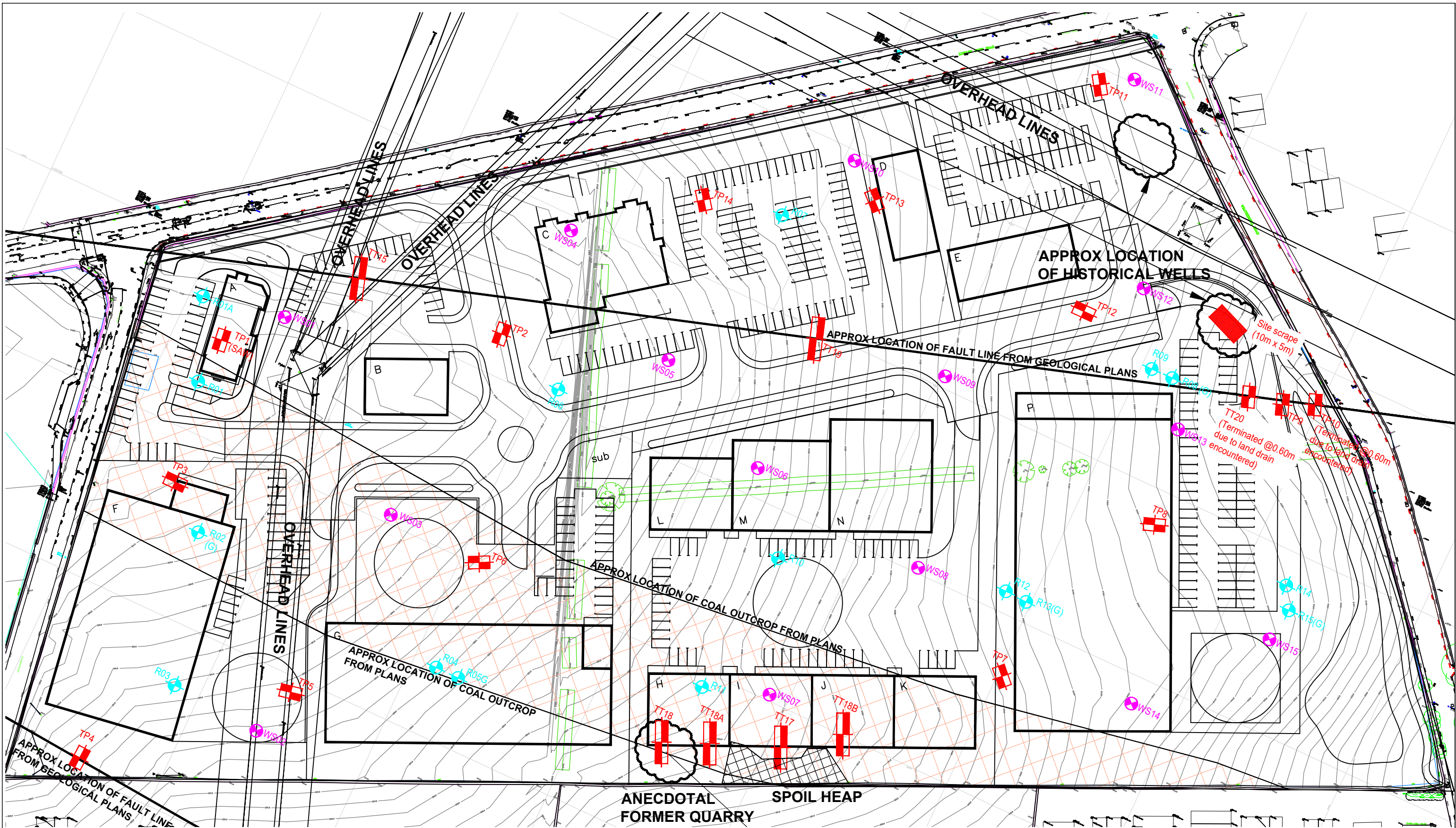
Client : 2SH Developments Ltd
Job Title: Lindley Moor Road, Huddersfield
Job Number : E21/7768

LOCATION PLAN

OS Grid Reference : SE 109190
Easting : 410924
Northing : 419016

Topographical Survey carried out
using GPS.





- TRIAL TRENCH LOCATION
- TRIAL PIT LOCATION
- BOREHOLE LOCATION
- WINDOW SAMPLE LOCATION

Rev B Updated to suit site investigation works
Rev A Updated to suit revised planning layout

11.02.22 JF
17.12.21 MD

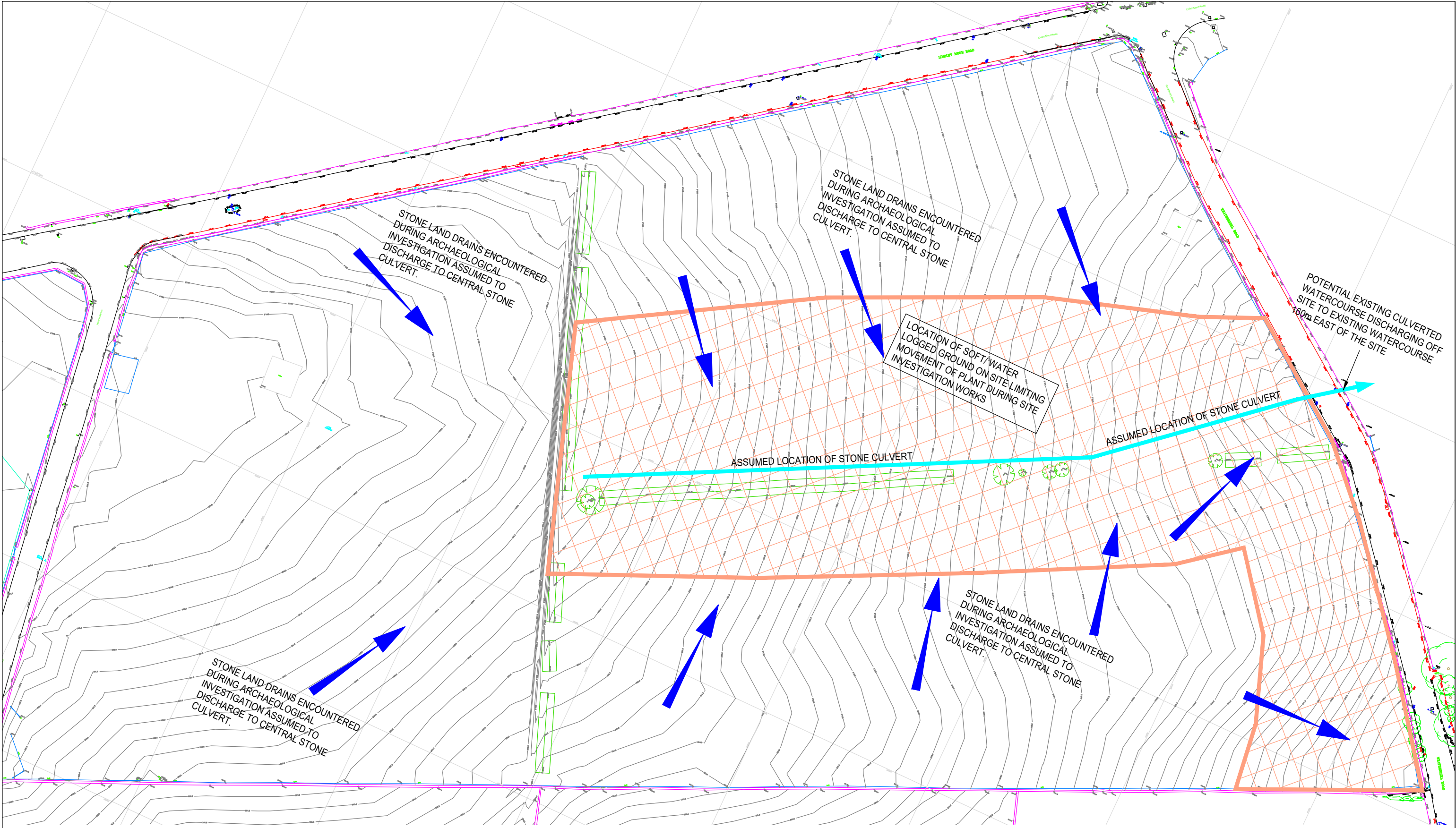


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Client	2SH Developments Ltd				
Project	Lindley Moor Road, Huddersfield				
Detail	Site Investigation Plan				
Scale	Dwn	Chkd	Date	Dwg No.	
1:1000	MD		Sep'21	E20/7768/03B	



KEY:

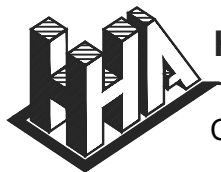
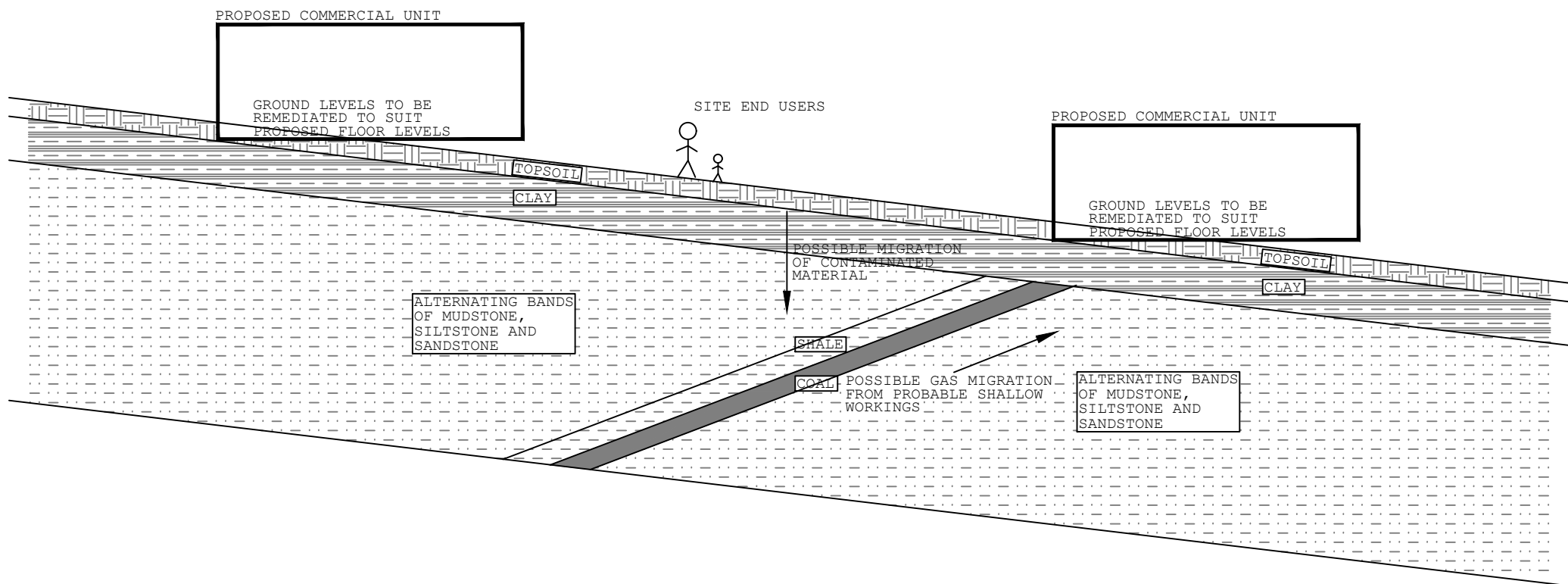
 DIRECTION OF FLOW OF GROUND WATER

 LOCATION OF SOFT/ WATER LOGGED GROUND ON SITE LIMITING MOVEMENT OF PLANT DURING SITE INVESTIGATION WORKS



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Client				
2SH Developments Ltd				
Project				
Lindley Moor Road, Huddersfield				
Detail				
GROUND WATER MOVEMENT PLAN				
Scale	Dwn	Chkd	Date	Dwg No.
1:1000	JF		Apr'22	E20/7768/200



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Client

2SH Developments Ltd

Project

Lindley Moor Road, Huddersfield

Detail

Typical Site Conceptual Model

Scale
NTS

Dwn
MD

Chkd

Date
Apr'22

Dwg No.
E20/7768/32

APPENDIX B

Trial Hole Logs

Window Sample Logs

Borehole Logs

Soakaway Test

TRIAL HOLE NO. 1



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Client :	MWA	Job No :	7768
Site :	LINDLEY	Date :	8 FEBRUARY 2022

0.0		
	0.3	Rough grass over dark brown topsoil containing occasional gravels. Sample taken at 0.2m.
0.5		Soft/firm brown very sandy clay with numerous sandstone gravels.
1.0		
	1.1	
	1.4	Weak grey highly weathered mudstone excavated as thinly bedded shaley gravels.
1.5		Moderately strong light brown sandstone becoming difficult to excavate. Excavated as angular gravels.
	1.6	
2.0		
2.5		
3.0		
3.5		
4.0		

REMARKS:

Ground water encountered during excavation

NO

Sample taken

YES at 0.2m.

Sides of excavation remained stable

YES

Level

.....

NOTES:

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TRIAL HOLE NO. 2



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Client :	MWA	Job No :	7768
Site :	LINDLEY	Date :	8 FEBRUARY 2022

0.0		
	0.3	Rough grass over dark grey topsoil.
0.5		Sample take at 0.4m.
	0.6	Weathered sandstone excavated as angular cobbles in an orange clay.
1.0		Weathered light brown sandstone excavated as angular gravels and cobbles.
1.5		Struggling to excavate.
	1.6	Groundwater entering trial pit.
2.0	2.0	Moderately weak light grey mudstone excavated as shaley gravels.
2.5		
3.0		
3.5		
4.0		

REMARKS:

Ground water encountered during excavation YES at 1.6m.
 Sample taken YES at 0.4m.
 Sides of excavation remained stable YES
 Level

NOTES:

.....

TRIAL HOLE NO. 3



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t 01924 464342 f 01924 450662 e martin@haighhuddleston.co.uk

Client :	MWA	Job No :	7768
Site :	LINDLEY	Date :	8 FEBRUARY 2022

0.0		
	0.2	Rough grass over dark grey topsoil. Sample taken at 0.1m.
	0.4	Orange sandy clay with sandstone cobbles.
0.5		Light brown weathered sandstone excavated as angular gravels and cobbles in a sandy matrix.
1.0		Groundwater ingress at 1.4m.
1.5		Moderately weak grey mudstone excavated as shaley gravels.
2.0		
2.5		
3.0		
3.5		
4.0		

REMARKS:

Ground water encountered during excavation YES at 1.4m
 Sample taken YES at 0.1m
 Sides of excavation remained stable YES
 Level

NOTES:

.....

TRIAL HOLE NO. 4



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Civil & Structural Engineering Consultants

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Client :	MWA	Job No :	7768
Site :	LINDLEY	Date :	8 FEBRUARY 2022

0.0		
	0.3	Rough grass over dark grey topsoil.
0.5		Soft to firm orange mottled grey clay. Sample taken at 0.5m.
1.0		
	1.4	
1.5		Moderately weak dark grey shaley mudstone excavated as small angular gravels. Occasionally ironstained.
2.0		
2.5	2.5	
3.0		
3.5		
4.0		

REMARKS:

Ground water encountered during excavation

NO

Sample taken

YES at 0.5m.

Sides of excavation remained stable

YES

Level

.....

NOTES:

.....

TRIAL HOLE NO. 5



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Civil & Structural Engineering Consultants

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Client :	MWA	Job No :	7768
Site :	LINDLEY	Date :	8 FEBRUARY 2022

0.0		
		Rough grass over dark grey topsoil. Sample taken at 0.1m.
	0.3	
		Soft to firm orange clays with sandstone gravels.
0.5	0.5	
		Moderately weak sandstone horizontally bedded excavated as shale.
1.0		
1.5		
	1.6	Unable to excavate further.
2.0		
2.5		
3.0		
3.5		
4.0		

REMARKS:

Ground water encountered during excavation

NO

Sample taken

YES at 0.1m.

Sides of excavation remained stable

YES

Level

.....

NOTES:

.....

.....

TRIAL HOLE NO. 6



Haigh Huddleston & Associates

Civil & Structural Engineering Consultants

Firth Buildings, 99 - 101 Leeds Road, Dewsbury, WF12 7BU

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Client :	MWA	Job No :	7768
Site :	LINDLEY	Date :	8 FEBRUARY 2022

0.0		
	0.3	Sample taken at 0.1m. Rough grass over dark grey topsoil.
0.5		Sample taken at 0.5m.
		Soft to firm orange mottled grey clay.
1.0		
		Groundwater rest to 1.3m.
1.5		
	1.8	
2.0		Moderately weak weathered light brown mudstone excavated as shaley gravels.
	2.1	Groundwater at base 100mm after 10 minutes.
2.5		
3.0		
3.5		
4.0		

REMARKS:

Ground water encountered during excavation YES
 Sample taken YES at 0.1m & 0.5m
 Sides of excavation remained stable YES
 Level

NOTES:

.....

TRIAL HOLE NO. 7



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Civil & Structural Engineering Consultants

Firth Buildings, 99 - 101 Leeds Road, Dewsbury, WF12 7BU

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Client :	MWA	Job No :	7768
Site :	LINDLEY	Date :	8 FEBRUARY 2022

0.0		
	0.3	Rough grass over dark grey topsoil.
0.5		Soft to firm orange clay. Sample taken at 0.5m.
	0.8	
	0.9	Soft black immature coal.
1.0		Soft to firm light brown mottled grey clay.
	1.3	
1.5		Weathered grey sandstone excavated as flaggy gravels. Difficult to excavate.
	1.8	Groundwater ingress at base.
2.0		
2.5		
3.0		
3.5		
4.0		

REMARKS:

Ground water encountered during excavation YES
 Sample taken YES at 0.5m
 Sides of excavation remained stable YES
 Level

NOTES:

.....

TRIAL HOLE NO. 8



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Civil & Structural Engineering Consultants

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Client :	MWA	Job No :	7768
Site :	LINDLEY	Date :	8 FEBRUARY 2022

0.0		
	0.3	Sample taken at 0.1m. Rough grass over dark grey topsoil.
0.5		
1.0		
	1.3	
1.5		
	1.8	Moderately strong grey mudstone excavated as shaley gravels, difficult to excavate.
		Groundwater ingress at base.
2.0		
2.5		
3.0		
3.5		
4.0		

REMARKS:

Ground water encountered during excavation

NO

Sample taken

YES at 0.1m & 0.5m.

Sides of excavation remained stable

YES

Level

.....

NOTES:

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TRIAL HOLE NO. 9



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Civil & Structural Engineering Consultants

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Client :	MWA	Job No :	7768
Site :	LINDLEY	Date :	9 FEBRUARY 2022

0.0		
	0.2	Rough grass over dark brown topsoil.
	0.4	Soft light brown/grey mottled clay.
0.5	0.6	Weak black highly weathered mature coal.
		Soft light brown/grey mottled clay.
1.0		
1.5		
2.0	2.1	
	2.4	Very weak black mature coal.
2.5	2.6	Very weak light grey mudstone.
		Water ingress into base of trial pit.
3.0		
3.5		
4.0		

REMARKS:

Ground water encountered during excavation YES
Sample taken NO
Sides of excavation remained stable YES
Level

NOTES:

.....
.....

TRIAL HOLE NO. 10



Haigh Huddleston & Associates

Civil & Structural Engineering Consultants

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Client :	MWA	Job No :	7768
Site :	LINDLEY	Date :	9 FEBRUARY 2022

0.0		
	0.4	Rough grass over dark brown topsoil.
0.5	0.5	Strong light brown angular sandstone boulders. Land drain encountered.
		Depth to base of land drain = 0.6m.
1.0		
1.5		
2.0		
2.5		
3.0		
3.5		
4.0		

REMARKS:

Ground water encountered during excavation NO
 Sample taken NO
 Sides of excavation remained stable YES
 Level

NOTES:

.....

TRIAL HOLE NO. 11



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Civil & Structural Engineering Consultants

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Client :	MWA	Job No :	7768
Site :	LINDLEY	Date :	9 FEBRUARY 2022

0.0		
	0.2	Rough grass over dark brown topsoil.
0.5		Moderately firm light brown clay.
	0.6	
	0.8	Weak grey mudstone shales.
1.0	1.0	Strong light grey/brown mudstone becoming difficult to excavate.
1.5		
2.0		
2.5		
3.0		
3.5		
4.0		

REMARKS:

Ground water encountered during excavation NO

Sample taken NO

Sides of excavation remained stable YES

Level

NOTES:

.....

.....

TRIAL HOLE NO. 12



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Civil & Structural Engineering Consultants

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Client :	MWA	Job No :	7768
Site :	LINDLEY	Date :	9 FEBRUARY 2022

0.0		
	0.3	Rough grass over dark brown topsoil.
0.5		Light brown gravelly clay excavated loosely.
	0.7	
		Weak light grey/brown mudstone excavated as shale.
1.0		
	1.4	
1.5		Weak light grey mudstone within a clay matrix.
2.0	2.0	
		Moderately strong becoming strong light grey angular mudstone becoming difficult to excavate.
	2.2	
2.5		
3.0		
3.5		
4.0		

REMARKS:

Ground water encountered during excavation NO
 Sample taken NO
 Sides of excavation remained stable YES
 Level

NOTES:

.....

TRIAL HOLE NO. 13



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Client :	MWA	Job No :	7768
Site :	LINDLEY	Date :	9 FEBRUARY 2022

0.0		
	0.2	Rough grass over dark brown topsoil.
0.5		Weak light brown/grey shaley mudstone excavated loosely.
	0.8	
1.0		Weak becoming strong light brown/grey sandstone excavated as angular slabs difficult to excavate further.
	1.2	
1.5		
2.0		
2.5		
3.0		
3.5		
4.0		

REMARKS:

Ground water encountered during excavation NO
 Sample taken NO
 Sides of excavation remained stable YES
 Level

NOTES:

.....

TRIAL HOLE NO. 14



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Client :	MWA	Job No :	7768
Site :	LINDLEY	Date :	9 FEBRUARY 2022

0.0		
	0.2	Rough grass over dark brown topsoil.
0.5		Soft light brown slightly sandy gravelly clay.
	0.8	
1.0		Weak light brown/grey shaley mudstone excavated loosely.
1.5		
	1.8	
2.0		Strong light brown/grey mudstone becoming difficult to excavate.
	2.3	
2.5		
3.0		
3.5		
4.0		

REMARKS:

Ground water encountered during excavation NO
 Sample taken NO
 Sides of excavation remained stable YES
 Level

NOTES:

.....

TRIAL HOLE NO. 15



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Client :	MWA	Job No :	7768
Site :	LINDLEY	Date :	9 FEBRUARY 2022

0.0		
	0.2	Rough grass over dark brown topsoil. Sample taken at 0.1m.
0.5		
	0.9	Weak light brown angular sandstone gravels within a sandy clayey matrix.
1.0		
	1.40	Weak grey mudstone excavated as loose gravels. Becoming difficult to excavate towards the north of the trial pit.
1.5	1.50	Moderately strong light grey mudstone becoming difficult to excavate NORTH
2.0		
2.5		
3.0		
3.5		

Weak grey mudstone excavated as loose gravels.

2.70

Moderately strong light grey mudstone becoming difficult to excavate.

2.85

SOUTH

REMARKS:

Ground water encountered during excavation

NO

Sample taken

YES at 0.1m.

Sides of excavation remained stable

YES

Level

.....

NOTES:

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.....

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TRIAL HOLE NO. 18



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Client :	MWA	Job No :	7768
Site :	LINDLEY	Date :	10 FEBRUARY 2022

0.0		
	0.2	Rough grass over dark brown topsoil.
0.5		Soft to firm orange clay with sandstone gravels and cobbles.
	0.7	
	0.8	Moderately weak grey mudstone excavated as shaley gravels.
1.0		
1.5		
2.0		
2.5		
3.0		
3.5		
4.0		

REMARKS:

Ground water encountered during excavation

NO

Sample taken

YES at 0.5m.

Sides of excavation remained stable

YES

Level

.....

NOTES:

.....

TRIAL HOLE NO. 18a



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Client :	MWA	Job No :	7768
Site :	LINDLEY	Date :	10 FEBRUARY 2022

0.0		
	0.2	Rough grass over dark brown topsoil.
0.5		Soft to firm orange clay with sandstone gravels and cobbles.
	0.7	
	0.8	Moderately weak grey mudstone excavated as shaley gravels.
1.0		
1.5		
2.0		
2.5		
3.0		
3.5		
4.0		

REMARKS:

Ground water encountered during excavation

NO

Sample taken

YES at 0.5m.

Sides of excavation remained stable

YES

Level

.....

NOTES:

.....

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TRIAL HOLE NO. 18b



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Civil & Structural Engineering Consultants

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Client :	MWA	Job No :	7768
Site :	LINDLEY	Date :	10 FEBRUARY 2022

0.0		
	0.2	Rough grass over dark brown topsoil.
0.5		Soft to firm orange clay with sandstone gravels and cobbles.
	0.7	
	0.8	Moderately weak grey mudstone excavated as shaley gravels.
1.0		
1.5		
2.0		
2.5		
3.0		
3.5		
4.0		

REMARKS:

Ground water encountered during excavation

NO

Sample taken

YES at 0.5m.

Sides of excavation remained stable

YES

Level

.....

NOTES:

.....

.....

TRIAL HOLE NO. 19



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Civil & Structural Engineering Consultants

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Client :	MWA	Job No :	7768
Site :	LINDLEY	Date :	10 FEBRUARY 2022

0.0		
	0.2	Rough grass over dark brown topsoil.
	0.5	Weak light brown angular sandstone gravels within a sandy clayey matrix.
	0.7	
	1.0	Weak grey mudstone excavated as loose gravels.
	1.4	
1.5		
2.0		
2.5		
3.0		
3.5		
4.0		

REMARKS:

Ground water encountered during excavation

NO

Sample taken

YES at 0.1m.

Sides of excavation remained stable

YES

Level

.....

NOTES:

.....

.....

TRIAL HOLE NO. 20



Haigh Huddleston & Associates

Civil & Structural Engineering Consultants

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Client :	MWA	Job No :	7768
Site :	LINDLEY	Date :	10 FEBRUARY 2022

0.0		
	0.4	Rough grass over dark brown topsoil.
0.5	0.5	Strong light brown angular sandstone boulders. Land drain encountered.
		Depth to base of land drain = 0.6m.
1.0		
1.5		
2.0		
2.5		
3.0		
3.5		
4.0		

REMARKS:

Ground water encountered during excavation NO
 Sample taken NO
 Sides of excavation remained stable YES
 Level

NOTES:

.....

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Civil Structural Engineering Consultants

Equipment & Methods	Client: 2SH Developments Limited							
	Site: Lindley Moor Road							
WINDOW SAMPLE No. 01	Ground Level							Date: 9.2.2022
Co-ordinates:								
Description	Reduced Level	Legend	Depth (thick)	Sample/Tests				SPT
				Depth	Sample		Test	
					Type	No.		
Dark brown topsoil.			0.1(0.1)	1.0				9,9,9,9,8,8
Soft/firm brown sandy gravelly clay.			1.0(0.9)					
Firm brown sandy clay with small Sandstone gravels and cobbles			2.0(1.0)					
Moderately strong light brown sandstone.								7,6,10,40/60
Remarks								Logged by
								Scale
								FIG

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Civil Structural Engineering Consultants

Equipment & Methods	Client: 2SH Developments Limited							
	Site: Lindley Moor Road							
WINDOW SAMPLE No. 02	Ground Level							Date: 9.2.2022
Co-ordinates:								
Description	Reduced Level	Legend	Depth (thick)	Sample/Tests				SPT
				Depth	Sample		Test	
					Type	No.		
Dark brown topsoil.			0.1(0.1)	1.0				4,4,5,5,5,5
Soft/firm brown sandy gravelly clay.			1.0(0.9)					
Firm brown sandy clay with small Sandstone gravels and cobbles			1.9(0.9)					
Moderately strong light brown sandstone.								8,12,20,30,20
Remarks								Logged by
								Scale
								FIG

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Civil Structural Engineering Consultants

Equipment & Methods	Client: 2SH Developments Limited							
	Site: Lindley Moor Road							
WINDOW SAMPLE No. 03	Ground Level							Date: 9.2.2022
Co-ordinates:								
Description	Reduced Level	Legend	Depth (thick)	Sample/Tests				SPT
				Depth	Sample		Test	
					Type	No.		
Dark brown topsoil.			0.1(0.1)	1.0				3,3,3,4,4,4
Soft/firm brown sandy gravelly clay.			1.0(0.9)					
Firm brown sandy clay with small amount of sandstone.			1.9(0.9)					
Moderately strong light brown sandstone.				1.9				10,15,20,10,10,5
Remarks								
Logged by								
Scale								
FIG								

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99-101 Leeds Road,
Dewsbury, WF12 7BU

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Equipment & Methods

Client: 2SH Developments Limited

Site: Lindley Moor Road

WINDOW SAMPLE No. 04

Ground Level

Date: 9.2.2022

Co-ordinates:

Description	Reduced Level	Legend	Depth (thick)	Sample/Tests				SPT
				Depth	Sample		Test	
					Type	No.		
Dark brown topsoil.			0.1(0.1)	1.0				5,7,15,15,15,5 /30
Soft/firm brown sandy gravelly clay.			1.0(0.9)					
Weak light brown/grey mudstone								

Remarks

Logged by

Scale

FIG

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Fax: 01924 450662



Civil Structural Engineering Consultants

Equipment & Methods	Client: 2SH Developments Limited							
	Site: Lindley Moor Road							
WINDOW SAMPLE No. 05	Ground Level						Date: 9.2.2022	
Co-ordinates:								
Description	Reduced Level	Legend	Depth (thick)	Sample/Tests			SPT	
				Depth	Sample			Test
					Type	No.		
Dark brown topsoil.			0.1(0.1)	1.0				4,6,10,12,20,5 /10
Soft/firm brown sandy gravelly clay.			1.0(0.9)					
Moderately strong light brown sandstone								
Remarks								Logged by
								Scale
								FIG

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Fax: 01924 450662



Civil Structural Engineering Consultants

Equipment & Methods	Client: 2SH Developments Limited								
	Site: Lindley Moor Road								
WINDOW SAMPLE No. 06	Ground Level							Date: 9.2.2022	
Co-ordinates:									
Description	Reduced Level	Legend	Depth (thick)	Sample/Tests				SPT	
				Depth	Sample		Test		
					Type	No.			
Dark brown topsoil.			0.1(0.1)	1.0				2,3,4,6,5,6	
Soft/firm brown sandy gravelly clay.			1.0(0.9)						
Firm brown sandy gravelly clay.			2.0(1.0)						
Weak light brown/grey shaley mudstone.				2.0				6,8,11,15,15,9 /20	
Remarks									Logged by
									Scale
									FIG

Tel: 01924 464342
Fax: 01924 450662



Civil Structural Engineering Consultants

Equipment & Methods	Client: 2SH Developments Limited								
	Site: Lindley Moor Road								
WINDOW SAMPLE No. 07	Ground Level							Date: 9.2.2022	
Co-ordinates:									
Description	Reduced Level	Legend	Depth (thick)	Sample/Tests				SPT	
				Depth	Sample		Test		
					Type	No.			
Dark brown topsoil.			0.1(0.1)	1.0				4,5,4,5,5,5	
Soft/firm brown sandy gravelly clay.			1.0(0.9)						
Firm brown sandy clay with small Sandstone gravels and cobbles			1.5(0.5)						
Moderately strong light brown Sandstone.				1.5				10,15,20,30/ 10	
Remarks									
									Logged by
									Scale
FIG									

Tel: 01924 464342
Fax: 01924 450662



Civil Structural Engineering Consultants

Equipment & Methods	Client: 2SH Developments Limited								
	Site: Lindley Moor Road								
WINDOW SAMPLE No. 08	Ground Level							Date: 9.2.2022	
Co-ordinates:									
Description	Reduced Level	Legend	Depth (thick)	Sample/Tests				SPT	
				Depth	Sample		Test		
					Type	No.			
Dark brown topsoil.			0.1(0.1)	1.0				4,4,5,6,6,6	
Soft/firm brown sandy gravelly clay.			1.0(0.9)						
Fractured mudstone.			2.0(1.0)						
Weak light brown/grey mudstone.				2.0				9,10,13,13,15, 9/30	
Remarks									
									Logged by
									Scale
FIG									

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Civil Structural Engineering Consultants

Equipment & Methods	Client: 2SH Developments Limited							
	Site: Lindley Moor Road							
WINDOW SAMPLE No. 09	Ground Level						Date: 9.2.2022	
Co-ordinates:								
Description	Reduced Level	Legend	Depth (thick)	Sample/Tests			SPT	
				Depth	Sample			Test
					Type	No.		
Dark brown topsoil.			0.1(0.1)	1.0				4,4,5,6,6,6
Soft/firm brown sandy gravelly clay.			1.0(0.9)					
Weak grey/brown mudstone			1.5(0.5)					
Remarks								Logged by
								Scale
								FIG

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Civil Structural Engineering Consultants

Equipment & Methods		Client: 2SH Developments Limited						
		Site: Lindley Moor Road						
WINDOW SAMPLE No. 10		Ground Level					Date: 9.2.2022	
Co-ordinates:								
Description	Reduced Level	Legend	Depth (thick)	Sample/Tests				SPT
				Depth	Sample		Test	
					Type	No.		
Dark brown topsoil.			0.1(0.1)					12,12,25,25/ 30
Weathered sandstone			0.5(0.4)					
Remarks								Logged by
								Scale
								FIG

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Civil Structural Engineering Consultants

Equipment & Methods		Client: 2SH Developments Limited						
		Site: Lindley Moor Road						
WINDOW SAMPLE No. 10A		Ground Level					Date: 9.2.2022	
Co-ordinates:								
Description	Reduced Level	Legend	Depth (thick)	Sample/Tests				SPT
				Depth	Sample		Test	
					Type	No.		
Dark brown topsoil.			0.1(0.1)					12,15,30,20/ 20
Weathered Sandstone.			0.6(0.5)					
Solid sandstone.								
Remarks								Logged by
								Scale
								FIG

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Fax: 01924 450662



Civil Structural Engineering Consultants

Equipment & Methods		Client: 2SH Developments Limited						
		Site: Lindley Moor Road						
WINDOW SAMPLE No. 11		Ground Level					Date: 9.2.2022	
Co-ordinates:								
Description	Reduced Level	Legend	Depth (thick)	Sample/Tests				SPT
				Depth	Sample		Test	
					Type	No.		
Dark brown topsoil.			0.1(0.1)					1,1,1,1,1,1 25/30, 50/40
Soft/firm brown sandy clay with Sandstone gravels and cobbles.			1.0(0.9)					
Weathered sandstone.			2.0(1.0)					
Solid sandstone								
Remarks								Logged by
								Scale
								FIG

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Civil Structural Engineering Consultants

Equipment & Methods		Client: 2SH Developments Limited						
		Site: Lindley Moor Road						
WINDOW SAMPLE No. 12		Ground Level					Date: 9.2.2022	
Co-ordinates:								
Description	Reduced Level	Legend	Depth (thick)	Sample/Tests				SPT
				Depth	Sample		Test	
					Type	No.		
Dark brown topsoil.			0.1(0.1)					2,3,4,4,5,5 5,10,11,10,12,12 50/50mm
Soft/firm brown slightly gravelly clay.			1.0(0.9)					
Brown mottled grey clay.			2.0(1.0)					
Sandstone.			2.5(0.5)					
Remarks								Logged by
								Scale
								FIG

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Fax: 01924 450662



Civil Structural Engineering Consultants

Equipment & Methods		Client: 2SH Developments Limited						
		Site: Lindley Moor Road						
WINDOW SAMPLE No. 13		Ground Level					Date: 9.2.2022	
Co-ordinates:								
Description	Reduced Level	Legend	Depth (thick)	Sample/Tests				SPT
				Depth	Sample		Test	
					Type	No.		
Dark brown topsoil.			0.1(0.1)					4,4,5,5,4,4
Soft/firm brown slightly gravelly clay.			1.0(0.9)					
Immature Coal.			2.0(1.0)					
Sandstone								10,12,14,14,14 8/30
Remarks								Logged by
								Scale
								FIG

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Fax: 01924 450662



Civil Structural Engineering Consultants

Equipment & Methods		Client: 2SH Developments Limited						
		Site: Lindley Moor Road						
WINDOW SAMPLE No. 14		Ground Level					Date: 9.2.2022	
Co-ordinates:								
Description	Reduced Level	Legend	Depth (thick)	Sample/Tests				SPT
				Depth	Sample		Test	
					Type	No.		
Dark brown topsoil.			0.1(0.1)					6,6,12,13,13,14
Soft/firm brown very gravelly clay.			1.0(0.9)					
Mudstone.								
Remarks								Logged by
								Scale
								FIG

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Fax: 01924 450662



Civil Structural Engineering Consultants

Equipment & Methods		Client: 2SH Developments Limited						
		Site: Lindley Moor Road						
WINDOW SAMPLE No. 15		Ground Level					Date: 9.2.2022	
Co-ordinates:								
Description	Reduced Level	Legend	Depth (thick)	Sample/Tests				SPT
				Depth	Sample		Test	
					Type	No.		
Dark brown topsoil.			0.1(0.1)					4,4,15,11,12,15,15
Soft/firm brown slightly gravelly clay.			1.0(0.9)					
Mudstone.								
Remarks								Logged by
								Scale
								FIG

STRATIGRAPHY GROUND ENGINEERS

DAILY DRILLING LOG

Site	Lindley Moor, Huddersfield	Date:	08/02/2022
Driller	G Lee	Flush	Air

bh	depth	description		bh	depth	description
1	GL to 0.30	Top Soil				
	0.30 to 1.70	Brown Sandy Clay				
	1.70 to 5.80	Brown Sandstone				
	5.80 to 9.70	Black Shaly Mudstone				
	9.70 to 13.00	Grey Siltstone				
		Water at 1.6m				
		2hr tracking rig up site due to wet/boggy conditions				
		GAS MONITORED				
		O2=20.8%				
		CO2=0%				
		CH4=0%				
		CO=0%				

TODAYS TOTAL _____

PREVIOUS TOTAL _____

TOTAL TO DATE _____

TOTAL CASING _____

STRATIGRAPHY GROUND ENGINEERS

DAILY DRILLING LOG

Site	Lindley Moor, Huddersfield	Date:	09/02/2022
Driller	G Lee	Flush	Air

bh	depth	description		bh	depth	description
1A	GL to 0.30	Topsoil		3	GL to 0.30	Topsoil
	0.30 to 1.70	Brown Sandy Clay			0.30 to 2.20	Brown Sandy Clay
	1.70 to 5.80	Brown Sandstone			2.20 to 9.10	Grey Silty Mudstone
	5.80 to 9.60	Black Shaly Mudstone			9.10 to 11.50	Black Shale/coal traces
	9.60 to 30.00	Grey Siltstone/Sandstone			11.50 to 30.00	Grey Siltstone/Sandstone
		Water at 4.3m				Water at 7.3m
2G	GL to 0.30	Topsoil		4	GL to 0.30	Topsoil
	0.30 to 2.00	Brown Sandy Clay			0.30 to 1.90	Brown Sandy Clay
	2.00 to 3.00	Brown Sandstone			1.90 to 5.30	Brown Sandstone
					5.30 to 24.80	Grey Silty Mudstone
					24.80 to 27.30	Black Shale/coal traces
					27.30 to 30.00	Grey Siltstone/Sandstone
						Water at 8.2m

TODAYS TOTAL _____

PREVIOUS TOTAL _____

TOTAL TO DATE _____

TOTAL CASING _____

STRATIGRAPHY GROUND ENGINEERS

DAILY DRILLING LOG

Site	Lindley Moor, Huddersfield	Date:	09/02/2022
Driller	G Lee	Flush	Air

bh	depth	description		bh	depth	description
5G	GL to 0.30	Topsoil		7	GL to 0.30	Topsoil
	0.30 to 1.90	Brown Sandy Clay			0.30 to 1.60	Brown Sandy Clay
	1.90 to 3.00	Brown Sandstone			1.60 to 5.40	Brown Sandstone
					5.40 to 21.10	Grey Siltstone/Sandstone
6	GL to 0.30	Topsoil			21.10 to 23.50	Black Shale
	0.30 to 1.70	Brown Sandy Clay			23.50 to 30.00	Grey Siltstone/Sandstone
	1.70 to 3.80	Brown Sandstone				Water at 9m
	3.80 to 9.50	Grey Silty Mudstone				
	9.50 to 11.70	Brown Sandstone		8G	GL to 0.30	Topsoil
	11.70 to 18.20	Grey Siltstone/Sandstone			0.30 to 1.90	Brown Sandy Clay
	18.20 to 20.40	Black Shale			1.90 to 3.00	Brown Sandstone
	20.40 to 30.00	Grey Siltstone/Sandstone				
		Water at 1.9m				

TODAYS TOTAL _____

PREVIOUS TOTAL _____

TOTAL TO DATE _____

TOTAL CASING _____

STRATIGRAPHY GROUND ENGINEERS

DAILY DRILLING LOG

Site	Lindley Moor, Huddersfield	Date:	09/02/2022
Driller	G Lee	Flush	Air

bh	depth	description		bh	depth	description
9	GL to 0.30	Topsoil				
	0.30 to 2.30	Brown Sandy Clay				
	2.30 to 3.10	Brown Sandstone				
	3.10 to 7.90	Grey Siltstone/Sandstone				
	7.90 to 11.60	Black Shale				
	11.60 to 30.00	Grey Siltstone/Sandstone				
		Water at 6.3m				
		GAS MONITORED				
		O2=20.8%				
		CO2=0%				
		CH4=0%				
		CO=0%				

TODAYS TOTAL _____

PREVIOUS TOTAL _____

TOTAL TO DATE _____

TOTAL CASING _____

STRATIGRAPHY GROUND ENGINEERS

DAILY DRILLING LOG

Site	Lindley Moor, Huddersfield	Date:	10/02/2022
Driller	G Lee	Flush	Air

bh	depth	description		bh	depth	description
10	GL to 0.30	Topsoil		12	GL to 0.30	Topsoil
	0.30 to 1.70	Brown Sandy Clay			0.30 to 1.20	Brown Sandy Clay
	1.70 to 4.90	Brown Sandstone			1.20 to 4.60	Brown Sandstone
	4.90 to 7.80	Grey Siltstone/Sandstone			4.60 to 23.30	Grey Siltstone/Sandstone
	7.80 to 9.40	Black Shale			23.30 to 26.50	Black Shale
	9.40 to 10.20	Coal			26.50 to 27.30	Coal
	10.20 to 30.00	Grey Siltstone/Sandstone			27.30 to 30.00	Grey Siltstone/Sandstone
		Water at 6.3m				BH Dry
11	GL to 0.30	Topsoil		13 G	GL to 0.30	Topsoil
	0.30 to 1.20	Brown Sandy Clay			0.30 to 1.80	Brown Sandy Clay
	1.20 to 3.60	Brown Sandstone			1.80 to 3.00	Brown Sandstone
	3.60 to 19.20	Grey Siltstone/Sandstone				
	19.20 to 24.00	Black Shale				
	24.00 to 24.80	Coal				
	24.80 to 30.00	Grey Siltstone/Sandstone				

TODAYS TOTAL _____

PREVIOUS TOTAL _____

TOTAL TO DATE _____

TOTAL CASING _____

STRATIGRAPHY GROUND ENGINEERS

DAILY DRILLING LOG

Site	Lindley Moor, Huddersfield	Date:	10/02/2022
Driller	G Lee	Flush	Air

bh	depth	description		bh	depth	description
14	GL to 0.30	Topsoil				
	0.30 to 2.10	Brown Sandy Clay				
	2.10 to 5.30	Brown Sandstone				
	5.30 to 24.10	Grey Siltstone/Sandstone				
	24.10 to 27.00	Black Shale				
	27.00 to 27.70	Coal				
	27.70 to 30.00	Grey Siltstone/Sandstone				
		BH Dry				
15 G	GL to 0.30	Topsoil				
	0.30 to 2.10	Brown Sandy Clay				
	2.10 to 3.00	Brown Sandstone				

TODAYS TOTAL _____

PREVIOUS TOTAL _____

TOTAL TO DATE _____

TOTAL CASING _____

Soil Permeability test

TP01

Site Lindley Moor Road, Lindley

Date

Feb-22 (Test 1)

Client 2SH Developments Ltd

Job No. E20/7768

Pit dimensions m
 Length 2.5
 Width 0.7
 Depth 1.6

Time	Time into Test Mins	Dip Reading mm	Vol cu.m	Vol Change cu.m	Contact area Avge sq.m	Permeability lit/ sq.m/sec
10.01	0	1070	0.92750		5.14200	
10.03	2	1110	0.85750	0.07000	4.88600	0.11634
10.06	5	1150	0.78750	0.07000	4.63000	0.08173
10.11	10	1230	0.64750	0.14000	4.11800	0.10669
10.17	16	1310	0.50750	0.14000	3.60600	0.10070
10.26	25	1410	0.33250	0.17500	2.96600	0.09862
10.35	34	1600	0.00000	0.33250	1.75000	0.26113

BRE Value	0.11536306	lit/ sq.m/sec
-----------	------------	---------------

Average Permeability Value: 0.127535492	lit/ sq.m/sec
---	---------------

Soil Permeability test

TP01

Site Lindley Moor Road, Lindley

Date

Feb-22 (Test 2)

Client 2SH Developments Ltd

Job No. E20/7768

Pit dimensions m
 Length 2.5
 Width 0.7
 Depth 1.6

Time	Time into Test Mins	Dip Reading mm	Vol cu.m	Vol Change cu.m	Contact area Avge sq.m	Permeability lit/ sq.m/sec
14.05	0	1055	0.95375		5.23800	
14.09	4	1110	0.85750	0.09625	4.88600	0.07923
14.23	18	1295	0.53375	0.32375	3.70200	0.08976
14.39	34	1420	0.31500	0.21875	2.90200	0.06901
14.48	43	1600	0.00000	0.31500	1.75000	0.25079

BRE Value	0.08735919	lit/ sq.m/sec
-----------	------------	---------------

Average Permeability Value: 0.122194800	lit/ sq.m/sec
---	---------------

Soil Permeability test

TP05

Site Lindley Moor Road, Lindley

Date

Feb-22 (Test 1)

Client 2SH Developments Ltd

Job No. E20/7768

Pit dimensions m
 Length 2.3
 Width 0.8
 Depth 1.6

Time	Time into Test Mins	Dip Reading mm	Vol cu.m	Vol Change cu.m	Contact area Avge sq.m	Permeability lit/ sq.m/sec
13.09	0	1245	0.65320		4.04100	
13.11	2	1410	0.34960	0.30360	3.01800	0.71682
13.13	4	1600	0.00000	0.34960	1.84000	1.19940

BRE Value	0.93021579	lit/ sq.m/sec
-----------	------------	---------------

Average Permeability Value: 0.958105799	lit/ sq.m/sec
---	---------------

Soil Permeability test

TP05

Site Lindley Moor Road, Lindley

Date

Feb-22 (Test 2)

Client 2SH Developments Ltd

Job No. E20/7768

Pit dimensions m
 Length 2.3
 Width 0.8
 Depth 1.6

Time	Time into Test Mins	Dip Reading mm	Vol cu.m	Vol Change cu.m	Contact area Avge sq.m	Permeability lit/ sq.m/sec
13.44	0	1140	0.84640		4.69200	
13.47	3	1265	0.61640	0.23000	3.91700	0.29685
13.53	9	1450	0.27600	0.34040	2.77000	0.28280
13.58	14	1600	0.00000	0.27600	1.84000	0.39913

BRE Value	0.29157845	lit/ sq.m/sec
-----------	------------	---------------

Average Permeability Value: 0.326261135	lit/ sq.m/sec
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APPENDIX C

Chemical Analysis of Samples

Geotechnical Analysis of Samples



Certificate of Analysis

Certificate Number 22-03146

Issued: 02-Mar-22

Client Haigh Huddleston & Associates Ltd
Firth Buildings
99-101 Leeds Road
Dewsbury
WF12 7BU

Our Reference 22-03146

Client Reference 7768

Order No (not supplied)

Contract Title Lindley Moor Road

Description 13 Soil samples.

Date Received 17-Feb-22

Date Started 17-Feb-22

Date Completed 02-Mar-22

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

A handwritten signature in black ink, appearing to read "K. Bridgewood".

Kirk Bridgewood
General Manager



Summary of Chemical Analysis

Matrix Descriptions

Our Ref 22-03146

Client Ref 7768

Contract Title Lindley Moor Road

Sample ID	Depth	Lab No	Completed	Matrix Description
TP01	0.1	1972217	02/03/2022	Brown sandy CLAY including some rootlets
TP04	0.5	1972218	02/03/2022	Brown sandy CLAY
TP05	0.1	1972219	02/03/2022	Brown gravelly, sandy CLAY including some rootlets
TP06	0.1	1972220	02/03/2022	Brown sandy CLAY including some rootlets
TP07	0.5	1972221	02/03/2022	Brown sandy CLAY
TP08	0.1	1972222	02/03/2022	Brown sandy CLAY including some rootlets
TP09	0.1	1972223	02/03/2022	Brown sandy CLAY including some rootlets
TP11	0.1	1972224	02/03/2022	Brown sandy CLAY including some rootlets
TP12	0.1	1972225	02/03/2022	Brown sandy CLAY including some rootlets
TP13	0.1	1972226	02/03/2022	Brown sandy CLAY including some rootlets
TP14	0.1	1972227	02/03/2022	Brown sandy CLAY including some rootlets
TP15	0.1	1972228	02/03/2022	Brown sandy CLAY including some rootlets
TT17	0.5	1972229	02/03/2022	Brown very gravelly, sandy CLAY

Summary of Chemical Analysis

Soil Samples

Our Ref 22-03146

Client Ref 7768

Contract Title Lindley Moor Road

Lab No	1972217	1972218	1972219	1972220	1972221
Sample ID	TP01	TP04	TP05	TP06	TP07
Depth	0.10	0.50	0.10	0.10	0.50
Other ID					
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	08/02/2022	08/02/2022	08/02/2022	08/02/2022	08/02/2022
Sampling Time	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units					
Metals								
Arsenic	DETSC 2301#	0.2	mg/kg	13	8.7	11	13	4.4
Cadmium	DETSC 2301#	0.1	mg/kg	0.4	< 0.1	0.5	0.4	0.4
Chromium	DETSC 2301#	0.15	mg/kg	15	31	24	24	21
Copper	DETSC 2301#	0.2	mg/kg	29	39	30	27	61
Lead	DETSC 2301#	0.3	mg/kg	150	47	55	55	39
Mercury	DETSC 2325#	0.05	mg/kg	0.12	0.06	0.09	0.09	< 0.05
Nickel	DETSC 2301#	1	mg/kg	11	15	15	14	36
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	1.2	0.8	0.8	0.9
Zinc	DETSC 2301#	1	mg/kg	93	76	120	98	210
Inorganics								
pH	DETSC 2008#		pH	6.3	7.1	5.8	6.1	6.3
Thiocyanate	DETSC 2130#	0.6	mg/kg	3.2	0.7	3.9	3.9	0.9
Total Organic Carbon	DETSC 2084#	0.5	%	6.8	1.2	5.9	5.2	1.6
Sulphide	DETSC 2024*	10	mg/kg	47	35	43	32	< 10
Sulphate as SO ₄ , Total	DETSC 2321#	0.01	%	0.08	0.04	0.08	0.09	0.05
PAHs								
Naphthalene	DETSC 3301	0.1	mg/kg	1.3	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg	2.2	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	DETSC 3301	0.1	mg/kg	1.8	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg	15	< 0.1	< 0.1	< 0.1	< 0.1
Anthracene	DETSC 3301	0.1	mg/kg	2.4	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	DETSC 3301	0.1	mg/kg	16	< 0.1	< 0.1	0.5	< 0.1
Pyrene	DETSC 3301	0.1	mg/kg	14	< 0.1	< 0.1	0.3	< 0.1
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	4.9	< 0.1	< 0.1	< 0.1	< 0.1
Chrysene	DETSC 3301	0.1	mg/kg	5.5	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	3.2	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	1.9	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	4.2	< 0.1	< 0.1	< 0.1	< 0.1
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	2.7	< 0.1	< 0.1	< 0.1	< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	0.6	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	2.3	< 0.1	< 0.1	< 0.1	< 0.1
PAH Total	DETSC 3301	1.6	mg/kg	78	< 1.6	< 1.6	< 1.6	< 1.6
Phenols								
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	0.6	< 0.3	0.5	0.6	< 0.3

Summary of Chemical Analysis

Soil Samples

Our Ref 22-03146

Client Ref 7768

Contract Title Lindley Moor Road

Lab No	1972222	1972223	1972224	1972225	1972226
Sample ID	TP08	TP09	TP11	TP12	TP13
Depth	0.10	0.10	0.10	0.10	0.10
Other ID					
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	08/02/2022	09/02/2022	09/02/2022	09/02/2022	09/02/2022
Sampling Time	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units					
Metals								
Arsenic	DETSC 2301#	0.2	mg/kg	16	19	18	14	20
Cadmium	DETSC 2301#	0.1	mg/kg	0.5	0.6	0.5	0.5	0.6
Chromium	DETSC 2301#	0.15	mg/kg	23	27	33	27	28
Copper	DETSC 2301#	0.2	mg/kg	46	52	63	32	63
Lead	DETSC 2301#	0.3	mg/kg	130	85	530	68	70
Mercury	DETSC 2325#	0.05	mg/kg	0.19	0.21	0.20	0.13	0.20
Nickel	DETSC 2301#	1	mg/kg	12	20	22	18	22
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Zinc	DETSC 2301#	1	mg/kg	310	120	120	110	120
Inorganics								
pH	DETSC 2008#		pH	5.5	6.0	6.0	5.8	5.9
Thiocyanate	DETSC 2130#	0.6	mg/kg	3.3	1.7	2.1	1.9	2.7
Total Organic Carbon	DETSC 2084#	0.5	%	6.6	5.0	9.7	5.2	7.7
Sulphide	DETSC 2024*	10	mg/kg	55	55	43	39	43
Sulphate as SO ₄ , Total	DETSC 2321#	0.01	%	0.09	0.08	0.07	0.06	0.08
PAHs								
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	0.2	< 0.1
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg	0.1	0.1	0.1	0.3	< 0.1
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	0.3	< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg	0.3	0.5	0.4	1.5	0.3
Anthracene	DETSC 3301	0.1	mg/kg	0.1	< 0.1	< 0.1	0.2	0.2
Fluoranthene	DETSC 3301	0.1	mg/kg	0.3	0.6	0.6	1.4	0.9
Pyrene	DETSC 3301	0.1	mg/kg	0.4	0.6	0.6	1.4	0.6
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	0.6	0.5	0.9	0.3
Chrysene	DETSC 3301	0.1	mg/kg	< 0.1	0.4	0.2	0.7	0.4
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	0.3	0.2	0.5	0.2
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	0.2	0.1	0.2	0.2
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	0.3	0.3	0.6	0.4
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	0.3	0.4	0.4
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	0.1	0.2	0.2
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	0.4	0.3	0.2
PAH Total	DETSC 3301	1.6	mg/kg	< 1.6	3.6	4.0	9.1	4.3
Phenols								
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	0.7	0.4	0.4	0.3	0.5

Summary of Chemical Analysis

Soil Samples

Our Ref 22-03146

Client Ref 7768

Contract Title Lindley Moor Road

Lab No	1972227	1972228	1972229
Sample ID	TP14	TP15	TT17
Depth	0.10	0.10	0.50
Other ID			
Sample Type	SOIL	SOIL	SOIL
Sampling Date	09/02/2022	09/02/2022	10/02/2022
Sampling Time	n/s	n/s	n/s

Test	Method	LOD	Units			
Metals						
Arsenic	DETSC 2301#	0.2	mg/kg	9.2	11	3.6
Cadmium	DETSC 2301#	0.1	mg/kg	0.3	0.4	0.4
Chromium	DETSC 2301#	0.15	mg/kg	20	19	25
Copper	DETSC 2301#	0.2	mg/kg	25	30	34
Lead	DETSC 2301#	0.3	mg/kg	46	52	170
Mercury	DETSC 2325#	0.05	mg/kg	0.08	0.11	< 0.05
Nickel	DETSC 2301#	1	mg/kg	13	11	35
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Zinc	DETSC 2301#	1	mg/kg	98	110	390
Inorganics						
pH	DETSC 2008#		pH	5.6	6.0	6.8
Thiocyanate	DETSC 2130#	0.6	mg/kg	3.1	2.7	1.0
Total Organic Carbon	DETSC 2084#	0.5	%	5.6	5.4	< 0.5
Sulphide	DETSC 2024*	10	mg/kg	47	51	43
Sulphate as SO ₄ , Total	DETSC 2321#	0.01	%	0.08	0.07	0.02
PAHs						
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1	0.3	< 0.1
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1	0.4	< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg	0.1	3.2	< 0.1
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1	1.6	< 0.1
Fluoranthene	DETSC 3301	0.1	mg/kg	0.3	6.5	< 0.1
Pyrene	DETSC 3301	0.1	mg/kg	0.3	6.3	< 0.1
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	2.4	< 0.1
Chrysene	DETSC 3301	0.1	mg/kg	< 0.1	2.4	< 0.1
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	1.6	< 0.1
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	1.0	< 0.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	2.2	< 0.1
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	1.4	< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	0.5	< 0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1	1.3	< 0.1
PAH Total	DETSC 3301	1.6	mg/kg	< 1.6	31	< 1.6
Phenols						
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	0.8	0.6	< 0.3

Summary of Asbestos Analysis

Soil Samples

Our Ref 22-03146

Client Ref 7768

Contract Title Lindley Moor Road

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
1972217	TP01 0.10	SOIL	NAD	none	Keith Wilson
1972219	TP05 0.10	SOIL	NAD	none	Keith Wilson
1972220	TP06 0.10	SOIL	NAD	none	Keith Wilson
1972222	TP08 0.10	SOIL	NAD	none	Keith Wilson
1972223	TP09 0.10	SOIL	NAD	none	Keith Wilson
1972224	TP11 0.10	SOIL	NAD	none	Keith Wilson
1972225	TP12 0.10	SOIL	NAD	none	Keith Wilson
1972226	TP13 0.10	SOIL	NAD	none	Keith Wilson
1972227	TP14 0.10	SOIL	NAD	none	Keith Wilson
1972228	TP15 0.10	SOIL	NAD	none	Keith Wilson
1972229	TT17 0.50	SOIL	NAD	none	Keith Wilson

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 22-03146
Client Ref 7768
Contract Lindley Moor Road

Containers Received & Deviating Samples

Lab No	Sample ID	Date		Containers Received	Holding time exceeded for tests	Inappropriate container for tests
		Sampled				
1972217	TP01 0.10 SOIL	08/02/22		GJ 250ml, PT 1L	pH + Conductivity (7 days)	
1972218	TP04 0.50 SOIL	08/02/22		GJ 250ml, PT 1L	pH + Conductivity (7 days)	
1972219	TP05 0.10 SOIL	08/02/22		GJ 250ml, PT 1L	pH + Conductivity (7 days)	
1972220	TP06 0.10 SOIL	08/02/22		GJ 250ml, PT 1L	pH + Conductivity (7 days)	
1972221	TP07 0.50 SOIL	08/02/22		GJ 250ml, PT 1L	pH + Conductivity (7 days)	
1972222	TP08 0.10 SOIL	08/02/22		GJ 250ml, PT 1L	pH + Conductivity (7 days)	
1972223	TP09 0.10 SOIL	09/02/22		GJ 250ml, PT 1L	pH + Conductivity (7 days)	
1972224	TP11 0.10 SOIL	09/02/22		GJ 250ml, PT 1L	pH + Conductivity (7 days)	
1972225	TP12 0.10 SOIL	09/02/22		GJ 250ml, PT 1L	pH + Conductivity (7 days)	
1972226	TP13 0.10 SOIL	09/02/22		GJ 250ml, PT 1L	pH + Conductivity (7 days)	
1972227	TP14 0.10 SOIL	09/02/22		GJ 250ml, PT 1L	pH + Conductivity (7 days)	
1972228	TP15 0.10 SOIL	09/02/22		GJ 250ml, PT 1L	pH + Conductivity (7 days)	
1972229	TT17 0.50 SOIL	10/02/22		GJ 250ml, PT 1L		

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETSC 2002	Organic matter	%	0.1	Air Dried	No	Yes	Yes
DETSC 2003	Loss on ignition	%	0.01	Air Dried	No	Yes	Yes
DETSC 2008	pH	pH Units	1	Air Dried	No	Yes	Yes
DETSC 2024	Sulphide	mg/kg	10	Air Dried	No	Yes	Yes
DETSC 2076	Sulphate Aqueous Extract as SO ₄	mg/l	10	Air Dried	No	Yes	Yes
DETSC 2084	Total Carbon	%	0.5	Air Dried	No	Yes	Yes
DETSC 2084	Total Organic Carbon	%	0.5	Air Dried	No	Yes	Yes
DETSC 2119	Ammoniacal Nitrogen as N	mg/kg	0.5	Air Dried	No	Yes	Yes
DETSC 2130	Cyanide free	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2130	Cyanide total	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2130	Phenol - Monohydric	mg/kg	0.3	Air Dried	No	Yes	Yes
DETSC 2130	Thiocyanate	mg/kg	0.6	Air Dried	No	Yes	Yes
DETSC 2321	Total Sulphate as SO ₄	%	0.01	Air Dried	No	Yes	Yes
DETSC 2325	Mercury	mg/kg	0.05	Air Dried	No	Yes	Yes
DETSC 3049	Sulphur (free)	mg/kg	0.75	Air Dried	No	Yes	Yes
DETSC2123	Boron (water soluble)	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Arsenic	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Barium	mg/kg	1.5	Air Dried	No	Yes	Yes
DETSC2301	Beryllium	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Cadmium Available	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC2301	Cadmium	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC2301	Cobalt	mg/kg	0.7	Air Dried	No	Yes	Yes
DETSC2301	Chromium	mg/kg	0.15	Air Dried	No	Yes	Yes
DETSC2301	Copper	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Manganese	mg/kg	20	Air Dried	No	Yes	Yes
DETSC2301	Molybdenum	mg/kg	0.4	Air Dried	No	Yes	Yes
DETSC2301	Nickel	mg/kg	1	Air Dried	No	Yes	Yes
DETSC2301	Lead	mg/kg	0.3	Air Dried	No	Yes	Yes
DETSC2301	Selenium	mg/kg	0.5	Air Dried	No	Yes	Yes
DETSC2301	Zinc	mg/kg	1	Air Dried	No	Yes	Yes
DETSC 3072	Ali/Aro C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C12	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C12	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C12-C16	mg/kg	1.2	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C12-C16	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C16-C21	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C16-C21	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C12	mg/kg	0.9	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C12	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C12-C16	mg/kg	0.5	As Received	No	Yes	Yes
DETSC 3072	Aromatic C12-C16	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C16-C21	mg/kg	0.6	As Received	No	Yes	Yes
DETSC 3072	Aromatic C16-C21	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETSC 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETS 062	Benzene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Ethylbenzene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Toluene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	m+p Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	o Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3311	C10-C24 Diesel Range Organics (DRO)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3311	C24-C40 Lube Oil Range Organics (LORO)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3311	EPH (C10-C40)	mg/kg	10	As Received	No	Yes	Yes

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETSC 3303	Acenaphthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Acenaphthylene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(a)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(a)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(b)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(k)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(g,h,i)perylene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Dibenzo(a,h)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Indeno(1,2,3-c,d)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Naphthalene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Phenanthrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3401	PCB 28 + PCB 31	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 52	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 101	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 118	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 153	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 138	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 180	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB Total	mg/kg	0.01	As Received	No	Yes	Yes

Method details are shown only for those determinands listed in Annex A of the MCERTS standard. Anything not included on this list falls outside the scope of MCERTS. No Recovery Factors are used in the determination of results. Results reported assume 100% recovery. Full method statements are available on request.

End of Report



STRUCTURAL SOILS LTD
TEST REPORT



Report No. 785149 R1

1774

Date 21-February-2022 Contract Lindley Moor road

Client Haigh Huddleston Associates
Address Firth Building
99-101 Leeds Road
Dewsbury
WF12 7BU

For the Attention of Martin Huddleston

Samples submitted by client 14/02/2022
Testing Started 15/02/2022
Testing Completed 21/02/2022

Client Reference
Client Order No.
Instruction Type Written

Tests marked 'Not UKAS Accredited' in this report are not included in the UKAS Accreditation Schedule for our Laboratory.

UKAS Accredited Tests Undertaken

Moisture Content (oven drying method) BS1377:Part 2:1990,clause 3.2 (superseded)**
Liquid Limit (definitive method) BS1377:Part 2:1990,clause 4.3
Liquid Limit (one point method) BS1377:Part 2:1990,clause 4.4
Plastic Limit BS1377:Part 2:1990,clause 5.3
Plasticity Index Derivation BS1377:Part 2:1990,clause 5.4

* This clause of BS1377 is no longer the most up to date method due to the publication of ISO17892

Please Note: Remaining samples will be retained for a period of one month from today and will then be disposed of.

Test were undertaken on samples 'as received' unless otherwise stated.

Opinions and interpretations expressed in this report are outside the scope of accreditation for this laboratory.

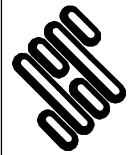
Structural Soils Ltd, The Potteries, Pottery Street, Castleford, WF10 1NJ Tel.01977 552255. E-mail mark.athorne@soils.co.uk

SUMMARY OF SOIL CLASSIFICATION TESTS

In accordance with Part 1,Part 12 of BS EN ISO 17892

Exploratory Position ID	Sample Ref	Sample Type	Depth (m)	Water Content %	Liquid Limit %	Plastic Limit %	Plasticity Index	% <425um	Description of Sample
TP02		D	0.40	21.8	54	36	18	32	Brown slightly gravelly TOP SOIL
TP06		D	0.50	26.9	42	25	17	53	Brown slightly sandy slightly silty slightly gravelly CLAY
TP08		D	0.50	27.8	41	24	17	88	Grey brown slightly sandy slightly gravelly CLAY

SYMBOLS: * denotes BS 1377



STRUCTURAL
SOILS LTD

Contract:

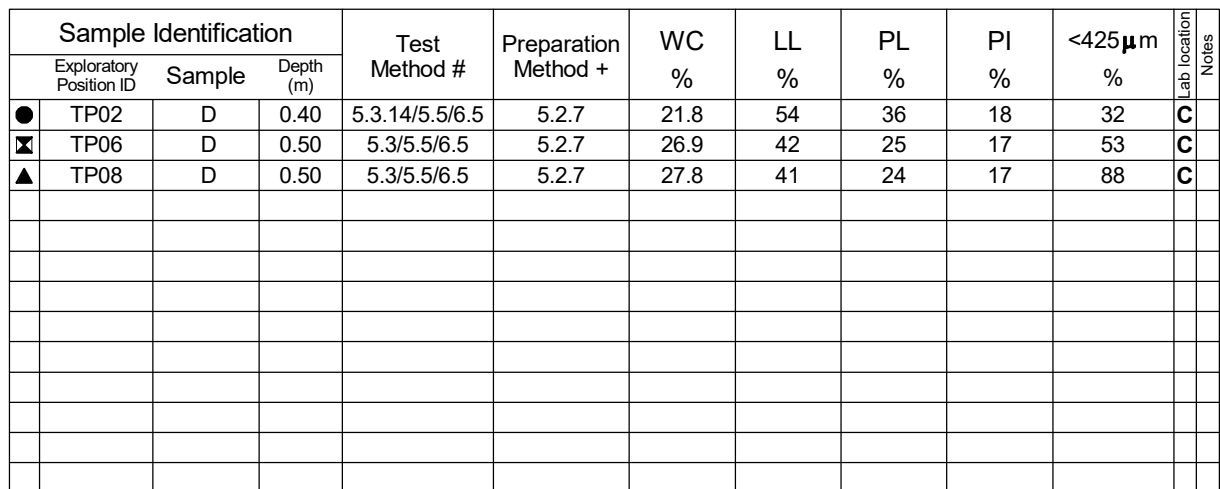
Lindley Moor Road

Contract Ref:

785149



According to BS EN 14688-2:2018
Testing in accordance with BS EN ISO 17892-12:2018+A1:2021



Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NJ), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)



STRUCTURAL SOILS
The Potteries
Pottery Street
Castleford
W. Yorkshire WF10 1NJ

Compiled By

Date _____

LORNA WHITWORTH

21/02/22

Contract

Lindley Moor Road

Contract Ref:

785149



TESTING VERIFICATION CERTIFICATE



1774

The test results included in this report are certified as:-

ISSUE STATUS: **FINAL**

In accordance with the Structural Soils Ltd Laboratory Quality Management System, results sheets and summaries of results issued by the laboratory are checked by an approved signatory. The integrity of the test data and results are ensured by control of the computer system employed by the laboratory as part of the Software Verification Program as detailed in the Laboratory Quality Manual.

This testing verification certificate covers all testing compiled on or before the following datetime: **21/02/2022 13:06:30**.

Testing reported after this date is not covered by this Verification Certificate.

Approved Signatory
Luke Fisher (Laboratory Manager)

(Head Office)
Bristol Laboratory
Unit 1A, Princess Street
Bedminster
Bristol
BS3 4AG

Castleford Laboratory
The Potteries, Pottery Street
Castleford
West Yorkshire
WF10 1NJ

Hemel Laboratory
18 Frogmore Road
Hemel Hempstead
Hertfordshire
HP3 9RT

Tonbridge Laboratory
Anerley Court, Half Moon Lane
Hildenborough
Tonbridge
TN11 9HU



**STRUCTURAL
SOILS LTD**

Contract:

Lindley Moor Road

Job No:

785149



APPENDIX D

Coal Authority Report



The Coal
Authority

CON29M

coal mining report

LINDLEY MOOR ROAD, LINDLEY MOOR, HUDDERSFIELD, KIRKLEES, HD3 3TB



Known or potential coal mining risks

Past underground coal mining	Page 4
Future underground coal mining	Page 4
Mine entries	Page 5



Further action

No further reports from the Coal Authority are required. Further information on any next steps can be found in our Professional opinion.

For more information on our reports please visit
www.groundstability.com



Professional opinion

According to the official mining information records held by the Coal Authority at the time of this search, evidence of, or the potential for, coal mining related features have been identified. In view of the coal mining circumstances we would recommend that any planned or future development should follow detailed technical advice before beginning work on site. Please see **page 3** for further details on **Future development**.

Your reference: **MWA 7768**
Our reference: **51002634543001**
Date: **27 August 2021**

Client name:
**HAIGH HUDDLESTON &
ASSOCIATES**

If you require any further assistance please
contact our experts on:
0345 762 6848
groundstability@coal.gov.uk

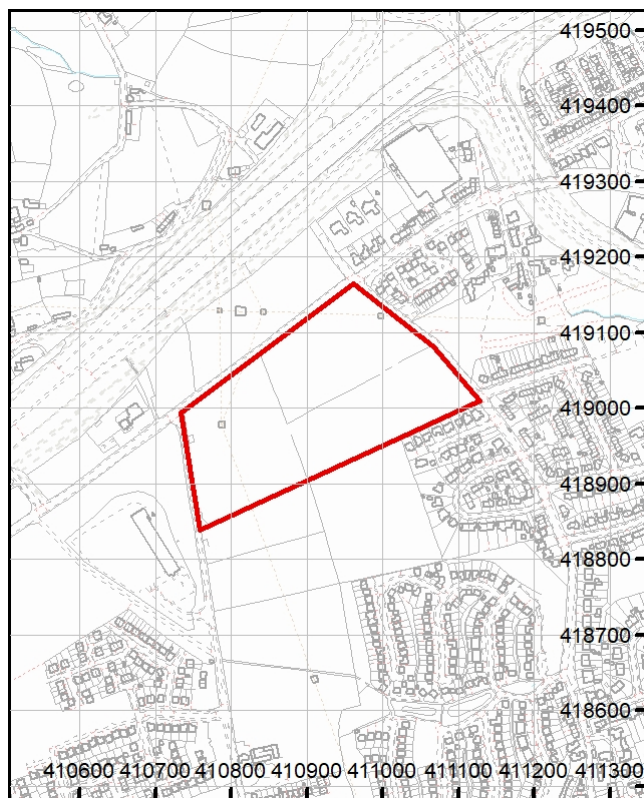


The Law
Society

Enquiry boundary

Key

Approximate position of enquiry boundary shown



We can confirm that the location is
on the coalfield



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Ordnance Survey Licence number: 100020315.

This report is prepared in accordance with the latest Law Society's Guidance Notes 2018, the User Guide 2018 and the Coal Authority's Terms and Conditions applicable at the time the report was produced.



Accessibility

If you would like this information in an alternative format, please contact our communications team on 0345 762 6848 or email communications@coal.gov.uk.

Professional opinion



Future development

If development proposals are being considered, technical advice relating to both the investigation of coal and former coal mines and their treatment should be obtained before beginning work on site. All proposals should apply specialist engineering practice required for former mining areas. No development should be undertaken that intersects, disturbs or interferes with any coal or coal mines without first obtaining the permission of the Coal Authority. Developers should be aware that the investigation of coal seams, mine workings or mine entries may have the potential to generate and/or displace underground gases. Associated risks both to the development site and any neighbouring land or properties should be fully considered when undertaking any ground works. The need for effective measures to prevent gases migrating onto any land or into any properties, either during investigation or remediation work, or after development must also be assessed and properly addressed.

If you are looking to develop, or undertake works, within a coal mining development high risk area your Local Authority planning department may require a Coal Mining Risk Assessment to be undertaken by a qualified mining geologist or engineer. Should you require any additional information then please contact the Coal Authority on **0345 762 6848** or email **cmra@coal.gov.uk**.

Detailed findings

Information provided by the Coal Authority in this report is compiled in response to the Law Society's CON29M Coal Mining enquiries. The said enquiries are protected by copyright owned by the Law Society of 113 Chancery Lane, London WC2A 1PL.

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1 Past underground coal mining

The property is in a surface area that could be affected by underground mining in 1 seam of coal at 80m to 90m depth, and last worked in 1857.

Any movement in the ground due to coal mining activity associated with these workings should have stopped by now.

In addition the property is in an area where the Coal Authority believes there is coal at or close to the surface. This coal may have been worked at some time in the past. The potential presence of coal workings at or close to the surface should be considered, particularly prior to any site works or future development activity, as ground movement could still be a risk. Your attention is drawn to the Professional opinion sections of the report.

2 Present underground coal mining

The property is not within a surface area that could be affected by present underground mining.

3 Future underground coal mining

The property is not in an area where the Coal Authority has received an application for, and is currently considering whether to grant a licence to remove or work coal by underground methods.

The property is not in an area where a licence has been granted to remove or otherwise work coal using underground methods.

The property is not in an area likely to be affected from any planned future underground coal mining.

However, reserves of coal exist in the local area which could be worked at some time in the future.

No notices have been given, under section 46 of the Coal Mining Subsidence Act 1991, stating that the land is at risk of subsidence.

4 Mine entries

There are no recorded coal mine entries known to the Coal Authority within, or within 20 metres, of the boundary of the property.

This information is based on the information that the Coal Authority has at the time of this enquiry.

Based on the Coal Authority's knowledge of the mining circumstances at the time of this enquiry, there may be unrecorded mine entries in the local area that do not appear on Coal Authority records.

5 Coal mining geology

The Coal Authority is not aware of any damage due to geological faults or other lines of weakness that have been affected by coal mining.

6 Past opencast coal mining

The property is not within the boundary of an opencast site from which coal has been removed by opencast methods.

7 Present opencast coal mining

The property does not lie within 200 metres of the boundary of an opencast site from which coal is being removed by opencast methods.

8 Future opencast coal mining

There are no licence requests outstanding to remove coal by opencast methods within 800 metres of the boundary.

The property is not within 800 metres of the boundary of an opencast site for which a licence to remove coal by opencast methods has been granted.

9 Coal mining subsidence

The Coal Authority has not received a damage notice or claim for the subject property, or any property within 50 metres of the enquiry boundary, since 31 October 1994.

There is no current Stop Notice delaying the start of remedial works or repairs to the property.

The Coal Authority is not aware of any request having been made to carry out preventive works before coal is worked under section 33 of the Coal Mining Subsidence Act 1991.

10 Mine gas

The Coal Authority has no record of a mine gas emission requiring action.

11 Hazards related to coal mining

The property has not been subject to remedial works, by or on behalf of the Coal Authority, under its Emergency Surface Hazard Call Out procedures.

12 Withdrawal of support

The property is not in an area where a notice to withdraw support has been given.

The property is not in an area where a notice has been given under section 41 of the Coal Industry Act 1994, cancelling the entitlement to withdraw support.

13 Working facilities order

The property is not in an area where an order has been made, under the provisions of the Mines (Working Facilities and Support) Acts 1923 and 1966 or any statutory modification or amendment thereof.

14 Payments to owners of former copyhold land

The property is not in an area where a relevant notice has been published under the Coal Industry Act 1975/Coal Industry Act 1994.

Statutory cover



Coal mining subsidence

In the unlikely event of any coal mining related subsidence damage, the Coal Authority or the mine operator has a duty to take remedial action in respect of subsidence caused by the withdrawal of support from land or property in connection with lawful coal mining operations.

When the works are the responsibility of the Coal Authority, our dedicated public safety and subsidence team will manage the claim. The house or land owner ("the owner") is covered for these works under the terms of the Coal Mining Subsidence Act 1991 (as amended by the Coal Industry Act 1994). Please note, this Act does not apply where coal was worked or gotten by virtue of the grant of a gale in the Forest of Dean, or any other part of the Hundred of St. Briavels in the county of Gloucester.

If you believe your land or property is suffering from coal mining subsidence damage and you need more information on what to do next, please use the following link to our website which sets out what your rights are and what you need to consider before making a claim.

www.gov.uk/government/publications/coal-mining-subsidence-damage-notice-form



Coal mining hazards

Our public safety and subsidence team provide a 24 hour a day, 7 days a week hazard reporting service, to help protect the public from hazards caused by past coal workings, such as a mine shaft or shallow working collapse. To report any hazards please call **01623 646 333**. Further information can be found on our website: www.gov.uk/coalauthority.

Glossary



Key terms

adit - horizontal or sloped entrance to a mine

coal mining subsidence - ground movement caused by the removal of coal by underground mining

Coal Mining Subsidence Act 1991 - the Act setting out the duties of the Coal Authority to repair damage caused by coal mining subsidence

coal mining subsidence damage - damage to land, buildings or structures caused by the removal of coal by underground mining

coal seams - bed of coal of varying thickness

future opencast coal mining - a licence granted, or licence application received, by the Coal Authority to excavate coal from the surface

future underground coal mining - a licence granted, or licence application received, by the Coal Authority to excavate coal underground. Although it is unlikely, remaining coal reserves could create a possibility for future mining, which would be licensed by the Coal Authority

mine entries - collective name for shafts and adits

payments to owners of former copyhold land - historically, copyhold land gave rights to coal to the copyholder. Legislation was set up to allow others to work this coal, but they had to issue a notice and pay compensation if a copyholder came forward

shaft - vertical entry into a mine

site investigation - investigations of coal mining risks carried out with the Coal Authority's permission

stop notice - a delay to repairs because further coal mining subsidence damage may occur and it would be unwise to carry out permanent repairs

subsidence claim - a formal notice of subsidence damage to the Coal Authority since it was established on 31 October 1994

withdrawal of support - a historic notice informing landowners that the coal beneath their property was going to be worked

working facilities orders - a court order which gave permission, restricted or prevented coal mine workings

APPENDIX E

Groundsure Report

Historical Plans

LAND AT LINDLEY MOOR ROAD, LINDLEY, HUDDERSFIELD, HD3 3TB

Order Details

Date: 31/08/2021
Your ref: MWA_7768
Our Ref: GS-8157480
Client: Haigh Huddleston & Associates

Site Details

Location: 410924 419016
Area: 6.33 ha
Authority: [Kirklees Council](#)



Summary of findings

p. 2

Aerial image

p. 8

OS MasterMap site plan

p.12

groundsure.com/insightuserguide

Contact us with any questions at:

info@groundsure.com

08444 159 000

Summary of findings

Page	Section	Past land use	On site	0-50m	50-250m	250-500m	500-2000m
13	1.1	Historical industrial land uses	0	2	10	18	-
15	1.2	Historical tanks	0	0	1	1	-
15	1.3	Historical energy features	0	0	2	3	-
16	1.4	Historical petrol stations	0	0	0	0	-
16	1.5	Historical garages	0	2	0	1	-
16	1.6	Historical military land	0	0	0	0	-
Page	Section	Past land use - un-grouped	On site	0-50m	50-250m	250-500m	500-2000m
17	2.1	Historical industrial land uses	0	3	18	23	-
19	2.2	Historical tanks	0	0	2	1	-
20	2.3	Historical energy features	0	0	3	6	-
20	2.4	Historical petrol stations	0	0	0	0	-
20	2.5	Historical garages	0	4	0	2	-
Page	Section	Waste and landfill	On site	0-50m	50-250m	250-500m	500-2000m
22	3.1	Active or recent landfill	0	0	0	0	-
22	3.2	Historical landfill (BGS records)	0	0	0	0	-
23	3.3	Historical landfill (LA/mapping records)	0	0	0	1	-
23	3.4	Historical landfill (EA/NRW records)	0	0	0	0	-
23	3.5	Historical waste sites	0	0	0	0	-
23	3.6	Licensed waste sites	0	0	0	0	-
23	3.7	Waste exemptions	0	0	0	8	-
Page	Section	Current industrial land use	On site	0-50m	50-250m	250-500m	500-2000m
25	4.1	Recent industrial land uses	2	2	14	-	-
27	4.2	Current or recent petrol stations	0	0	0	0	-
27	4.3	Electricity cables	0	0	0	0	-
27	4.4	Gas pipelines	0	0	0	0	-
27	4.5	Sites determined as Contaminated Land	0	0	0	0	-



27	4.6	Control of Major Accident Hazards (COMAH)	0	0	0	0	-
28	4.7	Regulated explosive sites	0	0	0	0	-
28	4.8	Hazardous substance storage/usage	0	0	0	0	-
28	4.9	Historical licensed industrial activities (IPC)	0	0	0	0	-
28	4.10	Licensed industrial activities (Part A(1))	0	0	0	0	-
28	4.11	Licensed pollutant release (Part A(2)/B)	0	0	0	0	-
29	4.12	Radioactive Substance Authorisations	0	0	0	0	-
29	4.13	<u>Licensed Discharges to controlled waters</u>	0	0	4	2	-
30	4.14	Pollutant release to surface waters (Red List)	0	0	0	0	-
30	4.15	Pollutant release to public sewer	0	0	0	0	-
30	4.16	List 1 Dangerous Substances	0	0	0	0	-
31	4.17	List 2 Dangerous Substances	0	0	0	0	-
31	4.18	<u>Pollution Incidents (EA/NRW)</u>	0	0	1	7	-
32	4.19	Pollution inventory substances	0	0	0	0	-
32	4.20	Pollution inventory waste transfers	0	0	0	0	-
32	4.21	Pollution inventory radioactive waste	0	0	0	0	-
Page	Section	Hydrogeology	On site	0-50m	50-250m	250-500m	500-2000m
33	5.1	Superficial aquifer	None (within 500m)				
34	5.2	<u>Bedrock aquifer</u>	Identified (within 500m)				
35	5.3	<u>Groundwater vulnerability</u>	Identified (within 50m)				
36	5.4	Groundwater vulnerability- soluble rock risk	None (within 0m)				
36	5.5	Groundwater vulnerability- local information	None (within 0m)				
37	5.6	<u>Groundwater abstractions</u>	0	0	0	2	12
41	5.7	<u>Surface water abstractions</u>	0	0	0	0	4
42	5.8	Potable abstractions	0	0	0	0	0
42	5.9	<u>Source Protection Zones</u>	0	0	0	1	-
42	5.10	Source Protection Zones (confined aquifer)	0	0	0	0	-
Page	Section	Hydrology	On site	0-50m	50-250m	250-500m	500-2000m
43	6.1	<u>Water Network (OS MasterMap)</u>	0	0	2	-	-



44	6.2	<u>Surface water features</u>	0	0	2	-	-
44	6.3	<u>WFD Surface water body catchments</u>	1	-	-	-	-
44	6.4	<u>WFD Surface water bodies</u>	0	0	0	-	-
45	6.5	<u>WFD Groundwater bodies</u>	1	-	-	-	-
Page	Section	River and coastal flooding	On site	0-50m	50-250m	250-500m	500-2000m
46	7.1	Risk of Flooding from Rivers and Sea (RoFRaS)	None (within 50m)				
46	7.2	Historical Flood Events	0	0	0	-	-
46	7.3	Flood Defences	0	0	0	-	-
46	7.4	Areas Benefiting from Flood Defences	0	0	0	-	-
47	7.5	Flood Storage Areas	0	0	0	-	-
48	7.6	Flood Zone 2	None (within 50m)				
48	7.7	Flood Zone 3	None (within 50m)				
Page	Section	Surface water flooding					
49	8.1	Surface water flooding	Negligible (within 50m)				
Page	Section	Groundwater flooding					
50	9.1	<u>Groundwater flooding</u>	Negligible (within 50m)				
Page	Section	Environmental designations	On site	0-50m	50-250m	250-500m	500-2000m
51	10.1	<u>Sites of Special Scientific Interest (SSSI)</u>	0	0	0	0	1
52	10.2	Conserved wetland sites (Ramsar sites)	0	0	0	0	0
52	10.3	Special Areas of Conservation (SAC)	0	0	0	0	0
52	10.4	Special Protection Areas (SPA)	0	0	0	0	0
52	10.5	National Nature Reserves (NNR)	0	0	0	0	0
53	10.6	Local Nature Reserves (LNR)	0	0	0	0	0
53	10.7	<u>Designated Ancient Woodland</u>	0	0	0	0	4
53	10.8	Biosphere Reserves	0	0	0	0	0
54	10.9	Forest Parks	0	0	0	0	0
54	10.10	Marine Conservation Zones	0	0	0	0	0
54	10.11	<u>Green Belt</u>	0	1	1	0	1
54	10.12	Proposed Ramsar sites	0	0	0	0	0



55	10.13	Possible Special Areas of Conservation (pSAC)	0	0	0	0	0
55	10.14	Potential Special Protection Areas (pSPA)	0	0	0	0	0
55	10.15	Nitrate Sensitive Areas	0	0	0	0	0
55	10.16	Nitrate Vulnerable Zones	0	0	0	0	0
56	<u>10.17</u>	<u>SSSI Impact Risk Zones</u>	1	-	-	-	-
57	<u>10.18</u>	<u>SSSI Units</u>	0	0	0	0	1
Page	Section	Visual and cultural designations	On site	0-50m	50-250m	250-500m	500-2000m
58	11.1	World Heritage Sites	0	0	0	-	-
59	11.2	Area of Outstanding Natural Beauty	0	0	0	-	-
59	11.3	National Parks	0	0	0	-	-
59	<u>11.4</u>	<u>Listed Buildings</u>	0	2	5	-	-
60	11.5	Conservation Areas	0	0	0	-	-
60	11.6	Scheduled Ancient Monuments	0	0	0	-	-
60	11.7	Registered Parks and Gardens	0	0	0	-	-
Page	Section	Agricultural designations	On site	0-50m	50-250m	250-500m	500-2000m
61	<u>12.1</u>	<u>Agricultural Land Classification</u>	Grade 3b (within 250m)				
62	12.2	Open Access Land	0	0	0	-	-
63	<u>12.3</u>	<u>Tree Felling Licences</u>	0	0	26	-	-
64	12.4	Environmental Stewardship Schemes	0	0	0	-	-
64	<u>12.5</u>	<u>Countryside Stewardship Schemes</u>	0	0	1	-	-
Page	Section	Habitat designations	On site	0-50m	50-250m	250-500m	500-2000m
65	<u>13.1</u>	<u>Priority Habitat Inventory</u>	0	0	3	-	-
66	13.2	Habitat Networks	0	0	0	-	-
66	13.3	Open Mosaic Habitat	0	0	0	-	-
66	13.4	Limestone Pavement Orders	0	0	0	-	-
Page	Section	Geology 1:10,000 scale	On site	0-50m	50-250m	250-500m	500-2000m
67	<u>14.1</u>	<u>10k Availability</u>	Identified (within 500m)				
68	<u>14.2</u>	<u>Artificial and made ground (10k)</u>	0	0	2	7	-
70	14.3	Superficial geology (10k)	0	0	0	0	-

70	14.4	Landslip (10k)	0	0	0	0	-
71	14.5	<u>Bedrock geology (10k)</u>	7	2	7	24	-
73	14.6	<u>Bedrock faults and other linear features (10k)</u>	2	1	3	15	-
Page	Section	Geology 1:50,000 scale	On site	0-50m	50-250m	250-500m	500-2000m
75	15.1	<u>50k Availability</u>	Identified (within 500m)				
76	15.2	<u>Artificial and made ground (50k)</u>	0	0	0	1	-
77	15.3	Artificial ground permeability (50k)	0	0	-	-	-
78	15.4	Superficial geology (50k)	0	0	0	0	-
78	15.5	Superficial permeability (50k)	None (within 50m)				
78	15.6	Landslip (50k)	0	0	0	0	-
78	15.7	Landslip permeability (50k)	None (within 50m)				
79	15.8	<u>Bedrock geology (50k)</u>	7	1	8	24	-
81	15.9	<u>Bedrock permeability (50k)</u>	Identified (within 50m)				
82	15.10	<u>Bedrock faults and other linear features (50k)</u>	2	1	3	14	-
Page	Section	Boreholes	On site	0-50m	50-250m	250-500m	500-2000m
84	16.1	<u>BGS Boreholes</u>	0	0	16	-	-
Page	Section	Natural ground subsidence					
86	17.1	<u>Shrink swell clays</u>	Very low (within 50m)				
87	17.2	<u>Running sands</u>	Negligible (within 50m)				
88	17.3	<u>Compressible deposits</u>	Negligible (within 50m)				
89	17.4	<u>Collapsible deposits</u>	Very low (within 50m)				
90	17.5	<u>Landslides</u>	Low (within 50m)				
92	17.6	<u>Ground dissolution of soluble rocks</u>	Negligible (within 50m)				
Page	Section	Mining, ground workings and natural cavities	On site	0-50m	50-250m	250-500m	500-2000m
93	18.1	Natural cavities	0	0	0	0	-
94	18.2	<u>BritPits</u>	0	0	0	4	-
95	18.3	<u>Surface ground workings</u>	0	1	16	-	-
95	18.4	<u>Underground workings</u>	0	0	0	0	17
96	18.5	<u>Historical Mineral Planning Areas</u>	1	0	0	1	-



<u>97</u>	<u>18.6</u>	<u>Non-coal mining</u>	1	0	1	1	8
<u>98</u>	<u>18.7</u>	<u>Mining cavities</u>	0	0	0	0	4
99	18.8	JPB mining areas	None (within 0m)				
<u>99</u>	<u>18.9</u>	<u>Coal mining</u>	Identified (within 0m)				
99	18.10	Brine areas	None (within 0m)				
99	18.11	Gypsum areas	None (within 0m)				
100	18.12	Tin mining	None (within 0m)				
100	18.13	Clay mining	None (within 0m)				
Page	Section	Radon					
<u>101</u>	<u>19.1</u>	<u>Radon</u>	Less than 1% (within 0m)				
Page	Section	Soil chemistry	On site	0-50m	50-250m	250-500m	500-2000m
<u>102</u>	<u>20.1</u>	<u>BGS Estimated Background Soil Chemistry</u>	15	3	-	-	-
103	20.2	BGS Estimated Urban Soil Chemistry	0	0	-	-	-
103	20.3	BGS Measured Urban Soil Chemistry	0	0	-	-	-
Page	Section	Railway infrastructure and projects	On site	0-50m	50-250m	250-500m	500-2000m
104	21.1	Underground railways (London)	0	0	0	-	-
104	21.2	Underground railways (Non-London)	0	0	0	-	-
104	21.3	Railway tunnels	0	0	0	-	-
104	21.4	Historical railway and tunnel features	0	0	0	-	-
104	21.5	Royal Mail tunnels	0	0	0	-	-
105	21.6	Historical railways	0	0	0	-	-
105	21.7	Railways	0	0	0	-	-
105	21.8	Crossrail 1	0	0	0	0	-
105	21.9	Crossrail 2	0	0	0	0	-
105	21.10	HS2	0	0	0	0	-

Recent aerial photograph



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Capture Date: 01/07/2018

Site Area: 6.33ha



Recent site history - 2012 aerial photograph



Capture Date: 26/03/2012

Site Area: 6.33ha



Recent site history - 2000 aerial photograph



Capture Date: 25/08/2000

Site Area: 6.33ha



Recent site history - 1999 aerial photograph



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Capture Date: 05/09/1999

Site Area: 6.33ha



OS MasterMap site plan



Site Area: 6.33ha



1 Past land use



1.1 Historical industrial land uses

Records within 500m

30

Potentially contaminative land use features digitised from historical Ordnance Survey mapping at 1:10,000 and 1:10,560 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on **page 13**

ID	Location	Land use	Dates present	Group ID
1	17m NE	Cuttings	1892	1409766

ID	Location	Land use	Dates present	Group ID
A	39m W	Garage	1975 - 1985	1542639
3	91m NW	Cuttings	1975 - 1985	1554736
B	140m NE	Unspecified Works	1975 - 1985	1531521
5	203m N	Cuttings	1975 - 1985	1543183
6	207m NE	Cuttings	1975 - 1985	1477860
7	213m N	Unspecified Pit	1891	1452368
8	222m NE	Cuttings	1975 - 1985	1492742
C	228m W	Unspecified Quarry	1948 - 1956	1475231
D	230m NE	Cuttings	1975 - 1985	1477396
C	237m W	Cuttings	1930	1409758
C	242m W	Cuttings	1975 - 1985	1463706
F	278m SE	Unspecified Heap	1966 - 1975	1517132
F	279m SE	Unspecified Heap	1985	1504318
C	283m W	Unspecified Pit	1905 - 1930	1528961
E	290m NE	Unspecified Depot	1975 - 1985	1542774
C	300m W	Unspecified Quarry	1930	1524895
F	311m SE	Unspecified Ground Workings	1948	1412119
10	345m NE	Cuttings	1975 - 1985	1465643
12	380m NE	Cuttings	1975 - 1985	1463895
G	458m SE	Disused Brewery	1938 - 1948	1529781
G	458m SE	Disused Brewery	1905	1532923
H	471m W	Unspecified Heap	1891	1415057
I	474m W	Brewery	1948	1535761
I	484m W	Brewery	1892	1554551
I	491m W	Unspecified Works	1966	1438153
I	496m W	Brewery	1905	1525420
H	496m W	Unspecified Quarry	1891	1426672
I	496m W	Brewery	1956	1552944



ID	Location	Land use	Dates present	Group ID
I	498m W	Brewery	1930	1547741

This data is sourced from Ordnance Survey / Groundsure.

1.2 Historical tanks

Records within 500m

2

Tank features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original ungrouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on **page 13**

ID	Location	Land use	Dates present	Group ID
4	156m N	Unspecified Tank	1973 - 1991	249658
11	367m W	Unspecified Tank	1893	222959

This data is sourced from Ordnance Survey / Groundsure.

1.3 Historical energy features

Records within 500m

5

Energy features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original ungrouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on **page 13**

ID	Location	Land use	Dates present	Group ID
2	69m SE	Electricity Substation	1972 - 1986	135655
B	229m NE	Electricity Substation	1973	128910
D	284m NE	Electricity Substation	1973 - 1991	143350
9	319m E	Electricity Substation	1972 - 1986	143505
13	421m SE	Electricity Substation	1972 - 1986	137638



This data is sourced from Ordnance Survey / Groundsure.

1.4 Historical petrol stations

Records within 500m

0

Petrol stations digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original ungrouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

This data is sourced from Ordnance Survey / Groundsure.

1.5 Historical garages

Records within 500m

3

Garages digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original ungrouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on **page 13**

ID	Location	Land use	Dates present	Group ID
A	38m W	Garage	1961 - 1987	46869
A	39m W	Garage	1978 - 1993	44904
E	266m NE	Maintenance Depot	1973 - 1991	45820

This data is sourced from Ordnance Survey / Groundsure.

1.6 Historical military land

Records within 500m

0

Areas of military land digitised from multiple sources including the National Archives, local records, MOD records and verified other sources, intelligently grouped into contiguous features.

This data is sourced from Ordnance Survey / Groundsure / other sources.



2 Past land use - un-grouped



2.1 Historical industrial land uses

Records within 500m

44

Potentially contaminative land use features digitised from historical Ordnance Survey mapping at 1:10,000 and 10,560 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on **page 17**

ID	Location	Land Use	Date	Group ID
1	17m NE	Cuttings	1892	1409766
A	39m W	Garage	1975	1542639
A	39m W	Garage	1985	1542639

ID	Location	Land Use	Date	Group ID
C	91m NW	Cuttings	1975	1554736
C	91m NW	Cuttings	1985	1554736
D	140m NE	Unspecified Works	1975	1531521
D	140m NE	Unspecified Works	1985	1531521
F	203m N	Cuttings	1975	1543183
F	203m N	Cuttings	1985	1543183
G	207m NE	Cuttings	1975	1477860
G	207m NE	Cuttings	1985	1477860
2	213m N	Unspecified Pit	1891	1452368
H	222m NE	Cuttings	1975	1492742
H	222m NE	Cuttings	1985	1492742
I	228m W	Unspecified Quarry	1956	1475231
J	230m NE	Cuttings	1975	1477396
J	230m NE	Cuttings	1985	1477396
I	231m W	Unspecified Quarry	1948	1475231
I	237m W	Cuttings	1930	1409758
I	242m W	Cuttings	1975	1463706
I	242m W	Cuttings	1985	1463706
L	278m SE	Unspecified Heap	1975	1517132
L	278m SE	Unspecified Heap	1966	1517132
L	279m SE	Unspecified Heap	1985	1504318
I	283m W	Unspecified Pit	1905	1528961
I	283m W	Unspecified Pit	1930	1528961
K	290m NE	Unspecified Depot	1975	1542774
K	290m NE	Unspecified Depot	1985	1542774
I	300m W	Unspecified Quarry	1930	1524895
L	311m SE	Unspecified Ground Workings	1948	1412119
N	345m NE	Cuttings	1975	1465643



ID	Location	Land Use	Date	Group ID
N	345m NE	Cuttings	1985	1465643
O	380m NE	Cuttings	1975	1463895
O	380m NE	Cuttings	1985	1463895
Q	458m SE	Disused Brewery	1948	1529781
Q	458m SE	Disused Brewery	1905	1532923
R	471m W	Unspecified Heap	1891	1415057
S	474m W	Brewery	1948	1535761
S	484m W	Brewery	1892	1554551
S	491m W	Unspecified Works	1966	1438153
S	496m W	Brewery	1905	1525420
R	496m W	Unspecified Quarry	1891	1426672
S	496m W	Brewery	1956	1552944
S	498m W	Brewery	1930	1547741

This data is sourced from Ordnance Survey / Groundsure.

2.2 Historical tanks

Records within 500m

3

Tank features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on **page 17**

ID	Location	Land Use	Date	Group ID
E	156m N	Unspecified Tank	1973	249658
E	156m N	Unspecified Tank	1991	249658
3	367m W	Unspecified Tank	1893	222959

This data is sourced from Ordnance Survey / Groundsure.



2.3 Historical energy features

Records within 500m

9

Energy features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on **page 17**

ID	Location	Land Use	Date	Group ID
B	69m SE	Electricity Substation	1986	135655
B	69m SE	Electricity Substation	1972	135655
D	229m NE	Electricity Substation	1973	128910
J	284m NE	Electricity Substation	1991	143350
J	284m NE	Electricity Substation	1973	143350
M	319m E	Electricity Substation	1972	143505
M	319m E	Electricity Substation	1986	143505
P	421m SE	Electricity Substation	1986	137638
P	421m SE	Electricity Substation	1972	137638

This data is sourced from Ordnance Survey / Groundsure.

2.4 Historical petrol stations

Records within 500m

0

Petrol stations digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

This data is sourced from Ordnance Survey / Groundsure.

2.5 Historical garages

Records within 500m

6

Garages digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on **page 17**



ID	Location	Land Use	Date	Group ID
A	38m W	Garage	1987	46869
A	39m W	Garage	1993	44904
A	39m W	Garage	1961	46869
A	40m W	Garage	1978	44904
K	266m NE	Maintenance Depot	1991	45820
K	280m NE	Maintenance Depot	1973	45820

This data is sourced from Ordnance Survey / Groundsure.



3 Waste and landfill



- Site Outline
- Search buffers in metres (m)
- Historical landfill (LA/OS)
- Waste exemptions

3.1 Active or recent landfill

Records within 500m

0

Active or recently closed landfill sites under Environment Agency/Natural Resources Wales regulation.

This data is sourced from the Environment Agency and Natural Resources Wales.

3.2 Historical landfill (BGS records)

Records within 500m

0

Landfill sites identified on a survey carried out on behalf of the DoE in 1973. These sites may have been closed or operational at this time.

This data is sourced from the British Geological Survey.



3.3 Historical landfill (LA/mapping records)

Records within 500m

1

Landfill sites identified from Local Authority records and high detail historical mapping.

Features are displayed on the Waste and landfill map on **page 22**

ID	Location	Site address	Source	Data type
2	380m NW	Refuse Tip	1961 mapping	Polygon

This data is sourced from the Ordnance Survey/Groundsure and Local Authority records.

3.4 Historical landfill (EA/NRW records)

Records within 500m

0

Known historical (closed) landfill sites (e.g. sites where there is no PPC permit or waste management licence currently in force). This includes sites that existed before the waste licensing regime and sites that have been licensed in the past but where a licence has been revoked, ceased to exist or surrendered and a certificate of completion has been issued.

This data is sourced from the Environment Agency and Natural Resources Wales.

3.5 Historical waste sites

Records within 500m

0

Waste site records derived from Local Authority planning records and high detail historical mapping.

This data is sourced from Ordnance Survey/Groundsure and Local Authority records.

3.6 Licensed waste sites

Records within 500m

0

Active or recently closed waste sites under Environment Agency/Natural Resources Wales regulation.

This data is sourced from the Environment Agency and Natural Resources Wales.

3.7 Waste exemptions

Records within 500m

8

Activities involving the storage, treatment, use or disposal of waste that are exempt from needing a permit. Exemptions have specific limits and conditions that must be adhered to.

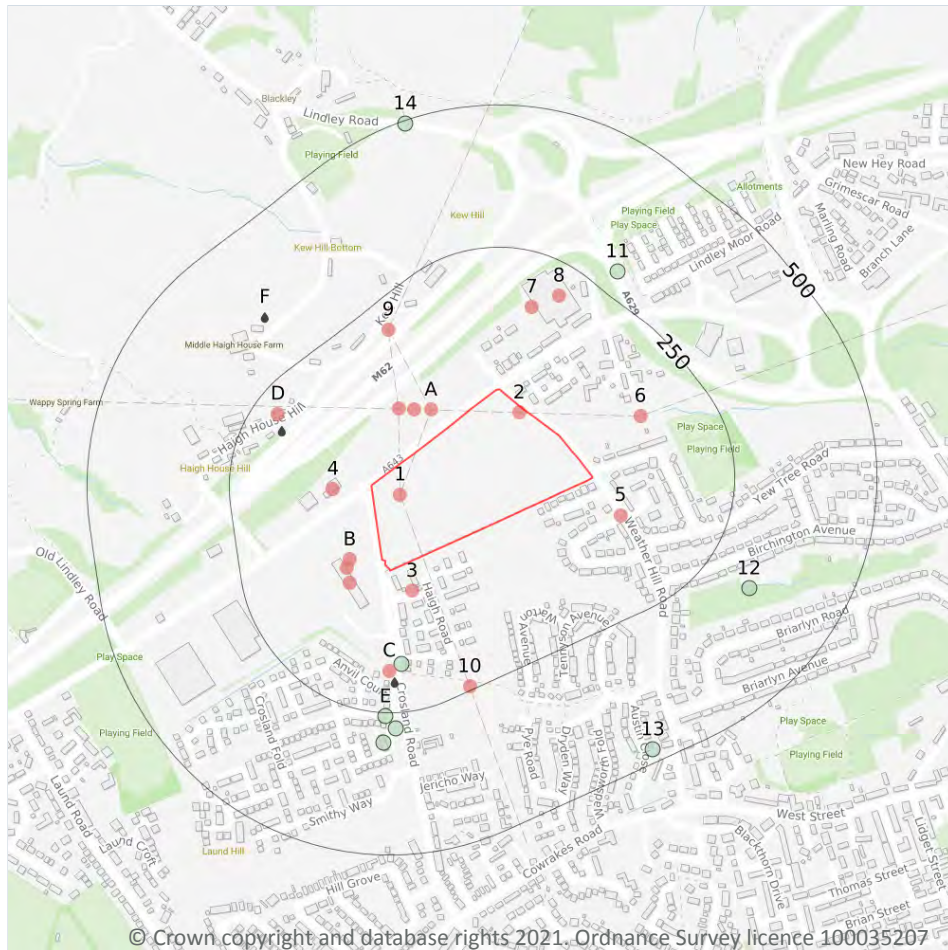
Features are displayed on the Waste and landfill map on **page 22**

ID	Location	Site	Reference	Category	Sub-Category	Description
1	288m W	-	WEX156692	Using waste exemption	On a Farm	Use of waste in construction
3	414m SE	Lindley Moor Weatherhill Road HD3 3LD	EPR/JH0974W S/A001	Using waste exemption	Non-Agricultural Waste Only	Use of waste in construction
A	418m NE	Residential Development-Farriers Croft, Lindley Moor, Huddersfield, HD3 3RT	WEX128350	Storing waste exemption	Not on a farm	Storage of waste in a secure place
A	418m NE	Residential Development-Farriers Croft, Lindley Moor, Huddersfield, HD3 3RT	WEX128350	Using waste exemption	Not on a farm	Use of waste in construction
B	425m NE	Motorway Maintenance Compound, Lindley Moor Road, Ainley, Huddersfield, HD33RH	WEX228885	Storing waste exemption	Not on a farm	Storage of waste in secure containers
B	425m NE	Motorway Maintenance Compound, Lindley Moor Road, Ainley, Huddersfield, HD33RH	WEX228885	Storing waste exemption	Not on a farm	Storage of waste in a secure place
B	425m NE	Motorway Maintenance Compound, Lindley Moor Road, Ainley, Huddersfield, HD33RH	WEX081824	Storing waste exemption	Not on a farm	Storage of waste in secure containers
B	425m NE	Motorway Maintenance Compound, Lindley Moor Road, Ainley, Huddersfield, HD33RH	WEX081824	Storing waste exemption	Not on a farm	Storage of waste in a secure place

This data is sourced from the Environment Agency and Natural Resources Wales.



4 Current industrial land use



- Site Outline
- Search buffers in metres (m)
- Recent industrial land uses
- Licensed Discharges to controlled waters
- Pollution Incidents (EA/NRW)

4.1 Recent industrial land uses

Records within 250m

18

Current potentially contaminative industrial sites.

Features are displayed on the Current industrial land use map on **page 25**

ID	Location	Company	Address	Activity	Category
1	On site	Pylon	West Yorkshire, HD3	Electrical Features	Infrastructure and Facilities
2	On site	Pylon	West Yorkshire, HD3	Electrical Features	Infrastructure and Facilities
A	43m NW	Pylon	West Yorkshire, HD3	Electrical Features	Infrastructure and Facilities



ID	Location	Company	Address	Activity	Category
3	48m SE	Electricity Sub Station	West Yorkshire, HD3	Electrical Features	Infrastructure and Facilities
B	56m W	Water Station	West Yorkshire, HD3	Water Pumping Stations	Industrial Features
A	62m NW	Pylon	West Yorkshire, HD3	Electrical Features	Infrastructure and Facilities
B	63m W	Electricity Sub Station	West Yorkshire, HD3	Electrical Features	Infrastructure and Facilities
4	68m W	J P I Road Planing Ltd	Lindley Moor Garage, Lindley Moor Road, Huddersfield, West Yorkshire, HD3 3TB	Construction and Tool Hire	Hire Services
B	70m SW	Mac's Truck Sales Ltd	Alexandra Park, Crosland Road, Huddersfield, West Yorkshire, HD3 3ZA	New Vehicles	Motoring
A	80m NW	Pylon	West Yorkshire, HD3	Electrical Features	Infrastructure and Facilities
5	82m SE	Electricity Sub Station	West Yorkshire, HD3	Electrical Features	Infrastructure and Facilities
6	132m NE	Pylon	West Yorkshire, HD3	Electrical Features	Infrastructure and Facilities
7	156m N	Tank	West Yorkshire, HD3	Tanks (Generic)	Industrial Features
C	176m S	Electricity Sub Station	West Yorkshire, HD3	Electrical Features	Infrastructure and Facilities
8	195m NE	John Fredericks Plastics	Lindley Moor Road, Huddersfield, West Yorkshire, HD3 3RW	General Construction Supplies	Industrial Products
9	200m NW	Pylon	West Yorkshire, HD3	Electrical Features	Infrastructure and Facilities
D	208m NW	R M McGill Transport	7, Haigh House Hill, Huddersfield, West Yorkshire, HD3 3SZ	Distribution and Haulage	Transport, Storage and Delivery
10	243m SE	Pylon	West Yorkshire, HD3	Electrical Features	Infrastructure and Facilities

This data is sourced from Ordnance Survey.



4.2 Current or recent petrol stations

Records within 500m**0**

Open, closed, under development and obsolete petrol stations.

This data is sourced from Experian.

4.3 Electricity cables

Records within 500m**0**

High voltage underground electricity transmission cables.

This data is sourced from National Grid.

4.4 Gas pipelines

Records within 500m**0**

High pressure underground gas transmission pipelines.

This data is sourced from National Grid.

4.5 Sites determined as Contaminated Land

Records within 500m**0**

Contaminated Land Register of sites designated under Part 2a of the Environmental Protection Act 1990.

This data is sourced from Local Authority records.

4.6 Control of Major Accident Hazards (COMAH)

Records within 500m**0**

Control of Major Accident Hazards (COMAH) sites. This data includes upper and lower tier sites, and includes a historical archive of COMAH sites and Notification of Installations Handling Hazardous Substances (NIHHS) records.

This data is sourced from the Health and Safety Executive.

4.7 Regulated explosive sites

Records within 500m**0**

Sites registered and licensed by the Health and Safety Executive under the Manufacture and Storage of Explosives Regulations 2005 (MSER). The last update to this data was in April 2011.

This data is sourced from the Health and Safety Executive.

4.8 Hazardous substance storage/usage

Records within 500m**0**

Consents granted for a site to hold certain quantities of hazardous substances at or above defined limits in accordance with the Planning (Hazardous Substances) Regulations 2015.

This data is sourced from Local Authority records.

4.9 Historical licensed industrial activities (IPC)

Records within 500m**0**

Integrated Pollution Control (IPC) records of substance releases to air, land and water. This data represents a historical archive as the IPC regime has been superseded.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.10 Licensed industrial activities (Part A(1))

Records within 500m**0**

Records of Part A(1) installations regulated under the Environmental Permitting (England and Wales) Regulations 2016 for the release of substances to the environment.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.11 Licensed pollutant release (Part A(2)/B)

Records within 500m**0**

Records of Part A(2) and Part B installations regulated under the Environmental Permitting (England and Wales) Regulations 2016 for the release of substances to the environment.

This data is sourced from Local Authority records.

4.12 Radioactive Substance Authorisations

Records within 500m

0

Records of the storage, use, accumulation and disposal of radioactive substances regulated under the Radioactive Substances Act 1993.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.13 Licensed Discharges to controlled waters

Records within 500m

6

Discharges of treated or untreated effluent to controlled waters under the Water Resources Act 1991.

Features are displayed on the Current industrial land use map on **page 25**

ID	Location	Address	Details	
D	184m NW	HAIGH HOUSE HILL, OFF LINDLEY MOOR ROAD, LINDLEY MOOR, HUDDERSFIELD, WEST YORKSHIRE	Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY Permit Number: WRA8864 Permit Version: 2 Receiving Water: GROUNDWATER VIA SOAKAWAY	Status: VARIED UNDER EPR 2010 Issue date: 26/07/2012 Effective Date: 26/07/2012 Revocation Date: -
D	184m NW	HAIGH HOUSE HILL, OFF LINDLEY MOOR ROAD, LINDLEY MOOR, HUDDERSFIELD, WEST YORKSHIRE	Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY Permit Number: WRA8864 Permit Version: 1 Receiving Water: GROUNDWATER VIA SOAKAWAY	Status: NEW CONSENT (WRA 91, S88 & SCHED 10 AS AMENDED BY ENV ACT 1995) Issue date: 25/08/2005 Effective Date: 25/08/2005 Revocation Date: 25/07/2012
C	196m S	FARRIERS CROFT, CROSLAND ROAD, LINDLEY MOOR, HUDDERSFIELD, WEST YORKSHIRE, HD3 3SU	Effluent Type: TRADE DISCHARGES - SITE DRAINAGE (CONTAM SURFACE WATER, NOT WASTE SIT) Permit Number: EPRDB3997NH Permit Version: 1 Receiving Water: SW DRAIN TO GRIMESCAR DIKE	Status: SURRENDERED UNDER EPR 2010 Issue date: 27/06/2016 Effective Date: 27/06/2016 Revocation Date: 19/06/2020
C	196m S	CROSLAND ROAD PHASE 2, LINDLEY MOOR, HUDDERSFIELD	Effluent Type: TRADE DISCHARGES - SITE DRAINAGE Permit Number: EPRNB3097AZ Permit Version: 1 Receiving Water: TRIBUTARY OF GRIMESCAR DIKE	Status: NEW ISSUED UNDER EPR 2010 Issue date: 21/06/2019 Effective Date: 21/06/2019 Revocation Date: -



ID	Location	Address	Details	
F	349m NW	MIDDLE HAIGH HOUSE FARM, LINDLEY, HUDDERSFIELD	Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY Permit Number: WRA9307 Permit Version: 1 Receiving Water: GROUNDWATER VIA SOAKAWAY	Status: NEW CONSENT (WRA 91, S88 & SCHED 10 AS AMENDED BY ENV ACT 1995) Issue date: 29/02/2008 Effective Date: 29/02/2008 Revocation Date: 25/07/2012
F	349m NW	MIDDLE HAIGH HOUSE FARM, LINDLEY, HUDDERSFIELD	Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY Permit Number: WRA9307 Permit Version: 2 Receiving Water: GROUNDWATER VIA SOAKAWAY	Status: NEW CONSENT (WRA 91, S88 & SCHED 10 AS AMENDED BY ENV ACT 1995) Issue date: 26/07/2012 Effective Date: 26/07/2012 Revocation Date: -

This data is sourced from the Environment Agency and Natural Resources Wales.

4.14 Pollutant release to surface waters (Red List)

Records within 500m

0

Discharges of specified substances under the Environmental Protection (Prescribed Processes and Substances) Regulations 1991.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.15 Pollutant release to public sewer

Records within 500m

0

Discharges of Special Category Effluents to the public sewer.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.16 List 1 Dangerous Substances

Records within 500m

0

Discharges of substances identified on List I of European Directive E 2006/11/EC, and regulated under the Environmental Damage (Prevention and Remediation) Regulations 2015.

This data is sourced from the Environment Agency and Natural Resources Wales.



4.17 List 2 Dangerous Substances

Records within 500m

0

Discharges of substances identified on List II of European Directive E 2006/11/EC, and regulated under the Environmental Damage (Prevention and Remediation) Regulations 2015.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.18 Pollution Incidents (EA/NRW)

Records within 500m

8

Records of substantiated pollution incidents. Since 2006 this data has only included category 1 (major) and 2 (significant) pollution incidents.

Features are displayed on the Current industrial land use map on **page 25**

ID	Location	Details	
C	165m S	Incident Date: 14/12/2015 Incident Identification: 1394444 Pollutant: Contaminated Water Pollutant Description: Suspended Solids	Water Impact: Category 1 (Major) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
E	256m S	Incident Date: 30/11/2015 Incident Identification: 1391148 Pollutant: Contaminated Water Pollutant Description: Suspended Solids	Water Impact: Category 1 (Major) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
E	277m S	Incident Date: 22/12/2015 Incident Identification: 1396165 Pollutant: Contaminated Water Pollutant Description: Suspended Solids	Water Impact: Category 2 (Significant) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
11	292m NE	Incident Date: 11/11/2002 Incident Identification: 120044 Pollutant: Specific Waste Materials Pollutant Description: Asbestos	Water Impact: Category 4 (No Impact) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
E	301m S	Incident Date: 20/11/2015 Incident Identification: 1389399 Pollutant: Contaminated Water Pollutant Description: Suspended Solids	Water Impact: Category 1 (Major) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
12	337m SE	Incident Date: 22/11/2013 Incident Identification: 1178050 Pollutant: Inert Materials and Wastes Pollutant Description: Soils and Clay	Water Impact: Category 1 (Major) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)

ID	Location	Details	
13	477m SE	Incident Date: 08/02/2018 Incident Identification: 1586591 Pollutant: Inert Materials and Wastes Pollutant Description: Soils and Clay	Water Impact: Category 2 (Significant) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
14	494m N	Incident Date: 22/11/2007 Incident Identification: 546841 Pollutant: Inert Materials and Wastes Pollutant Description: Other Inert Material or Waste	Water Impact: Category 4 (No Impact) Land Impact: Category 2 (Significant) Air Impact: Category 4 (No Impact)

This data is sourced from the Environment Agency and Natural Resources Wales.

4.19 Pollution inventory substances

Records within 500m	0
----------------------------	----------

The pollution inventory (substances) includes reporting on annual emissions of certain regulated substances to air, controlled waters and land. A reporting threshold for each substance is also included. Where emissions fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.

4.20 Pollution inventory waste transfers

Records within 500m	0
----------------------------	----------

The pollution inventory (waste transfers) includes reporting on annual transfers and recovery/disposal of controlled wastes from a site. A reporting threshold for each waste type is also included. Where releases fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.

4.21 Pollution inventory radioactive waste

Records within 500m	0
----------------------------	----------

The pollution inventory (radioactive wastes) includes reporting on annual releases of radioactive substances from a site, including the means of release. Where releases fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.

5 Hydrogeology - Superficial aquifer

5.1 Superficial aquifer

Records within 500m

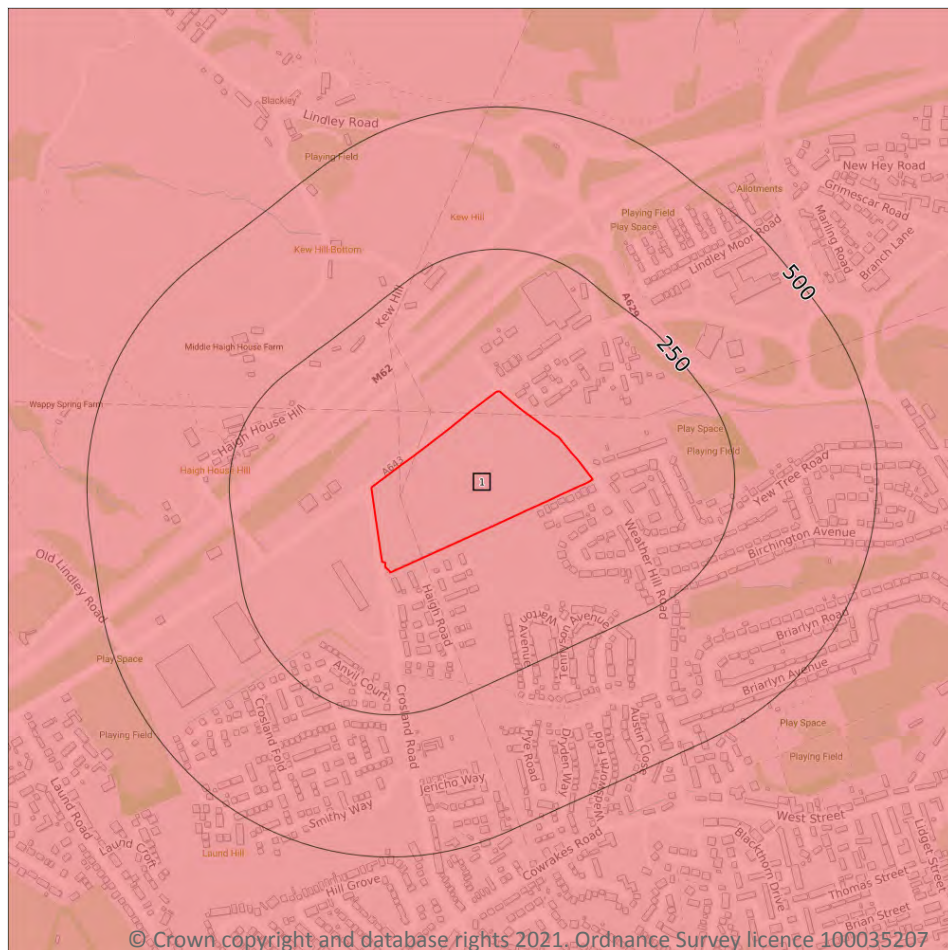
0

Aquifer status of groundwater held within superficial geology.

This data is sourced from the British Geological Survey, the Environment Agency and Natural Resources Wales.



Bedrock aquifer



- Site Outline
- Search buffers in metres (m)
- Principal
 - Secondary A
 - Secondary B
 - Secondary Undifferentiated
 - Unproductive

5.2 Bedrock aquifer

Records within 500m

1

Aquifer status of groundwater held within bedrock geology.

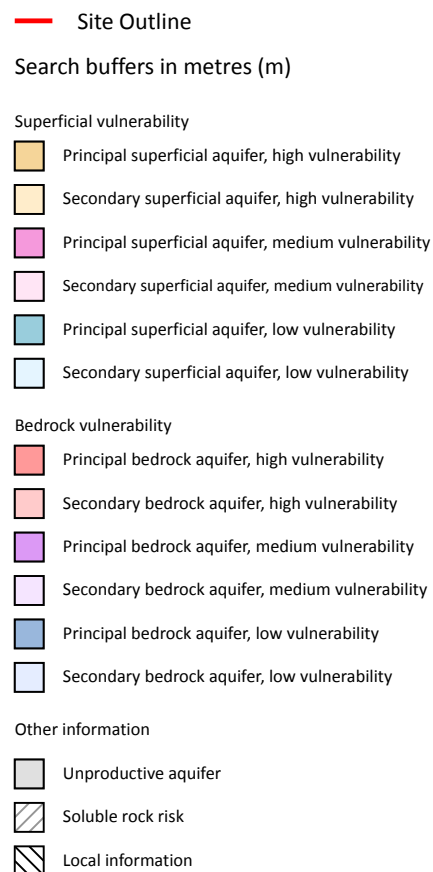
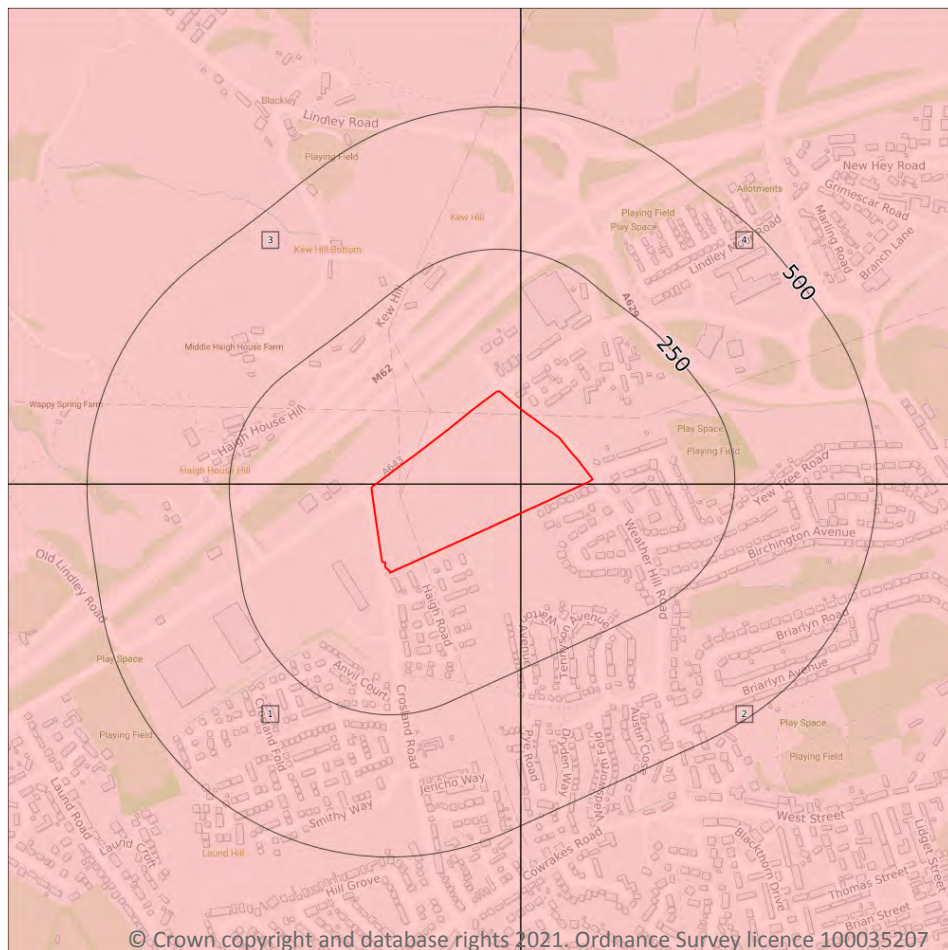
Features are displayed on the Bedrock aquifer map on **page 34**

ID	Location	Designation	Description
1	On site	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers

This data is sourced from the British Geological Survey, the Environment Agency and Natural Resources Wales.



Groundwater vulnerability



5.3 Groundwater vulnerability

Records within 50m

4

An assessment of the vulnerability of groundwater to a pollutant discharged at ground level based on the hydrological, geological, hydrogeological and soil properties within a one kilometre square grid. Groundwater vulnerability is described as High, Medium or Low as follows:

- High - Areas able to easily transmit pollution to groundwater. They are likely to be characterised by high leaching soils and the absence of low permeability superficial deposits.
- Medium - Intermediate between high and low vulnerability.
- Low - Areas that provide the greatest protection from pollution. They are likely to be characterised by low leaching soils and/or the presence of superficial deposits characterised by a low permeability.

Features are displayed on the Groundwater vulnerability map on **page 35**

ID	Location	Summary	Soil / surface	Superficial geology	Bedrock geology
1	On site	Summary Classification: Secondary bedrock aquifer - High Vulnerability Combined classification: Productive Bedrock Aquifer, No Superficial Aquifer	Leaching class: High Infiltration value: >70% Dilution value: >550mm/year	Vulnerability: - Aquifer type: - Thickness: 3-10m Patchiness value: <90% Recharge potential: No Data	Vulnerability: High Aquifer type: Secondary Flow mechanism: Well connected fractures
2	On site	Summary Classification: Secondary bedrock aquifer - High Vulnerability Combined classification: Productive Bedrock Aquifer, No Superficial Aquifer	Leaching class: High Infiltration value: >70% Dilution value: >550mm/year	Vulnerability: - Aquifer type: - Thickness: <3m Patchiness value: <90% Recharge potential: No Data	Vulnerability: High Aquifer type: Secondary Flow mechanism: Well connected fractures
3	On site	Summary Classification: Secondary bedrock aquifer - High Vulnerability Combined classification: Productive Bedrock Aquifer, No Superficial Aquifer	Leaching class: Intermediate Infiltration value: >70% Dilution value: >550mm/year	Vulnerability: - Aquifer type: - Thickness: 3-10m Patchiness value: <90% Recharge potential: No Data	Vulnerability: High Aquifer type: Secondary Flow mechanism: Well connected fractures
4	On site	Summary Classification: Secondary bedrock aquifer - High Vulnerability Combined classification: Productive Bedrock Aquifer, No Superficial Aquifer	Leaching class: High Infiltration value: >70% Dilution value: >550mm/year	Vulnerability: - Aquifer type: - Thickness: 3-10m Patchiness value: <90% Recharge potential: No Data	Vulnerability: High Aquifer type: Secondary Flow mechanism: Well connected fractures

This data is sourced from the British Geological Survey, the Environment Agency and Natural Resources Wales.

5.4 Groundwater vulnerability- soluble rock risk

Records on site

0

This dataset identifies areas where solution features that enable rapid movement of a pollutant may be present within a 1km grid square.

This data is sourced from the British Geological Survey and the Environment Agency.

5.5 Groundwater vulnerability- local information

Records on site

0

This dataset identifies areas where additional local information affecting vulnerability is held by the Environment Agency. Further information can be obtained by contacting the Environment Agency local Area groundwater team through the Environment Agency National Customer Call Centre on 03798 506 506 or by email on enquiries@environment-agency.gov.uk.

This data is sourced from the British Geological Survey and the Environment Agency.



Abstractions and Source Protection Zones



- Site Outline
- Search buffers in metres (m)
- Source Protection Zone 1
Inner catchment
- Source Protection Zone 2
Outer catchment
- Source Protection Zone 3
Total catchment
- Source Protection Zone 4
Zone of Special Interest
- Source Protection Zone 1c
Inner catchment - confined aquifer
- Source Protection Zone 2c
Outer catchment - confined aquifer
- Source Protection Zone 3c
Total catchment - confined aquifer
- Drinking water abstraction licences
Polygon features
- Drinking water abstraction licences
Linear features
- Groundwater abstraction licence (point)
- Groundwater abstraction licence (area)
- Groundwater abstraction licence (linear)
- Surface Water Abstractions (point)
- Surface Water Abstractions (area)
- Surface Water Abstractions (linear)

5.6 Groundwater abstractions

Records within 2000m

14

Licensed groundwater abstractions for sites extracting more than 20 cubic metres of water a day and includes active and historical records. The data may be for a single abstraction point, between two points (line data) or a larger area.

Features are displayed on the Abstractions and Source Protection Zones map on **page 37**

ID	Location	Details	
A	499m W	Status: Historical Licence No: 2/27/12/191 Details: General Farming & Domestic Direct Source: GROUNDWATERS Point: SPRING Data Type: Point Name: BAIRSTOW Easting: 410250 Northing: 418870	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 28/04/1966 Expiry Date: - Issue No: 100 Version Start Date: 28/04/1966 Version End Date: -
A	499m W	Status: Historical Licence No: 2/27/12/191 Details: General Farming & Domestic Direct Source: GROUNDWATERS Point: SPRING - HOLYWELL GREEN Data Type: Point Name: BAIRSTOW Easting: 410250 Northing: 418870	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 28/04/1966 Expiry Date: - Issue No: 100 Version Start Date: 28/04/1966 Version End Date: -
-	1120m SE	Status: Historical Licence No: 2/27/11/058 Details: General use relating to Secondary Category (Medium Loss) Direct Source: GROUNDWATERS Point: SPRINGCATCHMENT AREA Data Type: Point Name: JOSEPH SYKES BROTHERS Easting: 411400 Northing: 417900	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 20/01/1966 Expiry Date: - Issue No: 100 Version Start Date: 20/01/1966 Version End Date: -
-	1120m SE	Status: Historical Licence No: 2/27/11/058 Details: Boiler Feed Direct Source: GROUNDWATERS Point: SPRINGCATCHMENT AREA Data Type: Point Name: JOSEPH SYKES BROTHERS Easting: 411400 Northing: 417900	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 20/01/1966 Expiry Date: - Issue No: 100 Version Start Date: 20/01/1966 Version End Date: -
-	1120m SE	Status: Historical Licence No: 2/27/11/058 Details: Boiler Feed Direct Source: GROUNDWATERS Point: SPRING - LINDLEY Data Type: Point Name: CALDERDALE & HUDDERSFIELD NHS TRUST Easting: 411400 Northing: 417900	Annual Volume (m ³): 24094 Max Daily Volume (m ³): 65.5 Original Application No: - Original Start Date: 20/01/1966 Expiry Date: - Issue No: 101 Version Start Date: 01/04/2008 Version End Date: -



ID	Location	Details	
-	1120m SE	Status: Historical Licence No: 2/27/11/058 Details: General Use Relating To Secondary Category (Medium Loss) Direct Source: GROUNDWATERS Point: SPRING - LINDLEY Data Type: Point Name: CALDERDALE & HUDDERSFIELD NHS TRUST Easting: 411400 Northing: 417900	Annual Volume (m ³): 24094 Max Daily Volume (m ³): 65.5 Original Application No: - Original Start Date: 20/01/1966 Expiry Date: - Issue No: 101 Version Start Date: 01/04/2008 Version End Date: -
-	1476m SE	Status: Historical Licence No: 2/27/10/120 Details: General use relating to Secondary Category (Medium Loss) Direct Source: GROUNDWATERS Point: BOREHOLE Data Type: Point Name: JOHN GLADSTONE & COMPANY LIMITED Easting: 411600 Northing: 417600	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 21/01/1997 Expiry Date: 31/12/2001 Issue No: 100 Version Start Date: 21/01/1997 Version End Date: -
-	1590m NW	Status: Historical Licence No: 2/27/12/323 Details: Spray Irrigation - Direct Direct Source: GROUNDWATERS Point: BOREHOLE Data Type: Point Name: ELLAND GOLF CLUB Easting: 409700 Northing: 420200	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 16/10/1998 Expiry Date: 31/10/2008 Issue No: 100 Version Start Date: 16/10/1998 Version End Date: -
-	1590m NW	Status: Historical Licence No: 2/27/12/323 Details: Spray Irrigation - Direct Direct Source: GROUNDWATERS Point: BOREHOLE - COAL MEASURES - ELLAND Data Type: Point Name: ELLAND GOLF CLUB Easting: 409700 Northing: 420200	Annual Volume (m ³): 6750 Max Daily Volume (m ³): 45 Original Application No: - Original Start Date: 16/10/1998 Expiry Date: 31/10/2008 Issue No: 100 Version Start Date: 16/10/1998 Version End Date: -
-	1590m NW	Status: Active Licence No: 2/27/12/341 Details: Spray Irrigation - Direct Direct Source: GROUNDWATERS Point: BOREHOLE - COAL MEASURES - ELLAND Data Type: Point Name: ELLAND GOLF CLUB Easting: 409700 Northing: 420200	Annual Volume (m ³): 3,750 Max Daily Volume (m ³): 45 Original Application No: - Original Start Date: 01/04/2009 Expiry Date: - Issue No: 1 Version Start Date: 01/04/2009 Version End Date: -



ID	Location	Details	
-	1783m SE	Status: Historical Licence No: 2/27/11/186 Details: General use relating to Secondary Category (Medium Loss) Direct Source: GROUNDWATERS Point: BOREHOLE-MILLSTONE GRIT-OAKES-HUDDERSFIELD Data Type: Point Name: T E NEWSHOLME LIMITED Easting: 411940 Northing: 417420	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 10/06/2000 Expiry Date: 31/12/2009 Issue No: 1 Version Start Date: 10/06/2000 Version End Date: -
-	1783m SE	Status: Historical Licence No: 2/27/11/186 Details: General Use Relating To Secondary Category (Medium Loss) Direct Source: GROUNDWATERS Point: BOREHOLE - MILLSTONE GRIT- OAKES Data Type: Point Name: T E NEWSHOLME LTD Easting: 411940 Northing: 417420	Annual Volume (m ³): 35000 Max Daily Volume (m ³): 96 Original Application No: - Original Start Date: 10/06/2000 Expiry Date: 31/12/2009 Issue No: 1 Version Start Date: 10/06/2000 Version End Date: -
-	1935m W	Status: Historical Licence No: 2/27/12/273 Details: General use relating to Secondary Category (Medium Loss) Direct Source: GROUNDWATERS Point: BOREHOLE Data Type: Point Name: CLARIANT UK LIMITED Easting: 408900 Northing: 419600	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 19/09/1973 Expiry Date: - Issue No: 100 Version Start Date: 22/01/1999 Version End Date: -
-	1935m W	Status: Historical Licence No: 2/27/12/273 Details: General Use Relating To Secondary Category (Medium Loss) Direct Source: GROUNDWATERS Point: BOREHOLE - MILLSTONE GRIT - STAINLAND Data Type: Point Name: RHODIA UK LTD Easting: 408900 Northing: 419600	Annual Volume (m ³): 182000 Max Daily Volume (m ³): 818 Original Application No: - Original Start Date: 19/09/1973 Expiry Date: - Issue No: 104 Version Start Date: 15/08/2011 Version End Date: -

This data is sourced from the Environment Agency and Natural Resources Wales.



5.7 Surface water abstractions

Records within 2000m

4

Licensed surface water abstractions for sites extracting more than 20 cubic metres of water a day and includes active and historical records. The data may be for a single abstraction point, a stretch of watercourse or a larger area.

Features are displayed on the Abstractions and Source Protection Zones map on **page 37**

ID	Location	Details	
-	1935m W	Status: Historical Licence No: 2/27/12/125 Details: General use relating to Secondary Category (Medium Loss) Direct Source: SURFACE WATER Point: STREAM Data Type: Point Name: CLARIANT UK LIMITED Easting: 408900 Northing: 419600	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 20/01/1966 Expiry Date: - Issue No: 100 Version Start Date: 22/01/1999 Version End Date: -
-	1935m W	Status: Historical Licence No: 2/27/12/125 Details: General Use Relating To Secondary Category (Medium Loss) Direct Source: SURFACE WATER Point: STREAM - STAINLAND Data Type: Point Name: RHODIA UK LTD Easting: 408900 Northing: 419600	Annual Volume (m ³): 182000 Max Daily Volume (m ³): 818 Original Application No: - Original Start Date: 20/01/1966 Expiry Date: - Issue No: 104 Version Start Date: 15/08/2011 Version End Date: -
-	1979m S	Status: Historical Licence No: 2/27/11/115 Details: General use relating to Secondary Category (Medium Loss) Direct Source: SURFACE WATER Point: CLAY WOOD BROOK/OAKSCAR RESERVOIR Data Type: Point Name: PARKWOOD MILLS CO LTD Easting: 410400 Northing: 416900	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 28/04/1966 Expiry Date: - Issue No: 101 Version Start Date: 22/04/2002 Version End Date: -

ID	Location	Details	
-	1984m S	Status: Historical Licence No: 2/27/11/123 Details: General use relating to Secondary Category (Medium Loss) Direct Source: SURFACE WATER Point: CLAY WOOD BROOK-PARKWOOD ROAD-LONGWOOD Data Type: Point Name: PARKWOOD MILLS CO LTD Easting: 410330 Northing: 416910	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 26/05/1966 Expiry Date: - Issue No: 102 Version Start Date: 30/08/2002 Version End Date: -

This data is sourced from the Environment Agency and Natural Resources Wales.

5.8 Potable abstractions

Records within 2000m

0

Licensed potable water abstractions for sites extracting more than 20 cubic metres of water a day and includes active and historical records. The data may be for a single abstraction point, a stretch of watercourse or a larger area.

This data is sourced from the Environment Agency and Natural Resources Wales.

5.9 Source Protection Zones

Records within 500m

1

Source Protection Zones define the sensitivity of an area around a potable abstraction site to contamination. Features are displayed on the Abstractions and Source Protection Zones map on **page 37**

ID	Location	Type	Description
1	311m W	2	Outer catchment

This data is sourced from the Environment Agency and Natural Resources Wales.

5.10 Source Protection Zones (confined aquifer)

Records within 500m

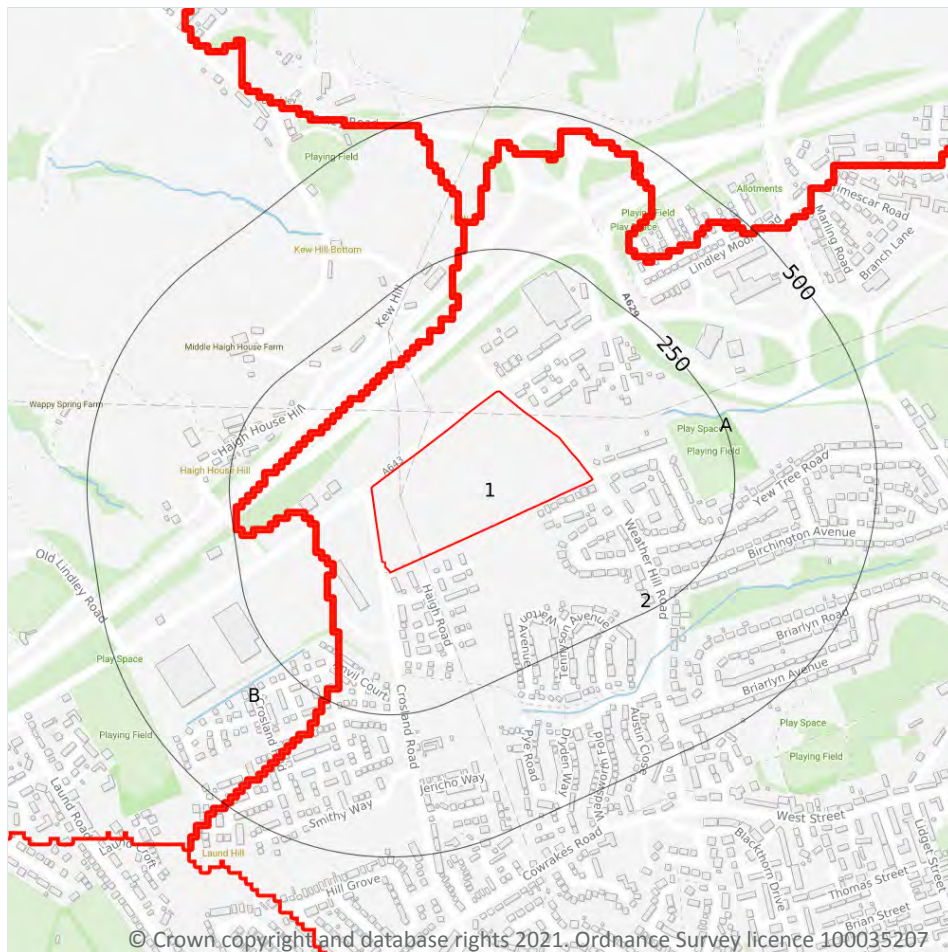
0

Source Protection Zones in the confined aquifer define the sensitivity around a deep groundwater abstraction to contamination. A confined aquifer would normally be protected from contamination by overlying geology and is only considered a sensitive resource if deep excavation/drilling is taking place.

This data is sourced from the Environment Agency and Natural Resources Wales.



6 Hydrology



- Site Outline
- Search buffers in metres (m)
- Water Network (OS MasterMap)
- Surface water features (wider than 5m)
- Surface water features (narrower than 5m)
- ⋯ WFD River, canal and surface water transfer water bodies
- WFD Lake water bodies
- WFD Transitional and coastal water bodies
- WFD Surface water body catchments boundaries
- WFD Groundwater body boundaries

6.1 Water Network (OS MasterMap)

Records within 250m

2

Detailed water network of Great Britain showing the flow and precise central course of every river, stream, lake and canal.

Features are displayed on the Hydrology map on **page 43**

ID	Location	Type of water feature	Ground level	Permanence	Name
A	166m NE	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-



ID	Location	Type of water feature	Ground level	Permanence	Name
B	202m SW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-

This data is sourced from the Ordnance Survey.

6.2 Surface water features

Records within 250m	2
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Covering rivers, streams and lakes (some overlap with OS MasterMap Water Network data in previous section) but additionally covers smaller features such as ponds. Rivers and streams narrower than 5m are represented as a single line. Lakes, ponds and rivers or streams wider than 5m are represented as polygons.

Features are displayed on the Hydrology map on **page 43**

This data is sourced from the Ordnance Survey.

6.3 WFD Surface water body catchments

Records on site	1
------------------------	----------

The Water Framework Directive is an EU-led framework for the protection of inland surface waters, estuaries, coastal waters and groundwater through river basin-level management planning. In terms of surface water, these basins are broken down into smaller units known as management, operational and water body catchments.

Features are displayed on the Hydrology map on **page 43**

ID	Location	Type	Water body catchment	Water body ID	Operational catchment	Management catchment
2	On site	River WB catchment	Colne from River Holme to River Calder	GB104027062550	Colne and Holme	Aire and Calder

This data is sourced from the Environment Agency and Natural Resources Wales.

6.4 WFD Surface water bodies

Records identified	1
---------------------------	----------

Surface water bodies under the Directive may be rivers, lakes, estuary or coastal. To achieve the purpose of the Directive, environmental objectives have been set and are reported on for each water body. The progress towards delivery of the objectives is then reported on by the relevant competent authorities at the end of each six-year cycle. The river water body directly associated with the catchment listed in the previous section is detailed below, along with any lake, canal, coastal or artificial water body within 250m of the site. Click on the

water body ID in the table to visit the EA Catchment Explorer to find out more about each water body listed. Features are displayed on the Hydrology map on **page 43**

ID	Location	Type	Name	Water body ID	Overall rating	Chemical rating	Ecological rating	Year
-	573m NE	River	Colne from River Holme to River Calder	GB104027062550	Moderate	Good	Moderate	2016

This data is sourced from the Environment Agency and Natural Resources Wales.

6.5 WFD Groundwater bodies

Records on site	1
------------------------	----------

Groundwater bodies are also covered by the Directive and the same regime of objectives and reporting detailed in the previous section is in place. Click on the water body ID in the table to visit the EA Catchment Explorer to find out more about each groundwater body listed.

Features are displayed on the Hydrology map on **page 43**

ID	Location	Name	Water body ID	Overall rating	Chemical rating	Quantitative	Year
1	On site	Aire & Calder Carb Limestone / Millstone Grit / Coal Measures.	GB40402G700400	Poor	Poor	Good	2015

This data is sourced from the Environment Agency and Natural Resources Wales.

7 River and coastal flooding

7.1 Risk of Flooding from Rivers and Sea (RoFRaS)

Records within 50m

0

The chance of flooding from rivers and/or the sea in any given year, based on cells of 50m. Each cell is allocated one of four flood risk categories, taking into account flood defences and their condition; Very low (less than 1 in 1000 chance in any given year), Low (less than 1 in 100 but greater than or equal to 1 in 1000 chance), Medium (less than 1 in 30 but greater than or equal to 1 in 100 chance) or High (greater than or equal to 1 in 30 chance).

This data is sourced from the Environment Agency and Natural Resources Wales.

7.2 Historical Flood Events

Records within 250m

0

Records of historic flooding from rivers, the sea, groundwater and surface water. Records began in 1946 when predecessor bodies started collecting detailed information about flooding incidents, although limited details may be included on flooding incidents prior to this date. Takes into account the presence of defences, structures, and other infrastructure where they existed at the time of flooding, and includes flood extents that may have been affected by overtopping, breaches or blockages.

This data is sourced from the Environment Agency and Natural Resources Wales.

7.3 Flood Defences

Records within 250m

0

Records of flood defences owned, managed or inspected by the Environment Agency and Natural Resources Wales. Flood defences can be structures, buildings or parts of buildings. Typically these are earth banks, stone and concrete walls, or sheet-piling that is used to prevent or control the extent of flooding.

This data is sourced from the Environment Agency and Natural Resources Wales.

7.4 Areas Benefiting from Flood Defences

Records within 250m

0

Areas that would benefit from the presence of flood defences in a 1 in 100 (1%) chance of flooding each year from rivers or 1 in 200 (0.5%) chance of flooding each year from the sea.

This data is sourced from the Environment Agency and Natural Resources Wales.

7.5 Flood Storage Areas

Records within 250m

0

Areas that act as a balancing reservoir, storage basin or balancing pond to attenuate an incoming flood peak to a flow level that can be accepted by the downstream channel or to delay the timing of a flood peak so that its volume is discharged over a longer period.

This data is sourced from the Environment Agency and Natural Resources Wales.



River and coastal flooding - Flood Zones

7.6 Flood Zone 2

Records within 50m	0
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Areas of land at risk of flooding, when the presence of flood defences are ignored. Covering land between Flood Zone 3 (see next section) and the extent of the flooding from rivers or the sea with a 1 in 1000 (0.1%) chance of flooding each year.

This data is sourced from the Environment Agency and Natural Resources Wales.

7.7 Flood Zone 3

Records within 50m	0
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Areas of land at risk of flooding, when the presence of flood defences are ignored. Covering land with a 1 in 100 (1%) or greater chance of flooding each year from rivers or a 1 in 200 (0.5%) or greater chance of flooding each year from the sea.

This data is sourced from the Environment Agency and Natural Resources Wales.



8 Surface water flooding

8.1 Surface water flooding

Highest risk on site

Negligible

Highest risk within 50m

Negligible

Ambiental Risk Analytics surface water (pluvial) FloodMap identifies areas likely to flood as a result of extreme rainfall events, i.e. land naturally vulnerable to surface water ponding or flooding. This data set was produced by simulating 1 in 30 year, 1 in 100 year, 1 in 250 year and 1 in 1,000 year rainfall events. Modern urban drainage systems are typically built to cope with rainfall events between 1 in 20 and 1 in 30 years, though some older ones may flood in a 1 in 5 year rainfall event.

The data shown on the map and in the table above shows the highest likelihood of flood events happening at the site. Lower likelihood events may have greater flood depths and hence a greater potential impact on a site. The table below shows the maximum flood depths for a range of return periods for the site.

Return period	Maximum modelled depth
1 in 1000 year	Negligible
1 in 250 year	Negligible
1 in 100 year	Negligible
1 in 30 year	Negligible

This data is sourced from Ambiental Risk Analytics.



9 Groundwater flooding



— Site Outline
Search buffers in metres (m)

- High
- Moderate - High
- Moderate
- Low
- Negligible

9.1 Groundwater flooding

Highest risk on site

Negligible

Highest risk within 50m

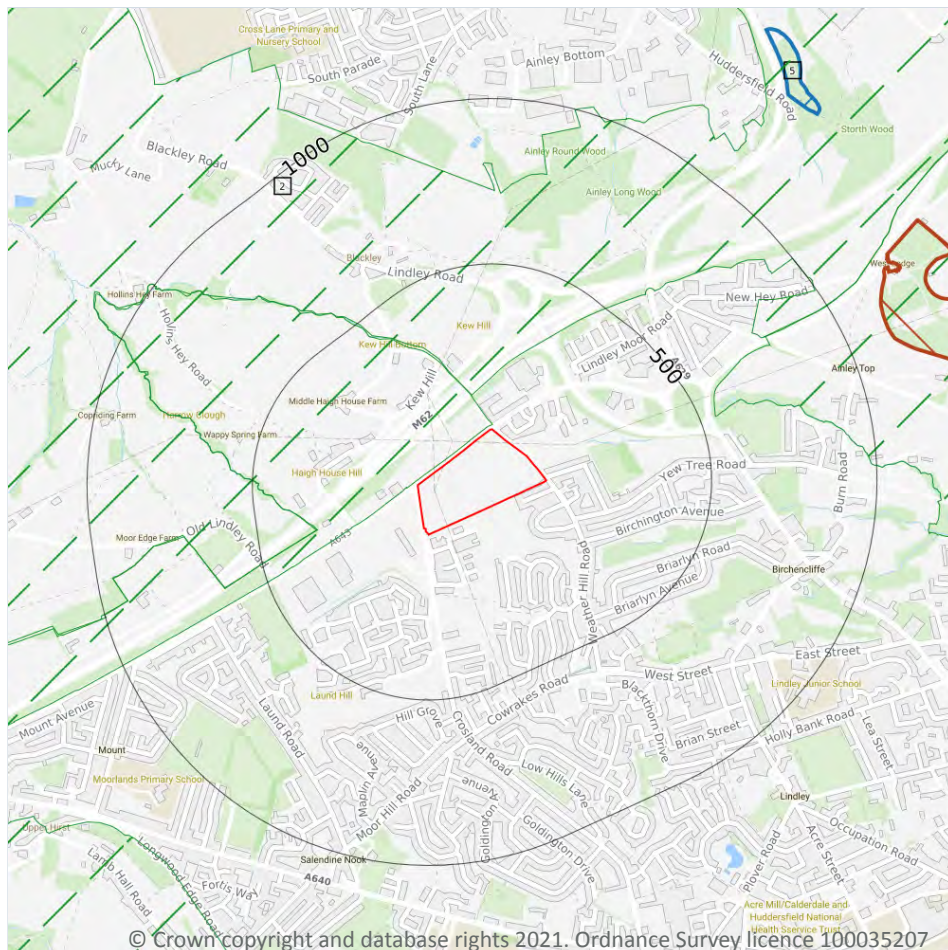
Negligible

Groundwater flooding is caused by unusually high groundwater levels. It occurs when the water table rises above the ground surface or within underground structures such as basements or cellars. Groundwater flooding tends to exhibit a longer duration than surface water flooding, possibly lasting for weeks or months, and as a result it can cause significant damage to property. This risk assessment is based on a 1 in 100 year return period and a 5m Digital Terrain Model (DTM).

Features are displayed on the Groundwater flooding map on **page 50**

This data is sourced from Ambiantal Risk Analytics.

10 Environmental designations



- Site Outline
- Search buffers in metres (m)
- Sites of Special Scientific Interest (SSSI)
- Designated Ancient Woodland
- Green Belt

10.1 Sites of Special Scientific Interest (SSSI)

Records within 2000m

1

Sites providing statutory protection for the best examples of UK flora, fauna, or geological or physiographical features. Originally notified under the National Parks and Access to the Countryside Act 1949, SSSIs were re-notified under the Wildlife and Countryside Act 1981. Improved provisions for the protection and management of SSSIs were introduced by the Countryside and Rights of Way Act 2000 (in England and Wales) and (in Scotland) by the Nature Conservation (Scotland) Act 2004 and the Wildlife and Natural Environment (Scotland) Act 2010.

Features are displayed on the Environmental designations map on **page 51**

ID	Location	Name	Data source
5	1348m NE	Elland Bypass Cutting	Natural England



This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.2 Conserved wetland sites (Ramsar sites)

Records within 2000m

0

Ramsar sites are designated under the Convention on Wetlands of International Importance, agreed in Ramsar, Iran, in 1971. They cover all aspects of wetland conservation and wise use, recognizing wetlands as ecosystems that are extremely important for biodiversity conservation in general and for the well-being of human communities. These sites cover a broad definition of wetland; marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, and even some marine areas.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.3 Special Areas of Conservation (SAC)

Records within 2000m

0

Areas which have been identified as best representing the range and variety within the European Union of habitats and (non-bird) species listed on Annexes I and II to the Directive. SACs are designated under the EC Habitats Directive.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.4 Special Protection Areas (SPA)

Records within 2000m

0

Sites classified by the UK Government under the EC Birds Directive, SPAs are areas of the most important habitat for rare (listed on Annex I to the Directive) and migratory birds within the European Union.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.5 National Nature Reserves (NNR)

Records within 2000m

0

Sites containing examples of some of the most important natural and semi-natural terrestrial and coastal ecosystems in Great Britain. They are managed to conserve their habitats, provide special opportunities for scientific study or to provide public recreation compatible with natural heritage interests.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.6 Local Nature Reserves (LNR)

Records within 2000m

0

Sites managed for nature conservation, and to provide opportunities for research and education, or simply enjoying and having contact with nature. They are declared by local authorities under the National Parks and Access to the Countryside Act 1949 after consultation with the relevant statutory nature conservation agency.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.7 Designated Ancient Woodland

Records within 2000m

4

Ancient woodlands are classified as areas which have been wooded continuously since at least 1600 AD. This includes semi-natural woodland and plantations on ancient woodland sites. 'Wooded continuously' does not mean there is or has previously been continuous tree cover across the whole site, and not all trees within the woodland have to be old.

Features are displayed on the Environmental designations map on **page 51**

ID	Location	Name	Woodland Type
4	1132m NE	Gernhill Wood	Ancient Replanted Woodland
-	1448m E	Grimescar Wood	Ancient Replanted Woodland
-	1476m E	Grimescar Wood	Ancient Replanted Woodland
-	1772m SW	Unknown	Ancient Replanted Woodland

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.8 Biosphere Reserves

Records within 2000m

0

Biosphere Reserves are internationally recognised by UNESCO as sites of excellence to balance conservation and socioeconomic development between nature and people. They are recognised under the Man and the Biosphere (MAB) Programme with the aim of promoting sustainable development founded on the work of the local community.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.9 Forest Parks

Records within 2000m

0

These are areas managed by the Forestry Commission designated on the basis of recreational, conservation or scenic interest.

This data is sourced from the Forestry Commission.

10.10 Marine Conservation Zones

Records within 2000m

0

A type of marine nature reserve in UK waters established under the Marine and Coastal Access Act (2009). They are designated with the aim to protect nationally important, rare or threatened habitats and species.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.11 Green Belt

Records within 2000m

3

Areas designated to prevent urban sprawl by keeping land permanently open.

Features are displayed on the Environmental designations map on **page 51**

ID	Location	Name	Local Authority name
1	11m NW	South and West Yorkshire	Kirklees
2	118m NW	South and West Yorkshire	Calderdale
3	547m E	South and West Yorkshire	Kirklees

This data is sourced from the Ministry of Housing, Communities and Local Government.

10.12 Proposed Ramsar sites

Records within 2000m

0

Ramsar sites are areas listed as a Wetland of International Importance under the Convention on Wetlands of International Importance especially as Waterfowl Habitat (the Ramsar Convention) 1971. The sites here supplied have a status of 'Proposed' having been identified for potential adoption under the framework.

This data is sourced from Natural England.

10.13 Possible Special Areas of Conservation (pSAC)

Records within 2000m**0**

Special Areas of Conservation are areas which have been identified as best representing the range and variety within the European Union of habitats and (non-bird) species listed on Annexes I and II to the Directive. SACs are designated under the EC Habitats Directive. Those sites supplied here are those with a status of 'Possible' having been identified for potential adoption under the framework.

This data is sourced from Natural England and Natural Resources Wales.

10.14 Potential Special Protection Areas (pSPA)

Records within 2000m**0**

Special Protection Areas (SPAs) are areas designated (or 'classified') under the European Union Wild Birds Directive for the protection of nationally and internationally important populations of wild birds. Those sites supplied here are those with a status of 'Potential' having been identified for potential adoption under the framework.

This data is sourced from Natural England.

10.15 Nitrate Sensitive Areas

Records within 2000m**0**

Areas where nitrate concentrations in drinking water sources exceeded or was at risk of exceeding the limit of 50 mg/l set by the 1980 EC Drinking Water Directive. Voluntary agricultural measures as a means of reducing the levels of nitrate were introduced by DEFRA as MAFF, with payments being made to farmers who complied. The scheme was started as a pilot in 1990 in ten areas, later implemented within 32 areas. The scheme was closed to further new entrants in 1998, although existing agreements continued for their full term. All Nitrate Sensitive Areas fell within the areas designated as Nitrate Vulnerable Zones (NVZs) in 1996 under the EC Nitrate Directive (91/676/EEC).

This data is sourced from Natural England.

10.16 Nitrate Vulnerable Zones

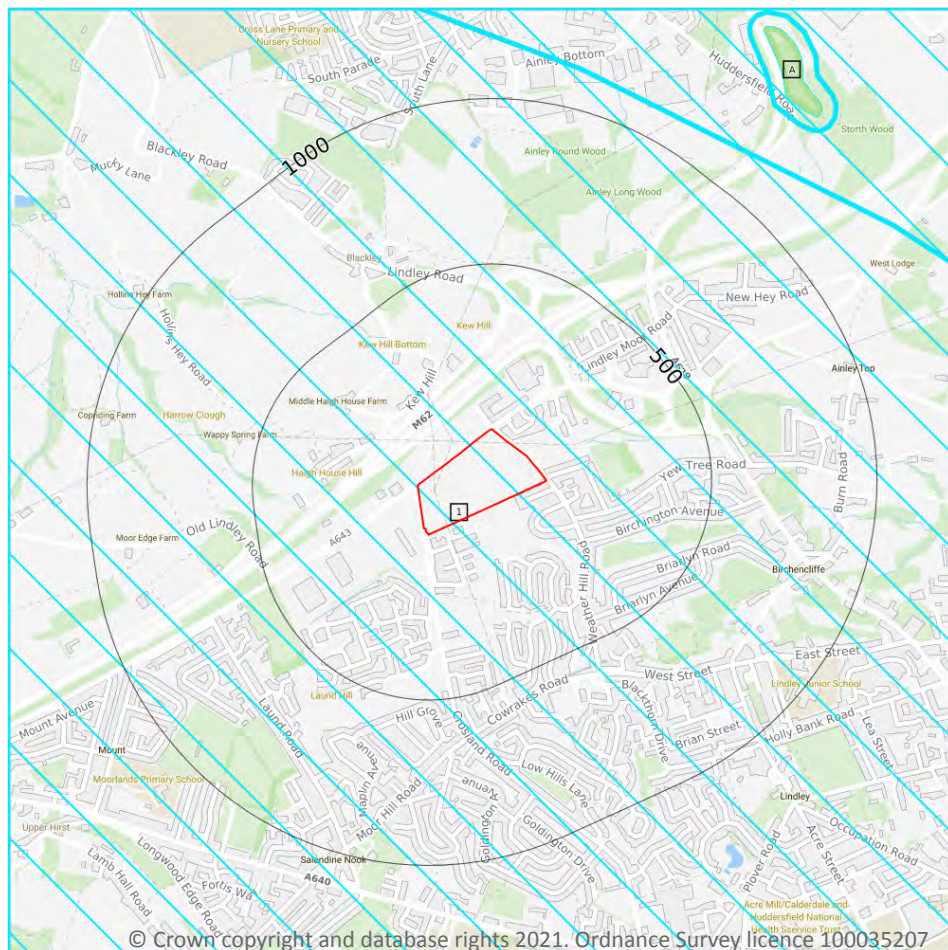
Records within 2000m**0**

Areas at risk from agricultural nitrate pollution designated under the EC Nitrate Directive (91/676/EEC). These are areas of land that drain into waters polluted by nitrates. Farmers operating within these areas have to follow mandatory rules to tackle nitrate loss from agriculture.

This data is sourced from Natural England and Natural Resources Wales.



SSSI Impact Zones and Units



- Site Outline
- Search buffers in metres (m)
- SSSI Impact Risk Zones
- SSSI Units
- Not recorded
- Favourable
- Unfavourable - Recovering
- Unfavourable - No change
- Unfavourable - Declining
- Partially destroyed
- Destroyed

10.17 SSSI Impact Risk Zones

Records on site

1

Developed to allow rapid initial assessment of the potential risks to SSSIs posed by development proposals. They define zones around each SSSI which reflect the particular sensitivities of the features for which it is notified and indicate the types of development proposal which could potentially have adverse impacts.

Features are displayed on the SSSI Impact Zones and Units map on **page 56**

ID	Location	Type of developments requiring consultation
1	On site	Infrastructure - Airports, helipads and other aviation proposals. Minerals, Oil and Gas - Oil & gas exploration/extraction. Air pollution - Livestock & poultry units with floorspace > 500m ² , slurry lagoons > 4000m ² . Combustion - General combustion processes >50MW energy input. Incl: energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis/gasification, anaerobic digestion, sewage treatment works, other incineration/ combustion

This data is sourced from Natural England.

10.18 SSSI Units

Records within 2000m	1
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Divisions of SSSIs used to record management and condition details. Units are the smallest areas for which Natural England gives a condition assessment, however, the size of units varies greatly depending on the types of management and the conservation interest.

Features are displayed on the SSSI Impact Zones and Units map on **page 56**

ID: A
 Location: 1348m NE
 SSSI name: Elland Bypass Cutting
 Unit name: Elland Bypass Cutting
 Broad habitat: Earth Heritage
 Condition: Favourable
 Reportable features:

Feature name	Feature condition	Date of assessment
ED - Westphalian	Favourable	11/02/2009

This data is sourced from Natural England and Natural Resources Wales.



11 Visual and cultural designations



- Site Outline
- Search buffers in metres (m)
- Listed buildings
- Conservation areas
- Conservation areas - no data
- National Parks
- Areas of Outstanding Natural Beauty
- Registered parks and gardens
- Scheduled Monuments
- World Heritage Sites

11.1 World Heritage Sites

Records within 250m

0

Sites designated for their globally important cultural or natural interest requiring appropriate management and protection measures. World Heritage Sites are designated to meet the UK's commitments under the World Heritage Convention.

This data is sourced from Historic England, Cadw and Historic Environment Scotland.

11.2 Area of Outstanding Natural Beauty

Records within 250m

0

Areas of Outstanding Natural Beauty (AONB) are conservation areas, chosen because they represent 18% of the finest countryside. Each AONB has been designated for special attention because of the quality of their flora, fauna, historical and cultural associations, and/or scenic views. The National Parks and Access to the Countryside Act of 1949 created AONBs and the Countryside and Rights of Way Act, 2000 added further regulation and protection. There are likely to be restrictions to some developments within these areas.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

11.3 National Parks

Records within 250m

0

In England and Wales, the purpose of National Parks is to conserve and enhance landscapes within the countryside whilst promoting public enjoyment of them and having regard for the social and economic well-being of those living within them. In Scotland National Parks have the additional purpose of promoting the sustainable use of the natural resources of the area and the sustainable social and economic development of its communities. The National Parks and Access to the Countryside Act 1949 established the National Park designation in England and Wales, and The National Parks (Scotland) Act 2000 in Scotland.

This data is sourced from Natural England, Natural Resources Wales and the Scottish Government.

11.4 Listed Buildings

Records within 250m

7

Buildings listed for their special architectural or historical interest. Building control in the form of 'listed building consent' is required in order to make any changes to that building which might affect its special interest. Listed buildings are graded to indicate their relative importance, however building controls apply to all buildings equally, irrespective of their grade, and apply to the interior and exterior of the building in its entirety, together with any curtilage structures.

Features are displayed on the Visual and cultural designations map on **page 58**

ID	Location	Name	Grade	Reference Number	Listed date
1	14m W	C18 Guide Stoop (Signpost) At Junction Of Crosland Road And Lindley Moor Road, Lindley, Kirklees, HD3	II*	1403442	09/08/2011
2	44m SW	Haigh Cross, Lindley, Kirklees, HD3	II	1134307	03/03/1952
3	145m NE	Nos 10, 11 And 12 And Barn Adjoining On North Side, Lindley, Kirklees, HD3	II	1266921	29/09/1978
4	206m NW	7 And 9, Haigh House Hill, Lindley, Kirklees, HD3	II	1134216	29/09/1978
5	208m NW	1 And 1A, Kew Hill, Lindley, Kirklees, HD3	II	1134294	29/09/1978



ID	Location	Name	Grade	Reference Number	Listed date
A	237m E	25 Yew Tree Road, Lindley, Kirklees, HD3	II	1432654	29/09/1978
A	240m E	Yew Tree, Lindley, Kirklees, HD3	II	1432672	29/09/1978

This data is sourced from Historic England, Cadw and Historic Environment Scotland.

11.5 Conservation Areas

Records within 250m

0

Local planning authorities are obliged to designate as conservation areas any parts of their own area that are of special architectural or historic interest, the character and appearance of which it is desirable to preserve or enhance. Designation of a conservation area gives broader protection than the listing of individual buildings. All the features within the area, listed or otherwise, are recognised as part of its character. Conservation area designation is the means of recognising the importance of all factors and of ensuring that planning decisions address the quality of the landscape in its broadest sense.

This data is sourced from Historic England, Cadw and Historic Environment Scotland.

11.6 Scheduled Ancient Monuments

Records within 250m

0

A scheduled monument is an historic building or site that is included in the Schedule of Monuments kept by the Secretary of State for Digital, Culture, Media and Sport. The regime is set out in the Ancient Monuments and Archaeological Areas Act 1979. The Schedule of Monuments has c.20,000 entries and includes sites such as Roman remains, burial mounds, castles, bridges, earthworks, the remains of deserted villages and industrial sites. Monuments are not graded, but all are, by definition, considered to be of national importance.

This data is sourced from Historic England, Cadw and Historic Environment Scotland.

11.7 Registered Parks and Gardens

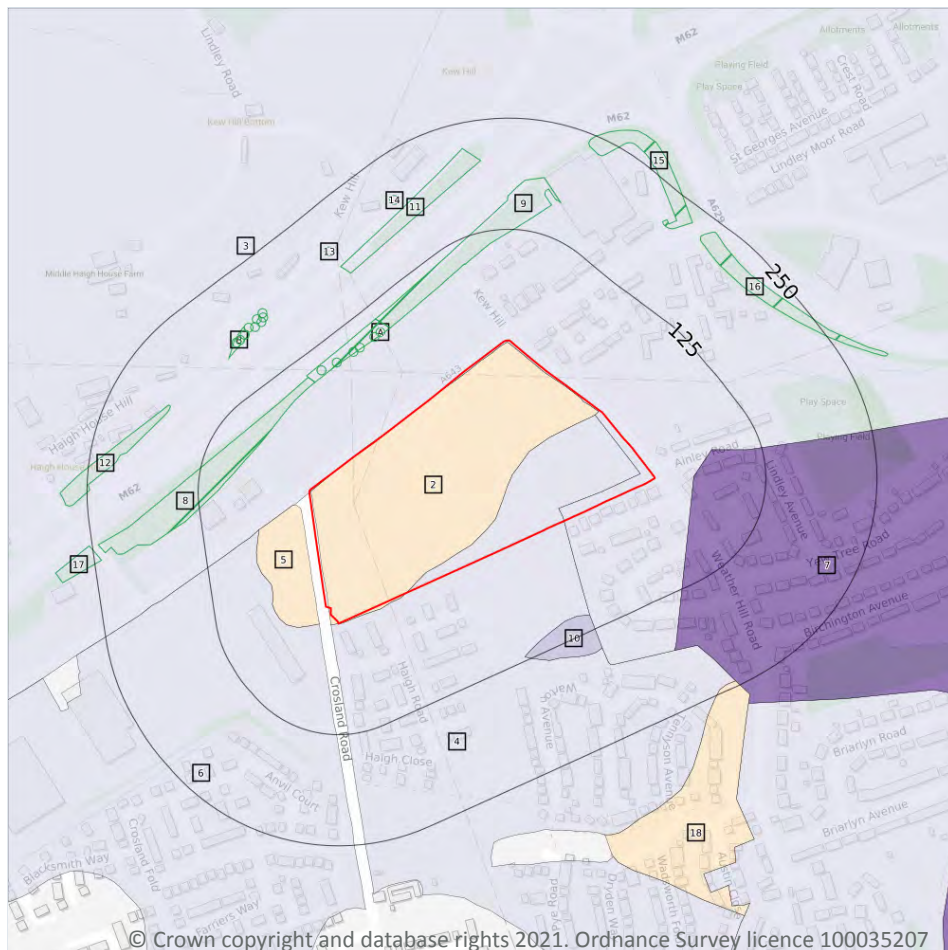
Records within 250m

0

Parks and gardens assessed to be of particular interest and of special historic interest. The emphasis being on 'designed' landscapes, rather than on planting or botanical importance. Registration is a 'material consideration' in the planning process, meaning that planning authorities must consider the impact of any proposed development on the special character of the landscape.

This data is sourced from Historic England, Cadw and Historic Environment Scotland.

12 Agricultural designations



- Site Outline
- Search buffers in metres (m)
- Grade 1 - excellent quality
- Grade 2 - very good quality
- Grade 3 - good to moderate quality
- Grade 3a - good quality
- Grade 3b - moderate quality
- Grade 4 - poor quality
- Grade 5 - very poor quality
- Non-agricultural land
- Urban land
- Exclusion land
- Tree felling licences
- Open Access land

12.1 Agricultural Land Classification

Records within 250m

8

Classification of the quality of agricultural land taking into consideration multiple factors including climate, physical geography and soil properties. It should be noted that the categories for the grading of agricultural land are not consistent across England, Wales and Scotland.

Features are displayed on the Agricultural designations map on **page 61**

ID	Location	Classification	Description
2	On site	Grade 3b	Moderate quality agricultural land. Land capable of producing moderate yields of a narrow range of crops, principally cereals and grass or lower yields of a wider range of crops or high yields of grass which can be grazed or harvested over most of the year.

ID	Location	Classification	Description
3	On site	Grade 4	Poor quality agricultural land. Land with severe limitations which significantly restrict the range of crops and/or level of yields. It is mainly suited to grass with occasional arable crops (e.g. cereals and forage crops) the yields of which are variable. In moist climates, yields of grass may be moderate to high but there may be difficulties in utilisation. The grade also includes very droughty arable land.
4	On site	Grade 4	Poor quality agricultural land. Land with severe limitations which significantly restrict the range of crops and/or level of yields. It is mainly suited to grass with occasional arable crops (e.g. cereals and forage crops) the yields of which are variable. In moist climates, yields of grass may be moderate to high but there may be difficulties in utilisation. The grade also includes very droughty arable land.
5	10m W	Grade 3b	Moderate quality agricultural land. Land capable of producing moderate yields of a narrow range of crops, principally cereals and grass or lower yields of a wider range of crops or high yields of grass which can be grazed or harvested over most of the year.
6	16m SW	Grade 4	Poor quality agricultural land. Land with severe limitations which significantly restrict the range of crops and/or level of yields. It is mainly suited to grass with occasional arable crops (e.g. cereals and forage crops) the yields of which are variable. In moist climates, yields of grass may be moderate to high but there may be difficulties in utilisation. The grade also includes very droughty arable land.
7	44m E	Urban	-
10	103m SE	Grade 5	Very poor quality agricultural land. Land with very severe limitations which restrict use to permanent pasture or rough grazing, except for occasional pioneer forage crops.
18	243m SE	Grade 3b	Moderate quality agricultural land. Land capable of producing moderate yields of a narrow range of crops, principally cereals and grass or lower yields of a wider range of crops or high yields of grass which can be grazed or harvested over most of the year.

This data is sourced from Natural England.

12.2 Open Access Land

Records within 250m

0

The Countryside and Rights of Way Act 2000 (CROW Act) gives a public right of access to land without having to use paths. Access land includes mountains, moors, heaths and downs that are privately owned. It also includes common land registered with the local council and some land around the England Coast Path. Generally permitted activities on access land are walking, running, watching wildlife and climbing.

This data is sourced from Natural England and Natural Resources Wales.



12.3 Tree Felling Licences

Records within 250m

26

Felling Licence Application (FLA) areas approved by Forestry Commission England. Anyone wishing to fell trees must ensure that a licence or permission under a grant scheme has been issued by the Forestry Commission before any felling is carried out or that one of the exceptions apply.

Features are displayed on the Agricultural designations map on **page 61**

ID	Location	Description	Reference	Application date
8	77m NW	Selective Fell/Thin (Unconditional)	018/366/15-16	-
A	89m NW	Single Tree	018/366/15-16	-
A	89m NW	Single Tree	018/366/15-16	-
A	89m NW	Single Tree	018/366/15-16	-
A	90m NW	Single Tree	018/366/15-16	-
9	91m NW	Selective Fell/Thin (Unconditional)	018/366/15-16	-
A	91m NW	Selective Fell/Thin (Unconditional)	018/366/15-16	-
A	92m NW	Single Tree	018/366/15-16	-
A	95m NW	Single Tree	018/366/15-16	-
11	166m NW	Selective Fell/Thin (Unconditional)	018/366/15-16	-
B	173m NW	Selective Fell/Thin (Unconditional)	018/366/15-16	-
B	177m NW	Single Tree	018/366/15-16	-
B	177m NW	Single Tree	018/366/15-16	-
B	178m NW	Single Tree	018/366/15-16	-
B	179m NW	Single Tree	018/366/15-16	-
B	179m NW	Single Tree	018/366/15-16	-
B	182m NW	Single Tree	018/366/15-16	-
B	182m NW	Single Tree	018/366/15-16	-
12	182m NW	Selective Fell/Thin (Unconditional)	018/366/15-16	-
B	184m NW	Single Tree	018/366/15-16	-
B	186m NW	Single Tree	018/366/15-16	-
13	196m NW	Single Tree	018/366/15-16	-
14	196m NW	Single Tree	018/366/15-16	-



ID	Location	Description	Reference	Application date
15	211m NE	Selective Fell/Thin (Unconditional)	018/366/15-16	-
16	211m NE	Selective Fell/Thin (Unconditional)	018/366/15-16	-
17	242m W	Selective Fell/Thin (Unconditional)	018/366/15-16	-

This data is sourced from the Forestry Commission.

12.4 Environmental Stewardship Schemes

Records within 250m

0

Environmental Stewardship covers a range of schemes that provide financial incentives to farmers, foresters and land managers to look after and improve the environment. The schemes identified may be historical schemes that have now expired, or may still be active.

This data is sourced from Natural England.

12.5 Countryside Stewardship Schemes

Records within 250m

1

Countryside Stewardship covers a range of schemes that provide financial incentives to farmers, foresters and land managers to look after and improve the environment. Main objectives are to improve the farmed environment for wildlife and to reduce diffuse water pollution.

Location	Reference	Scheme	Start Date	End Date
221m NW	646742	Countryside Stewardship (Middle Tier)	01/01/2019	31/12/2023

This data is sourced from Natural England.



13 Habitat designations



- Site Outline**
- Search buffers in metres (m)**
- Priority Habitat Inventory
 - Open Mosaic Habitat
 - Limestone Pavement Orders
- Habitat Networks**
- Primary Habitat
 - Restorable Habitat
 - Associated Habitats
 - Habitat Restoration-Creation
 - Network Enhancement Zone 1
 - Network Enhancement Zone 2

13.1 Priority Habitat Inventory

Records within 250m

3

Habitats of principal importance as named under Natural Environment and Rural Communities Act (2006) Section 41.

Features are displayed on the Habitat designations map on **page 65**

ID	Location	Main Habitat	Other habitats
1	94m NW	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
2	97m NE	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
3	97m NW	Deciduous woodland	Main habitat: DWOOD (INV > 50%)

This data is sourced from Natural England.



13.2 Habitat Networks

Records within 250m

0

Habitat networks for 18 priority habitat networks (based primarily, but not exclusively, on the priority habitat inventory) and areas suitable for the expansion of networks through restoration and habitat creation.

This data is sourced from Natural England.

13.3 Open Mosaic Habitat

Records within 250m

0

Sites verified as Open Mosaic Habitat. Mosaic habitats are brownfield sites that are identified under the UK Biodiversity Action Plan as a priority habitat due to the habitat variation within a single site, supporting an array of invertebrates.

This data is sourced from Natural England.

13.4 Limestone Pavement Orders

Records within 250m

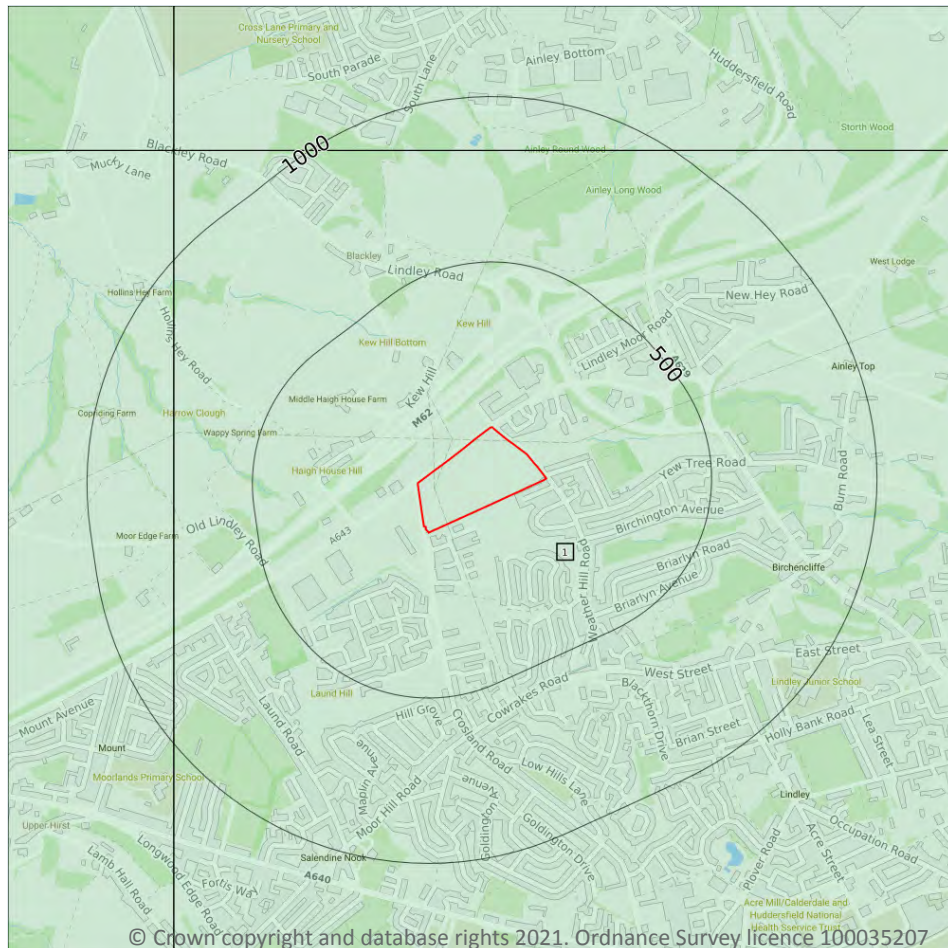
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Limestone pavements are outcrops of limestone where the surface has been worn away by natural means over millennia. These rocks have the appearance of paving blocks, hence their name. Not only do they have geological interest, they also provide valuable habitats for wildlife. These habitats are threatened due to their removal for use in gardens and water features. Many limestone pavements have been designated as SSSIs which affords them some protection. In addition, Section 34 of the Wildlife and Countryside Act 1981 gave them additional protection via the creation of Limestone Pavement Orders, which made it a criminal offence to remove any part of the outcrop. The associated Limestone Pavement Priority Habitat is part of the UK Biodiversity Action Plan priority habitat in England.

This data is sourced from Natural England.



14 Geology 1:10,000 scale - Availability



— Site Outline
Search buffers in metres (m)

- Full coverage
- Partial coverage
- No coverage

14.1 10k Availability

Records within 500m

1

An indication on the coverage of 1:10,000 scale geology data for the site, the most detailed dataset provided by the British Geological Survey. Either 'Full', 'Partial' or 'No coverage' for each geological theme.

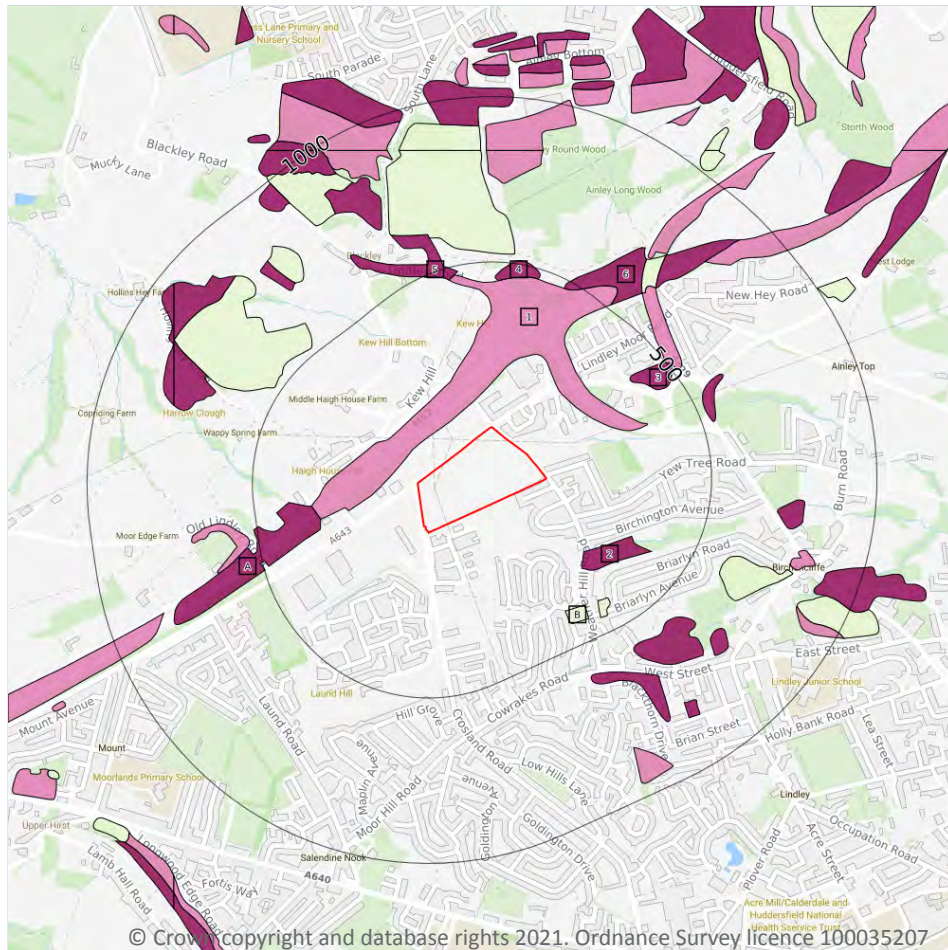
Features are displayed on the Geology 1:10,000 scale - Availability map on **page 67**

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	Full	Full	Full	Full	SE11NW

This data is sourced from the British Geological Survey.



Geology 1:10,000 scale - Artificial and made ground



— Site Outline
Search buffers in metres (m)

- Reclaimed ground
- Made ground
- Worked ground
- Infilled ground
- Disturbed ground
- Landscaped ground

14.2 Artificial and made ground (10k)

Records within 500m

9

Details of made, worked, infilled, disturbed and landscaped ground at 1:10,000 scale. Artificial ground can be associated with potentially contaminated material, unpredictable engineering conditions and instability.

Features are displayed on the Geology 1:10,000 scale - Artificial and made ground map on **page 68**

ID	Location	LEX Code	Description	Rock description
1	76m NW	WGR-VOID	Worked Ground (Undivided)	Void
2	248m SE	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
A	305m W	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
3	384m NE	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit



ID	Location	LEX Code	Description	Rock description
B	387m SE	WMGR-ARTDP	Infilled Ground	Artificial Deposit
B	401m SE	WMGR-ARTDP	Infilled Ground	Artificial Deposit
4	444m N	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
5	464m N	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
6	474m NE	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit

This data is sourced from the British Geological Survey.



Geology 1:10,000 scale - Superficial

14.3 Superficial geology (10k)

Records within 500m

0

Superficial geological deposits at 1:10,000 scale. Also known as 'drift', these are the youngest geological deposits, formed during the Quaternary. They rest on older deposits or rocks referred to as bedrock.

This data is sourced from the British Geological Survey.

14.4 Landslip (10k)

Records within 500m

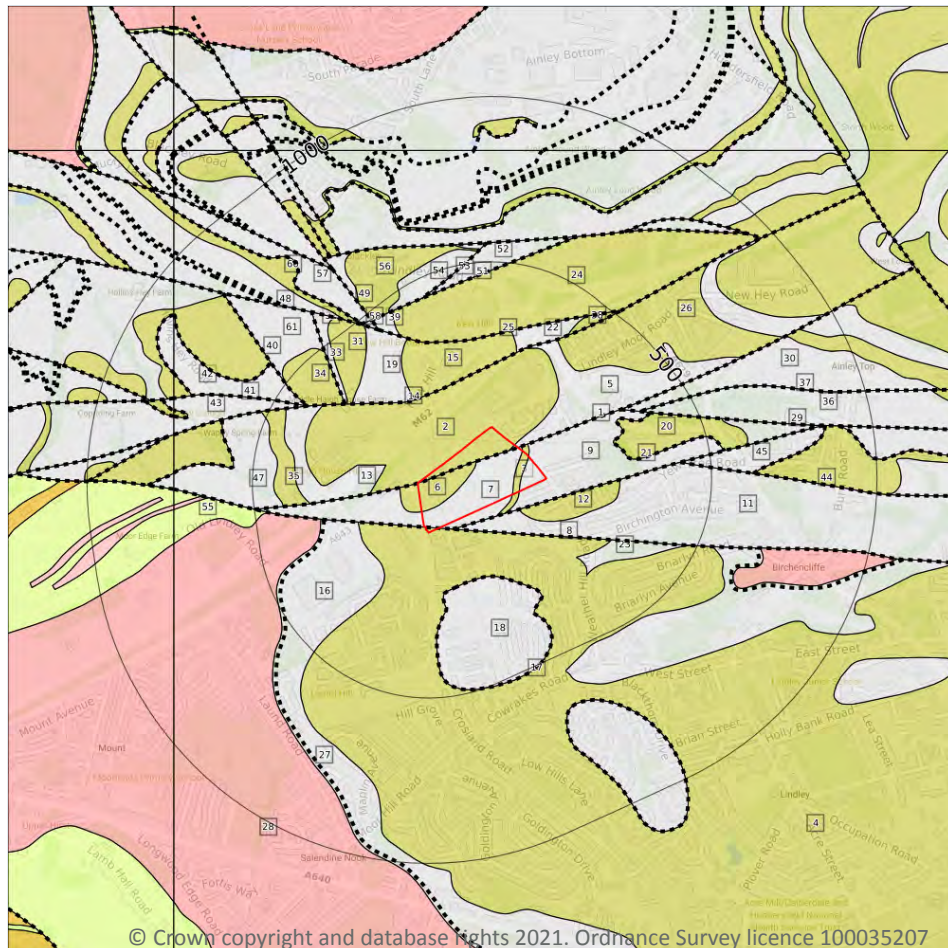
0

Mass movement deposits on BGS geological maps at 1:10,000 scale. Primarily superficial deposits that have moved down slope under gravity to form landslips. These affect bedrock, other superficial deposits and artificial ground.

This data is sourced from the British Geological Survey.



Geology 1:10,000 scale - Bedrock



— Site Outline

Search buffers in metres (m)

.... Bedrock faults and other linear features (10k)

Bedrock geology (10k)
Please see table for more details.

14.5 Bedrock geology (10k)

Records within 500m

40

Bedrock geology at 1:10,000 scale. The main mass of rocks forming the Earth and present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

Features are displayed on the Geology 1:10,000 scale - Bedrock map on **page 71**

ID	Location	LEX Code	Description	Rock age
2	On site	EF-SDST	Elland Flags - Sandstone	Langsettian Sub-age
3	On site	FEYR-SDST	48 Yard Rock - Sandstone	Langsettian Sub-age
4	On site	SBF-SDST	Soft Bed Flags - Sandstone	Langsettian Sub-age

ID	Location	LEX Code	Description	Rock age
5	On site	PLCM-MDSS	Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone	Langsettian Sub-age
6	On site	EYR-SDST	80 Yard Rock - Sandstone	Langsettian Sub-age
7	On site	PLCM-MDSS	Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone	Langsettian Sub-age
9	On site	PLCM-MDSS	Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone	Langsettian Sub-age
11	20m SE	PLCM-MDSS	Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone	Langsettian Sub-age
12	49m SE	STNR-SDST	Stanningley Rock - Sandstone	Langsettian Sub-age
13	111m NW	PLCM-MDSS	Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone	Langsettian Sub-age
15	170m NW	EF-SDST	Elland Flags - Sandstone	Langsettian Sub-age
16	170m SW	PLCM-MDSS	Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone	Langsettian Sub-age
18	184m SE	PLCM-MDSS	Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone	Langsettian Sub-age
19	206m NW	PLCM-MDSS	Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone	Langsettian Sub-age
20	230m NE	STNR-SDST	Stanningley Rock - Sandstone	Langsettian Sub-age
22	238m N	PLCM-MDSS	Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone	Langsettian Sub-age
23	253m SE	PLCM-MDSS	Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone	Langsettian Sub-age
24	272m N	EF-SDST	Elland Flags - Sandstone	Langsettian Sub-age
26	291m NE	EF-SDST	Elland Flags - Sandstone	Langsettian Sub-age
28	305m W	RR-SDST	Rough Rock - Sandstone	Yeadonian Sub-age
30	306m NE	PLCM-MDSS	Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone	Langsettian Sub-age
31	311m NW	EYR-SDST	80 Yard Rock - Sandstone	Langsettian Sub-age
32	320m NW	PLCM-MDSS	Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone	Langsettian Sub-age
34	325m NW	EYR-SDST	80 Yard Rock - Sandstone	Langsettian Sub-age
35	330m W	EYR-SDST	80 Yard Rock - Sandstone	Langsettian Sub-age



ID	Location	LEX Code	Description	Rock age
36	348m NE	PLCM-MDSS	Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone	Langsettian Sub-age
38	361m NE	EF-SDST	Elland Flags - Sandstone	Langsettian Sub-age
39	384m NW	PLCM-MDSS	Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone	Langsettian Sub-age
42	406m NW	PLCM-MDSS	Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone	Langsettian Sub-age
43	406m NW	PLCM-MDSS	Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone	Langsettian Sub-age
45	408m E	PLCM-MDSS	Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone	Langsettian Sub-age
47	412m W	PLCM-MDSS	Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone	Langsettian Sub-age
50	440m NW	PLCM-MDSS	Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone	Langsettian Sub-age
52	441m NW	PLCM-MDSS	Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone	Langsettian Sub-age
54	442m NW	PLCM-MDSS	Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone	Langsettian Sub-age
55	456m W	MG-MDSS	Millstone Grit Group [see Also Migr] - Mudstone, Siltstone And Sandstone	Namurian Age
56	463m NW	EYR-SDST	80 Yard Rock - Sandstone	Langsettian Sub-age
57	477m NW	PLCM-MDSS	Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone	Langsettian Sub-age
60	485m NW	STNR-SDST	Stanningley Rock - Sandstone	Langsettian Sub-age
61	487m NW	PLCM-MDSS	Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone	Langsettian Sub-age

This data is sourced from the British Geological Survey.

14.6 Bedrock faults and other linear features (10k)

Records within 500m

21

Linear features at the ground or bedrock surface at 1:10,000 scale of six main types; rock, fault, fold axis, mineral vein, alteration area or landform. Features are either observed or inferred, and relate primarily to bedrock.

Features are displayed on the Geology 1:10,000 scale - Bedrock map on **page 71**

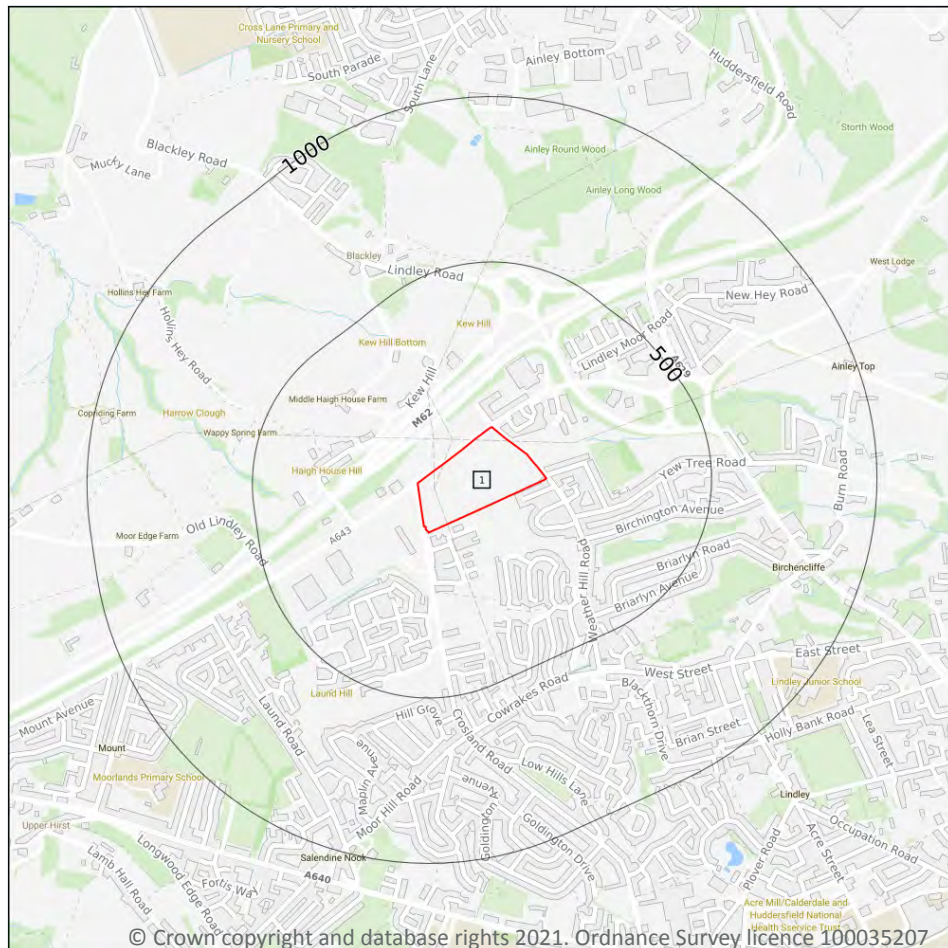


ID	Location	Category	Description
1	On site	FAULT	Normal fault, inferred; crossmarks on downthrow side
8	On site	FAULT	Normal fault, inferred; crossmarks on downthrow side
10	20m SE	FAULT	Normal fault, inferred; crossmarks on downthrow side
14	170m NW	FAULT	Normal fault, inferred; crossmarks on downthrow side
17	184m SE	ROCK	Coal seam, inferred
21	230m NE	ROCK	Coal seam, inferred
25	272m N	FAULT	Normal fault, inferred; crossmarks on downthrow side
27	296m W	FOSSIL_HORIZON	Fossil horizon, marine band
29	306m NE	FAULT	Normal fault, inferred; crossmarks on downthrow side
33	325m NW	FAULT	Normal fault, inferred; crossmarks on downthrow side
37	348m NE	FAULT	Normal fault, inferred; crossmarks on downthrow side
40	406m NW	FAULT	Normal fault, inferred; downthrow not specified
41	406m NW	FAULT	Normal fault, inferred; crossmarks on downthrow side
44	408m E	FAULT	Normal fault, inferred; crossmarks on downthrow side
46	408m E	FAULT	Normal fault, inferred; crossmarks on downthrow side
48	440m NW	FAULT	Normal fault, inferred; crossmarks on downthrow side
49	440m NW	FAULT	Normal fault, inferred; crossmarks on downthrow side
51	441m NW	FAULT	Normal fault, inferred; downthrow not specified
53	442m NW	FAULT	Normal fault, inferred; crossmarks on downthrow side
58	477m NW	FAULT	Normal fault, inferred; downthrow not specified
59	485m NW	ROCK	Coal seam, inferred

This data is sourced from the British Geological Survey.



15 Geology 1:50,000 scale - Availability



— Site Outline

Search buffers in metres (m)

□ Geological map tile

15.1 50k Availability

Records within 500m

1

An indication on the coverage of 1:50,000 scale geology data for the site. Either 'Full' or 'No coverage' for each geological theme.

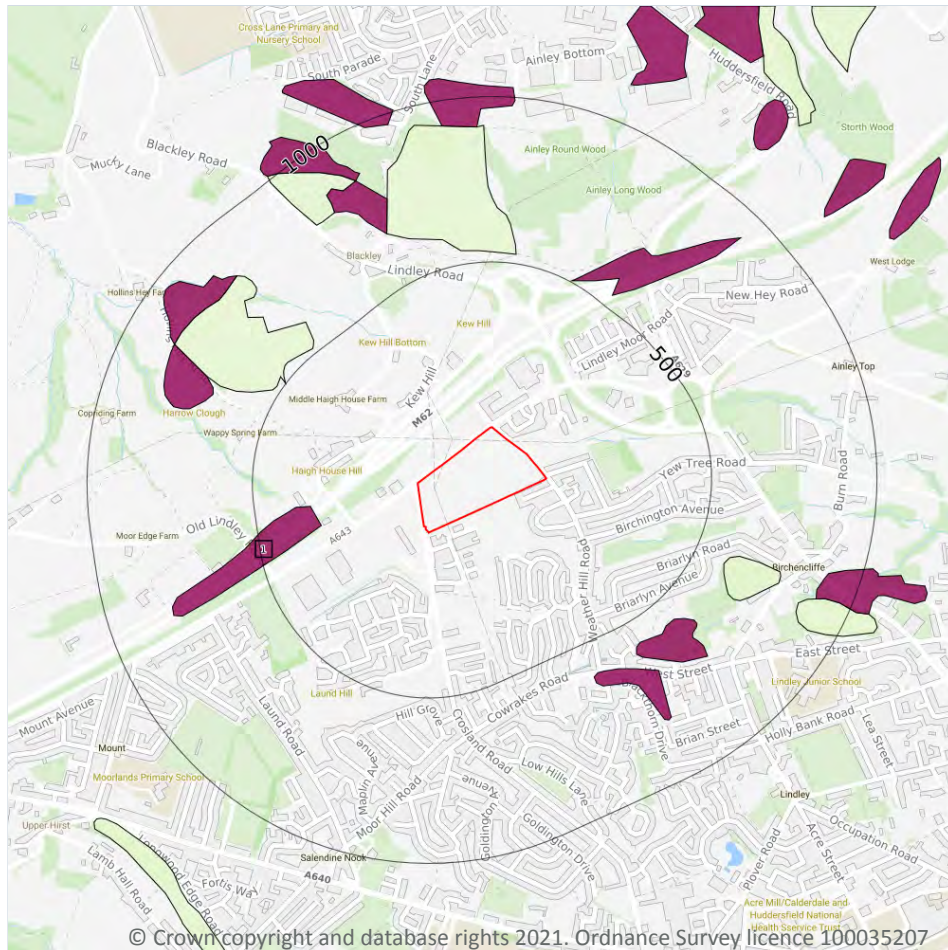
Features are displayed on the Geology 1:50,000 scale - Availability map on **page 75**

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	Full	Full	Full	Full	EW077_huddersfield_v4

This data is sourced from the British Geological Survey.



Geology 1:50,000 scale - Artificial and made ground



- Site Outline**
- Search buffers in metres (m)**
- Made ground
 - Worked ground
 - Infilled ground
 - Disturbed ground
 - Landscaped ground

15.2 Artificial and made ground (50k)

Records within 500m

1

Details of made, worked, infilled, disturbed and landscaped ground at 1:50,000 scale. Artificial ground can be associated with potentially contaminated material, unpredictable engineering conditions and instability.

Features are displayed on the Geology 1:50,000 scale - Artificial and made ground map on **page 76**

ID	Location	LEX Code	Description	Rock description
1	307m W	MGR-ARTDP	MADE GROUND (UNDIVIDED)	ARTIFICIAL DEPOSIT

This data is sourced from the British Geological Survey.

15.3 Artificial ground permeability (50k)

Records within 50m

0

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any artificial deposits (the zone between the land surface and the water table).

This data is sourced from the British Geological Survey.



Geology 1:50,000 scale - Superficial

15.4 Superficial geology (50k)

Records within 500m

0

Superficial geological deposits at 1:50,000 scale. Also known as 'drift', these are the youngest geological deposits, formed during the Quaternary. They rest on older deposits or rocks referred to as bedrock.

This data is sourced from the British Geological Survey.

15.5 Superficial permeability (50k)

Records within 50m

0

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any superficial deposits (the zone between the land surface and the water table).

This data is sourced from the British Geological Survey.

15.6 Landslip (50k)

Records within 500m

0

Mass movement deposits on BGS geological maps at 1:50,000 scale. Primarily superficial deposits that have moved down slope under gravity to form landslips. These affect bedrock, other superficial deposits and artificial ground.

This data is sourced from the British Geological Survey.

15.7 Landslip permeability (50k)

Records within 50m

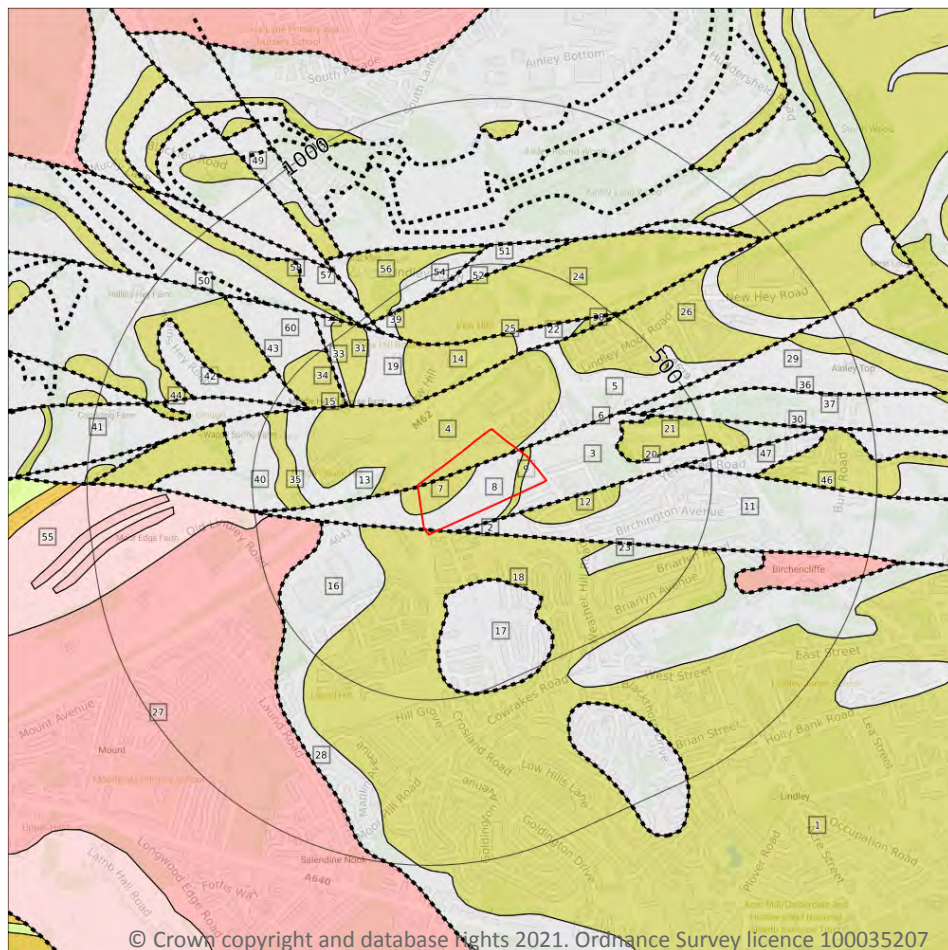
0

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any landslip deposits (the zone between the land surface and the water table).

This data is sourced from the British Geological Survey.



Geology 1:50,000 scale - Bedrock



— Site Outline

Search buffers in metres (m)

.... Bedrock faults and other linear features (50k)

Bedrock geology (50k)
Please see table for more details.

15.8 Bedrock geology (50k)

Records within 500m

40

Bedrock geology at 1:50,000 scale. The main mass of rocks forming the Earth and present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

Features are displayed on the Geology 1:50,000 scale - Bedrock map on **page 79**

ID	Location	LEX Code	Description	Rock age
1	On site	SBF-SDST	SOFT BED FLAGS - SANDSTONE	WESTPHALIAN
3	On site	PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
4	On site	EF-SDST	ELLAND FLAGS - SANDSTONE	WESTPHALIAN



ID	Location	LEX Code	Description	Rock age
5	On site	PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
7	On site	EYR-SDST	80 YARD ROCK - SANDSTONE	WESTPHALIAN
8	On site	PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
9	On site	FEYR-SDST	48 YARD ROCK - SANDSTONE	WESTPHALIAN
11	26m SE	PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
12	54m SE	STNR-SDST	STANNINGLEY ROCK - SANDSTONE	WESTPHALIAN
13	112m W	PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
14	165m NW	EF-SDST	ELLAND FLAGS - SANDSTONE	WESTPHALIAN
16	169m SW	PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
17	186m SE	PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
19	203m NW	PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
21	234m NE	STNR-SDST	STANNINGLEY ROCK - SANDSTONE	WESTPHALIAN
22	238m N	PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
23	259m SE	PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
24	274m N	EF-SDST	ELLAND FLAGS - SANDSTONE	WESTPHALIAN
26	294m NE	EF-SDST	ELLAND FLAGS - SANDSTONE	WESTPHALIAN
27	303m W	RR-SDST	ROUGH ROCK - SANDSTONE	NAMURIAN
29	306m NE	PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
31	310m NW	EYR-SDST	80 YARD ROCK - SANDSTONE	WESTPHALIAN
32	314m NW	PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
34	321m NW	EYR-SDST	80 YARD ROCK - SANDSTONE	WESTPHALIAN
35	322m W	EYR-SDST	80 YARD ROCK - SANDSTONE	WESTPHALIAN



ID	Location	LEX Code	Description	Rock age
37	346m NE	PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
38	364m NE	EF-SDST	ELLAND FLAGS - SANDSTONE	WESTPHALIAN
39	381m NW	PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
40	396m W	PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
41	400m NW	PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
42	400m NW	PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
47	408m E	PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
48	437m NW	PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
51	439m N	PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
54	442m NW	PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
55	455m W	ROSSE-MDSI	ROSSENDALE FORMATION - MUDSTONE AND SILTSTONE	NAMURIAN
56	463m NW	EYR-SDST	80 YARD ROCK - SANDSTONE	WESTPHALIAN
57	475m NW	PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
58	483m NW	STNR-SDST	STANNINGLEY ROCK - SANDSTONE	WESTPHALIAN
60	486m NW	PLCM-MDSS	PENNINE LOWER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN

This data is sourced from the British Geological Survey.

15.9 Bedrock permeability (50k)

Records within 50m

5

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of bedrock (the zone between the land surface and the water table).



Location	Flow type	Maximum permeability	Minimum permeability
On site	Fracture	High	Moderate
On site	Fracture	High	Moderate
On site	Fracture	High	Moderate
On site	Fracture	High	Moderate
On site	Fracture	High	Low

This data is sourced from the British Geological Survey.

15.10 Bedrock faults and other linear features (50k)

Records within 500m	20
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Linear features at the ground or bedrock surface at 1:50,000 scale of six main types; rock, fault, fold axis, mineral vein, alteration area or landform. Features are either observed or inferred, and relate primarily to bedrock.

Features are displayed on the Geology 1:50,000 scale - Bedrock map on **page 79**

ID	Location	Category	Description
2	On site	FAULT	Fault, inferred
6	On site	FAULT	Fault, inferred
10	26m SE	FAULT	Fault, inferred
15	165m NW	FAULT	Fault, inferred
18	186m SE	ROCK	Coal seam, inferred
20	234m NE	ROCK	Coal seam, inferred
25	274m N	FAULT	Fault, inferred
28	303m W	FOSSIL_HORIZON	Marine band
30	306m NE	FAULT	Fault, inferred
33	321m NW	FAULT	Fault, inferred
36	346m NE	FAULT	Fault, inferred
43	400m NW	FAULT	Fault, inferred
44	400m NW	FAULT	Fault, inferred
45	408m E	FAULT	Fault, inferred
46	408m E	FAULT	Fault, inferred



ID	Location	Category	Description
49	437m NW	FAULT	Fault, inferred
50	437m NW	FAULT	Fault, inferred
52	439m N	FAULT	Fault, inferred, displacement unknown
53	442m NW	FAULT	Fault, inferred
59	483m NW	ROCK	Coal seam, inferred

This data is sourced from the British Geological Survey.



[illegible]

- Confidential
- 0 - 10m
- 10 - 30m
- 30m+
- Unknown

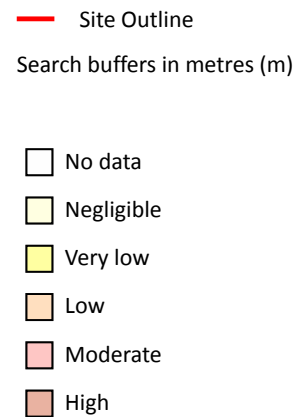
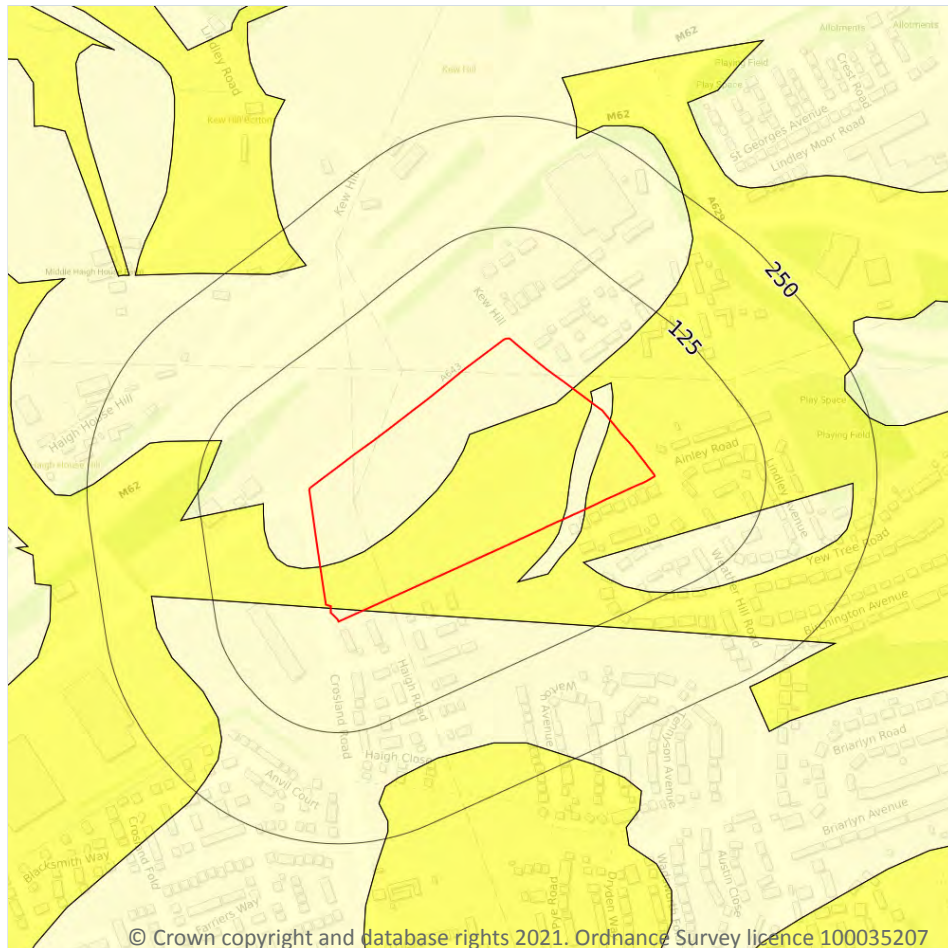
84

ID	Location	Grid reference	Name	Length	Confidential	Web link
4	142m NW	410800 419220	LANCASHIRE YORKSHIRE MWAY CONTRACT E 64	3.04	N	18572812
5	143m NW	410760 419190	LANCASHIRE YORKSHIRE MWAY CONTRACT E 63	4.57	N	18572810
6	149m NW	410840 419260	LANCASHIRE YORKSHIRE MWAY CONTRACT E 65	3.04	N	18572813
7	187m N	410970 419350	LANCASHIRE YORKSHIRE MWAY CONTRACT E 71	6.09	N	18572816
8	188m W	410550 419000	LANCASHIRE YORKSHIRE MWAY CONTRACT E 60	15.24	N	18572806
9	205m N	411020 419360	LANCASHIRE YORKSHIRE MWAY CONTRACT E 71A	18.28	N	18572817
10	207m NW	410870 419350	LANCASHIRE YORKSHIRE MWAY CONTRACT E 69	3.04	N	18573558
A	223m W	410520 418940	LANCASHIRE YORKSHIRE MWAY CONTRACT E 59A	15.24	N	18572804
B	230m NE	411200 419270	LANCASHIRE YORKSHIRE MWAY CONTRACT E 83	15.24	N	18573498
B	240m NE	411190 419290	LANCASHIRE YORKSHIRE MWAY CONTRACT E 82	21.33	N	18573497
11	244m N	411050 419390	LANCASHIRE YORKSHIRE MWAY CONTRACT E 72	16.76	N	18572818
A	244m W	410500 418930	LANCASHIRE YORKSHIRE MWAY CONTRACT E 59	30.78	N	18573492
12	246m NE	411280 419210	LANCASHIRE YORKSHIRE MWAY CONTRACT E 88	12.19	N	18573519

This data is sourced from the British Geological Survey.



17 Natural ground subsidence - Shrink swell clays



17.1 Shrink swell clays

Records within 50m

2

The potential hazard presented by soils that absorb water when wet (making them swell), and lose water as they dry (making them shrink). This shrink-swell behaviour is controlled by the type and amount of clay in the soil, and by seasonal changes in the soil moisture content (related to rainfall and local drainage).

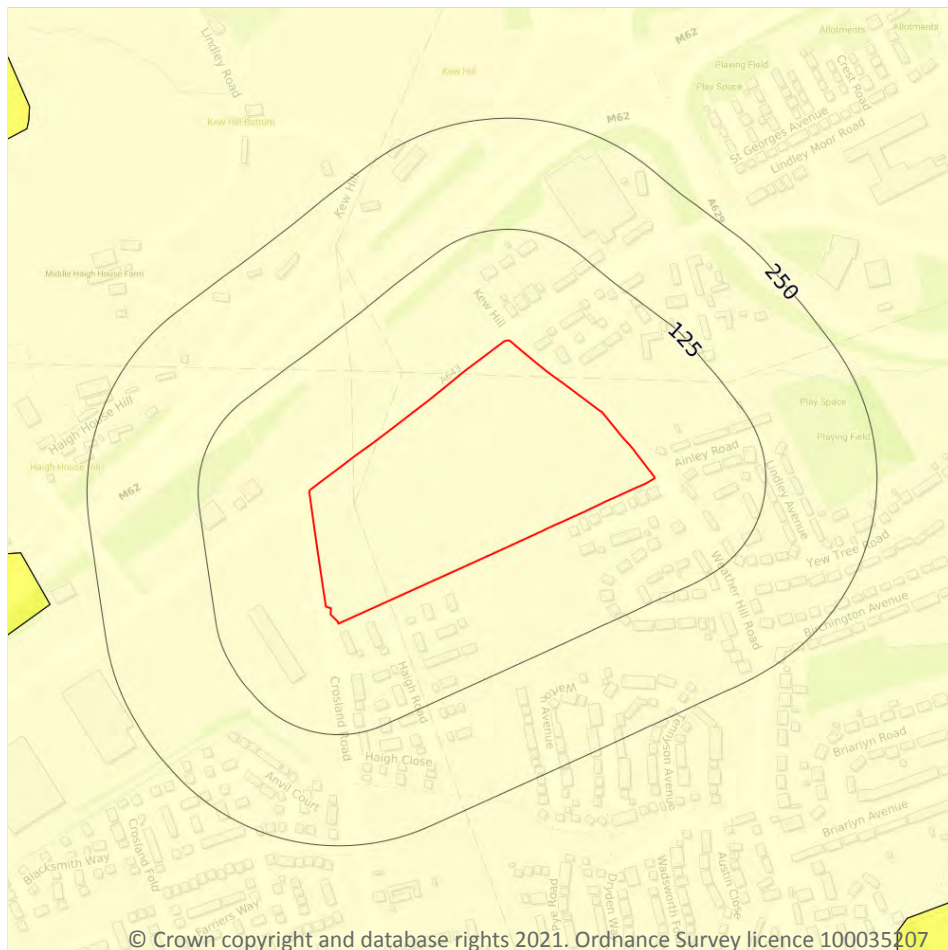
Features are displayed on the Natural ground subsidence - Shrink swell clays map on **page 86**

Location	Hazard rating	Details
On site	Negligible	Ground conditions predominantly non-plastic.
On site	Very low	Ground conditions predominantly low plasticity.

This data is sourced from the British Geological Survey.



Natural ground subsidence - Running sands



— Site Outline
Search buffers in metres (m)

- ☐ No data
- ☐ Negligible
- ☐ Very low
- ☐ Low
- ☐ Moderate
- ☐ High

17.2 Running sands

Records within 50m

1

The potential hazard presented by rocks that can contain loosely-packed sandy layers that can become fluidised by water flowing through them. Such sands can 'run', removing support from overlying buildings and causing potential damage.

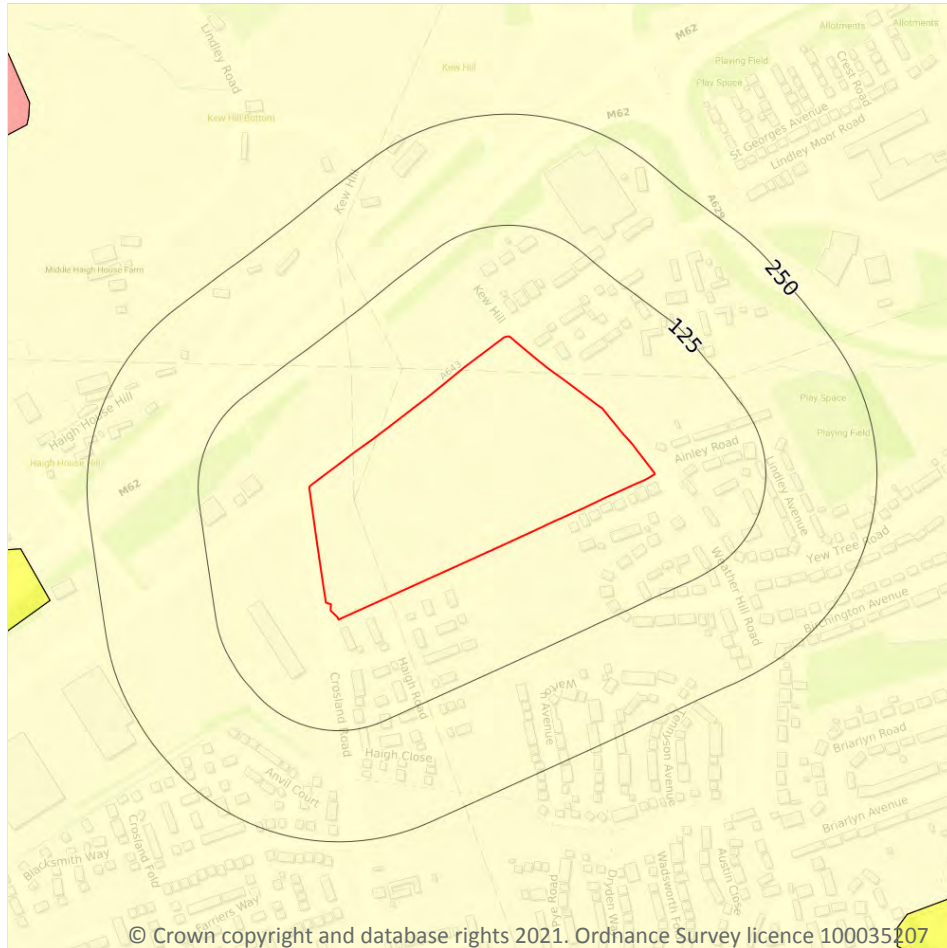
Features are displayed on the Natural ground subsidence - Running sands map on **page 87**

Location	Hazard rating	Details
On site	Negligible	Running sand conditions are not thought to occur whatever the position of the water table. No identified constraints on lands use due to running conditions.

This data is sourced from the British Geological Survey.



Natural ground subsidence - Compressible deposits



- Site Outline**
- Search buffers in metres (m)**
- ☐ No data
 - ☐ Negligible
 - ☐ Very low
 - ☐ Low
 - ☐ Moderate
 - ☐ High

17.3 Compressible deposits

Records within 50m

1

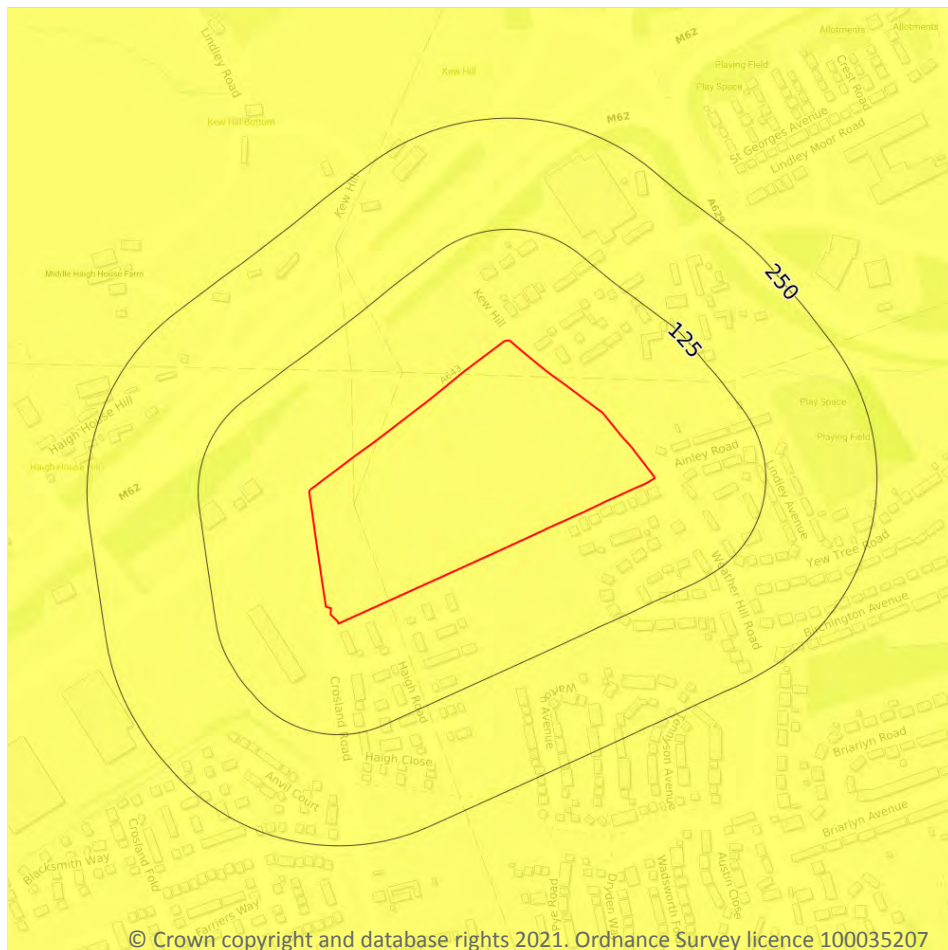
The potential hazard presented by types of ground that may contain layers of very soft materials like clay or peat and may compress if loaded by overlying structures, or if the groundwater level changes, potentially resulting in depression of the ground and disturbance of foundations.

Features are displayed on the Natural ground subsidence - Compressible deposits map on **page 88**

Location	Hazard rating	Details
On site	Negligible	Compressible strata are not thought to occur.

This data is sourced from the British Geological Survey.

Natural ground subsidence - Collapsible deposits



- Site Outline
- Search buffers in metres (m)
- ☐ No data
 - ☐ Negligible
 - ☐ Very low
 - ☐ Low
 - ☐ Moderate
 - ☐ High

17.4 Collapsible deposits

Records within 50m

1

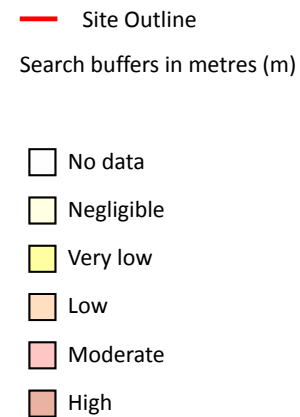
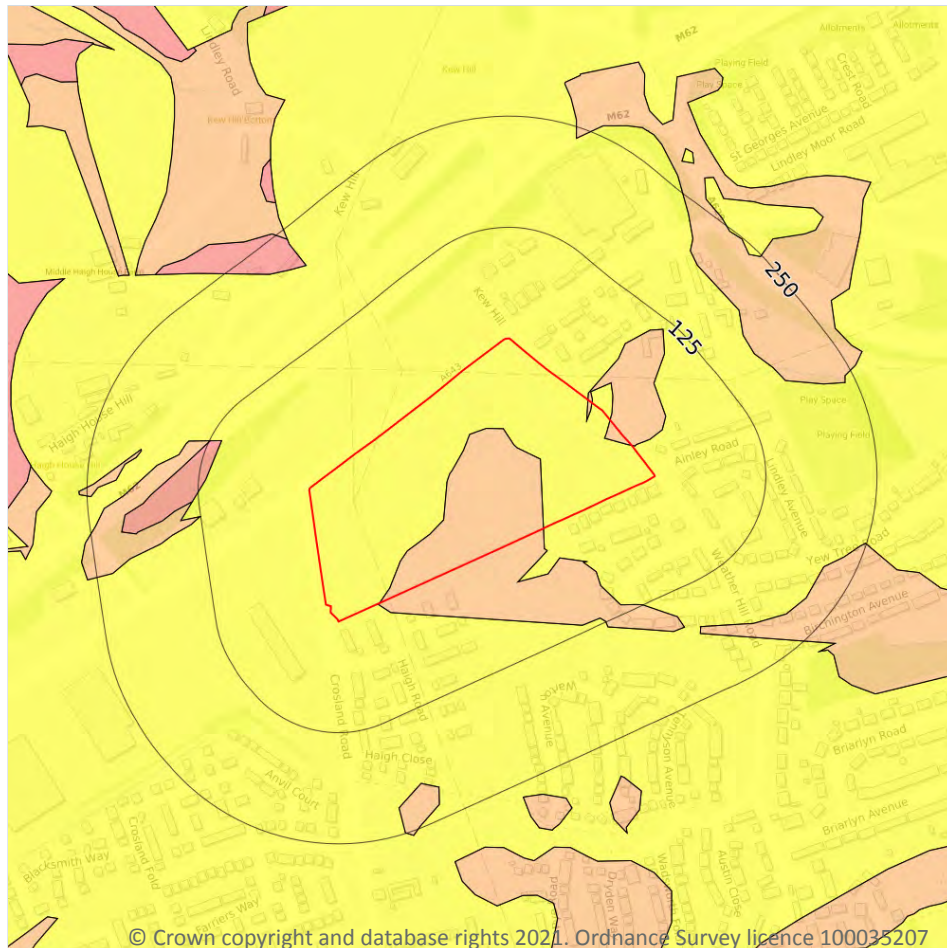
The potential hazard presented by natural deposits that could collapse when a load (such as a building) is placed on them or they become saturated with water.

Features are displayed on the Natural ground subsidence - Collapsible deposits map on **page 89**

Location	Hazard rating	Details
On site	Very low	Deposits with potential to collapse when loaded and saturated are unlikely to be present.

This data is sourced from the British Geological Survey.

Natural ground subsidence - Landslides



17.5 Landslides

Records within 50m

2

The potential for landsliding (slope instability) to be a hazard assessed using 1:50,000 scale digital maps of superficial and bedrock deposits, combined with information from the BGS National Landslide Database and scientific and engineering reports.

Features are displayed on the Natural ground subsidence - Landslides map on **page 90**

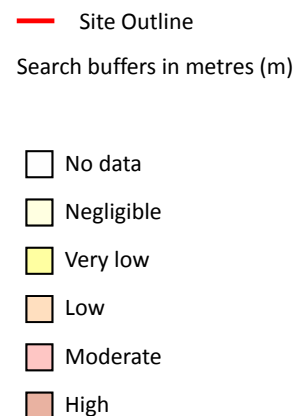
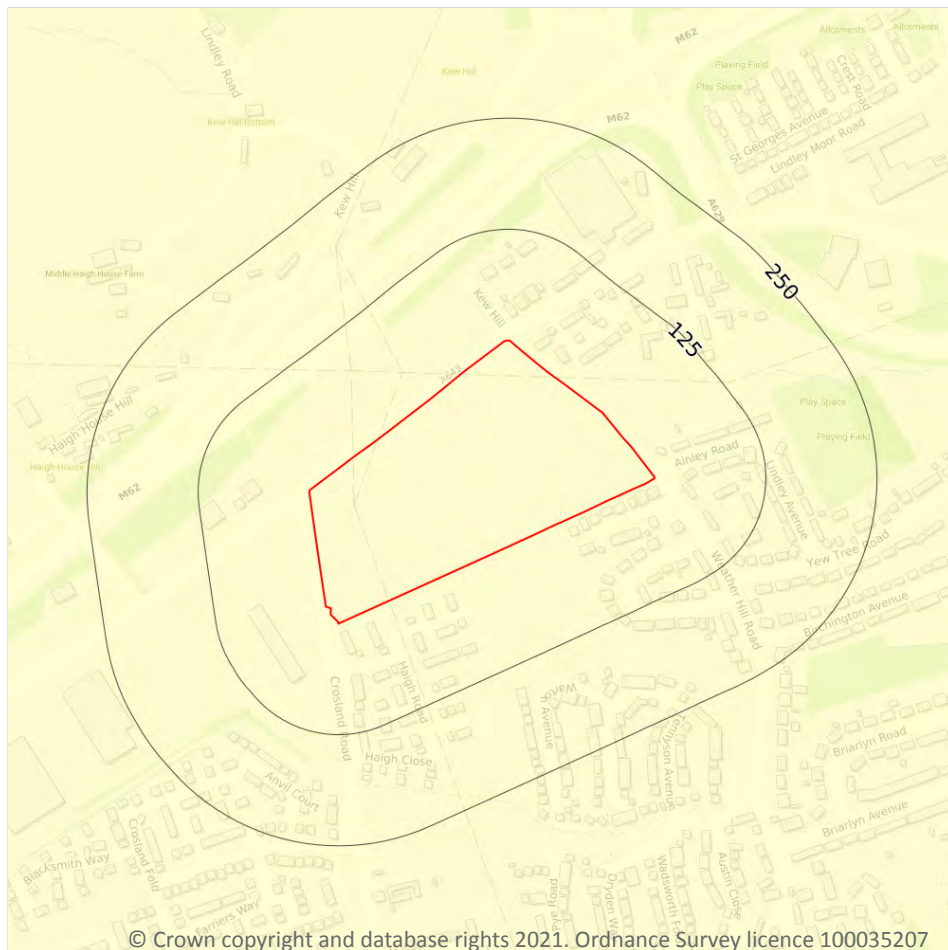
Location	Hazard rating	Details
On site	Very low	Slope instability problems are not likely to occur but consideration to potential problems of adjacent areas impacting on the site should always be considered.

Location	Hazard rating	Details
On site	Low	Slope instability problems may be present or anticipated. Site investigation should consider specifically the slope stability of the site.

This data is sourced from the British Geological Survey.



Natural ground subsidence - Ground dissolution of soluble rocks



17.6 Ground dissolution of soluble rocks

Records within 50m

1

The potential hazard presented by ground dissolution, which occurs when water passing through soluble rocks produces underground cavities and cave systems. These cavities reduce support to the ground above and can cause localised collapse of the overlying rocks and deposits.

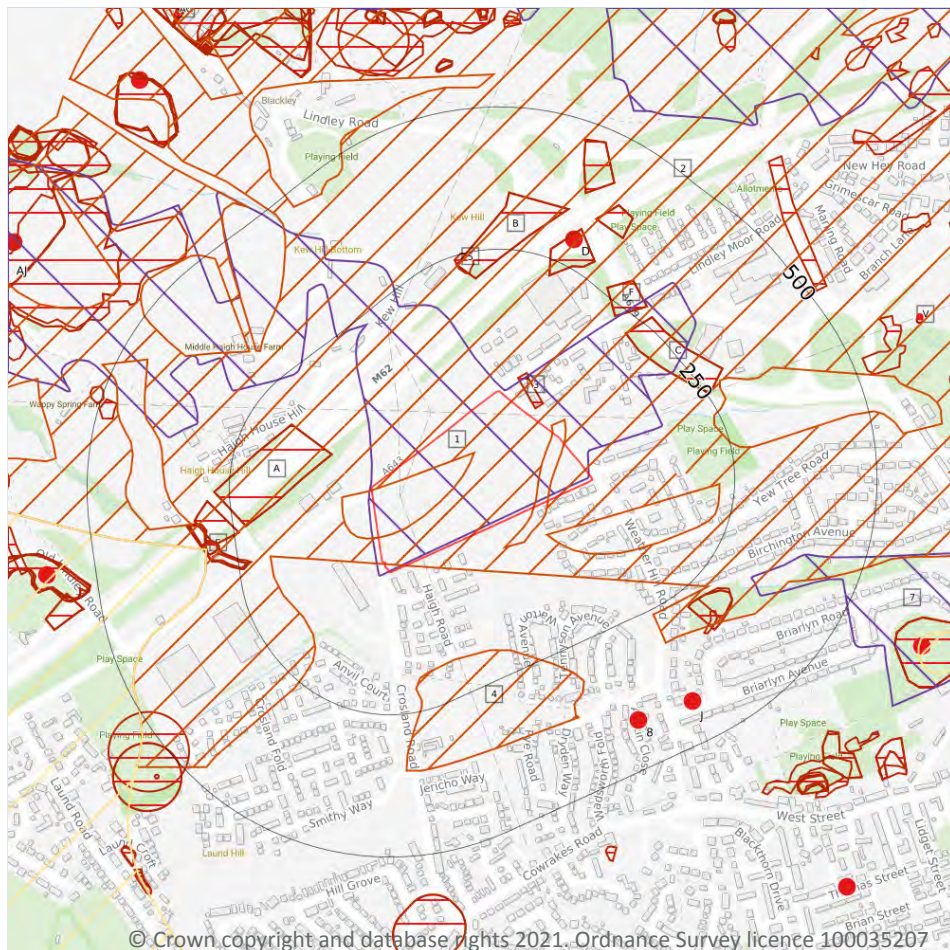
Features are displayed on the Natural ground subsidence - Ground dissolution of soluble rocks map on **page 92**

Location	Hazard rating	Details
On site	Negligible	Soluble rocks are either not thought to be present within the ground, or not prone to dissolution. Dissolution features are unlikely to be present.

This data is sourced from the British Geological Survey.



18 Mining, ground workings and natural cavities



- Site Outline
- Search buffers in metres (m)
- ▢ Natural cavities (Area)
- Natural cavities (Point)
- BritPits
- ▢ Surface ground workings
- ▢ Underground workings
- ▨ Historical Mineral Planning Areas
- Mining Cavities
- Non Coal Mining
- ▨ Sporadic underground mining of restricted extent possible
- ▨ Localised small scale underground mining possible
- ▨ Small scale mining possible
- ▨ Underground mining known or likely within or in close proximity
- ▨ Underground mining known within or in very close proximity

18.1 Natural cavities

Records within 500m

0

Industry recognised national database of natural cavities. Sinkholes and caves are formed by the dissolution of soluble rock, such as chalk and limestone, gulls and fissures by cambering. Ground instability can result from movement of loose material contained within these cavities, often triggered by water.

This data is sourced from Stantec UK Ltd.

18.2 BritPits

Records within 500m

4

BritPits (an abbreviation of British Pits) is a database maintained by the British Geological Survey of currently active and closed surface and underground mineral workings. Details of major mineral handling sites, such as wharfs and rail depots are also held in the database.

Features are displayed on the Mining, ground workings and natural cavities map on **page 93**

ID	Location	Details	Description
D	297m NE	Name: Adkin Flats Colliery Address: Brackley, ELLAND, West Yorkshire Commodity: Coal, Deep Status: Ceased	Type: Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots) Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority
8	417m SE	Name: Weather Hill Quarries Address: Weather Hill, Birchencliffe, HUDDERSFIELD, West Yorkshire Commodity: Sandstone Status: Ceased	Type: A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority
J	426m SE	Name: Weather Hill Quarries Address: Weather Hill, Birchencliffe, HUDDERSFIELD, West Yorkshire Commodity: Sandstone Status: Ceased	Type: A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority
J	445m SE	Name: Weather Hill Quarries Address: Weather Hill, Birchencliffe, HUDDERSFIELD, West Yorkshire Commodity: Sandstone Status: Ceased	Type: A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority

This data is sourced from the British Geological Survey.



18.3 Surface ground workings

Records within 250m

17

Historical land uses identified from Ordnance Survey mapping that involved ground excavation at the surface. These features may or may not have been subsequently backfilled.

Features are displayed on the Mining, ground workings and natural cavities map on **page 93**

ID	Location	Land Use	Year of mapping	Mapping scale
3	17m NE	Cuttings	1892	1:10560
A	91m NW	Cuttings	1985	1:10000
A	91m NW	Cuttings	1975	1:10000
B	203m N	Cuttings	1985	1:10000
B	203m N	Cuttings	1975	1:10000
C	207m NE	Cuttings	1985	1:10000
C	207m NE	Cuttings	1975	1:10000
5	213m N	Unspecified Pit	1891	1:10560
D	222m NE	Cuttings	1985	1:10000
D	222m NE	Cuttings	1975	1:10000
E	228m W	Unspecified Quarry	1956	1:10560
F	230m NE	Cuttings	1985	1:10000
F	230m NE	Cuttings	1975	1:10000
E	231m W	Unspecified Quarry	1948	1:10560
E	237m W	Cuttings	1930	1:10560
E	242m W	Cuttings	1985	1:10000
E	242m W	Cuttings	1975	1:10000

This data is sourced from Ordnance Survey/Groundsure.

18.4 Underground workings

Records within 1000m

17

Historical land uses identified from Ordnance Survey mapping that indicate the presence of underground workings e.g. mine shafts.

Features are displayed on the Mining, ground workings and natural cavities map on **page 93**



ID	Location	Land Use	Year of mapping	Mapping scale
V	634m NE	Unspecified Disused Shaft	1966	1:10560
V	638m NE	Unspecified Old Shaft	1930	1:10560
V	640m NE	Unspecified Old Shaft	1951	1:10560
AG	864m NW	Unspecified Shaft	1930	1:10560
AG	865m NW	Unspecified Shaft	1951	1:10560
-	885m NE	Air Shaft	1930	1:10560
-	885m NE	Air Shaft	1975	1:10000
-	885m NE	Air Shaft	1951	1:10560
-	885m NE	Air Shaft	1966	1:10560
-	914m NW	Unspecified Shaft	1905	1:10560
-	914m NW	Air Shaft	1930	1:10560
-	915m NW	Air Shaft	1951	1:10560
-	963m SE	Unspecified Shaft	1905	1:10560
-	974m NE	Unspecified Disused Shaft	1969	1:10560
-	994m NE	Unspecified Old Level	1951	1:10560
-	995m NE	Unspecified Old Level	1930	1:10560
-	1000m NE	Unspecified Level	1951	1:10560

This data is sourced from Ordnance Survey/Groundsure.

18.5 Historical Mineral Planning Areas

Records within 500m

2

Boundaries of mineral planning permissions for England and Wales. This data was collated between the 1940s (and retrospectively to the 1930s) and the mid 1980s. The data includes permitted, withdrawn and refused permissions.

Features are displayed on the Mining, ground workings and natural cavities map on **page 93**

ID	Location	Site Name	Mineral	Type	Planning Status	Planning Status Date
1	On site	Pea Wood Fireclay Mine	Shale	Mineral working is partly on the surface and partly underground	Valid	3/195



ID	Location	Site Name	Mineral	Type	Planning Status	Planning Status Date
7	328m SE	Birchenccliffe	Brickearth	Surface mineral working	Valid	11/11/48

This data is sourced from the British Geological Survey.

18.6 Non-coal mining

Records within 1000m

11

The potential for historical non-coal mining to have affected an area. The assessment is drawn from expert knowledge and literature in addition to the digital geological map of Britain. Mineral commodities may be divided into seven general categories - vein minerals, chalk, oil shale, building stone, bedded ores, evaporites and 'other' commodities (including ball clay, jet, black marble, graphite and chert).

Features are displayed on the Mining, ground workings and natural cavities map on **page 93**

ID	Location	Name	Commodity	Class	Likelihood
2	On site	Elland Flag Mines	Sandstone - Elland Flags	D	Underground mining is known or considered likely to have occurred within or close to the area. Potential for difficult ground conditions are at a level where they should be considered
4	186m SE	Elland Flag Mines	Sandstone - Elland Flags	D	Underground mining is known or considered likely to have occurred within or close to the area. Potential for difficult ground conditions are at a level where they should be considered
6	303m W	Not available	Vein Mineral	A	Sporadic underground mining of restricted extent may have occurred. Potential for difficult ground conditions are unlikely and localised and are at a level where they need not be considered
14	642m SE	Not available	Vein Mineral	A	Sporadic underground mining of restricted extent may have occurred. Potential for difficult ground conditions are unlikely and localised and are at a level where they need not be considered
-	738m W	Elland Flag Mines	Sandstone - Elland Flags	D	Underground mining is known or considered likely to have occurred within or close to the area. Potential for difficult ground conditions are at a level where they should be considered
-	738m W	Not available	Vein Mineral	A	Sporadic underground mining of restricted extent may have occurred. Potential for difficult ground conditions are unlikely and localised and are at a level where they need not be considered



ID	Location	Name	Commodity	Class	Likelihood
-	752m W	Elland Flag Mines	Sandstone - Elland Flags	D	Underground mining is known or considered likely to have occurred within or close to the area. Potential for difficult ground conditions are at a level where they should be considered
-	772m W	Elland Flag Mines	Sandstone - Elland Flags	D	Underground mining is known or considered likely to have occurred within or close to the area. Potential for difficult ground conditions are at a level where they should be considered
-	804m NW	Elland Flag Mines	Sandstone - Elland Flags	D	Underground mining is known or considered likely to have occurred within or close to the area. Potential for difficult ground conditions are at a level where they should be considered
-	837m N	Elland Flag Mines	Sandstone - Elland Flags	D	Underground mining is known or considered likely to have occurred within or close to the area. Potential for difficult ground conditions are at a level where they should be considered
-	850m W	Elland Flag Mines	Sandstone - Elland Flags	D	Underground mining is known or considered likely to have occurred within or close to the area. Potential for difficult ground conditions are at a level where they should be considered

This data is sourced from the British Geological Survey.

18.7 Mining cavities

Records within 1000m	4
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Industry recognised national database of mining cavities. Degraded mines may result in hazardous subsidence (crown holes). Climatic conditions and water escape can also trigger subsidence over mine entrances and workings.

Features are displayed on the Mining, ground workings and natural cavities map on **page 93**

ID	Location	Mine Address	Mineral	Data source	Publisher
-	754m N	Woodman, West Yorkshire	Clay	LISTING OF NEW MINERAL RECORDS OFFICE CATALOGUE.	UNPUBLISHED/DRAFT
AJ	756m NW	Pea Wood, West Yorkshire	Shale	MINERAL PLANNING RIGHTS APPLICATION RECORDS.	UNPUBLISHED
-	912m NE	Robinsons, West Yorkshire	Clay	LISTING OF NEW MINERAL RECORDS OFFICE CATALOGUE.	UNPUBLISHED/DRAFT
-	925m NW	Blackley And Woodman, West Yorkshire	Clay	LISTING OF NEW MINERAL RECORDS OFFICE CATALOGUE.	UNPUBLISHED/DRAFT



This data is sourced from Stantec UK Ltd.

18.8 JPB mining areas

Records on site	0
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Areas which could be affected by former coal and other mining. This data includes some mine plans unavailable to the Coal Authority.

This data is sourced from Johnson Poole and Bloomer.

18.9 Coal mining

Records on site	1
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Areas which could be affected by past, current or future coal mining.

Location	Details
On site	The site is located within a coal mining area as defined by the Coal Authority. A Consultants Coal Mining Report is recommended to further assess coal mining issues at the site. This can be ordered directly through Groundsure or your preferred search provider.

This data is sourced from the Coal Authority.

18.10 Brine areas

Records on site	0
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The Cheshire Brine Compensation District indicates areas that may be affected by salt and brine extraction in Cheshire and where compensation would be available where damage from this mining has occurred. Damage from salt and brine mining can still occur outside this district, but no compensation will be available.

This data is sourced from the Cheshire Brine Subsidence Compensation Board.

18.11 Gypsum areas

Records on site	0
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Generalised areas that may be affected by gypsum extraction.

This data is sourced from British Gypsum.

18.12 Tin mining

Records on site	0
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Generalised areas that may be affected by historical tin mining.

This data is sourced from Mining Searches UK.

18.13 Clay mining

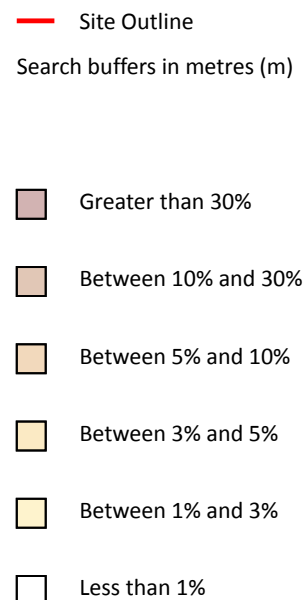
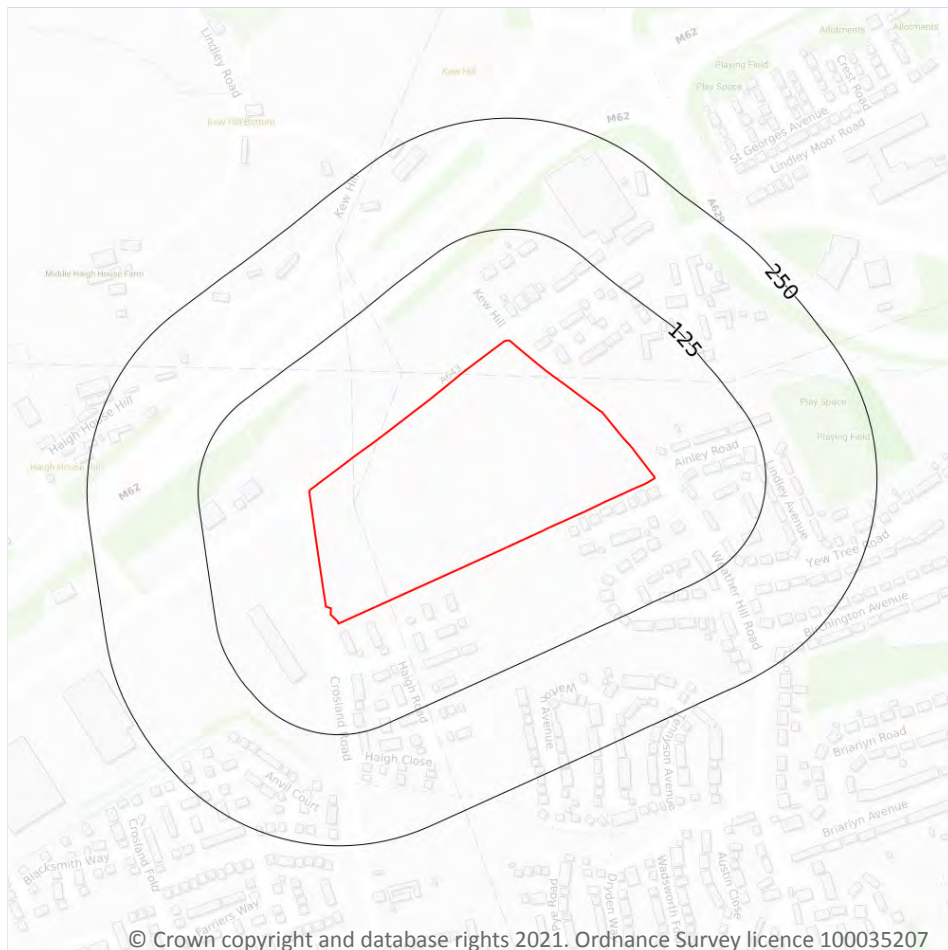
Records on site	0
-----------------	---

Generalised areas that may be affected by kaolin and ball clay extraction.

This data is sourced from the Kaolin and Ball Clay Association (UK).



19 Radon



19.1 Radon

Records on site

1

Estimated percentage of dwellings exceeding the Radon Action Level. This data is the highest resolution radon dataset available for the UK and is produced to a 75m level of accuracy to allow for geological data accuracy and a 'residential property' buffer. The findings of this section should supersede any estimations derived from the Indicative Atlas of Radon in Great Britain. The data was derived from both geological assessments and long term measurements of radon in more than 479,000 households.

Features are displayed on the Radon map on **page 101**

Location	Estimated properties affected	Radon Protection Measures required
On site	Less than 1%	None**

This data is sourced from the British Geological Survey and Public Health England.



20 Soil chemistry

20.1 BGS Estimated Background Soil Chemistry

Records within 50m

18

The estimated values provide the likely background concentration of the potentially harmful elements Arsenic, Cadmium, Chromium, Lead and Nickel in topsoil. The values are estimated primarily from rural topsoil data collected at a sample density of approximately 1 per 2 km². In areas where rural soil samples are not available, estimation is based on stream sediment data collected from small streams at a sampling density of 1 per 2.5 km²; this is the case for most of Scotland, Wales and southern England. The stream sediment data are converted to soil-equivalent concentrations prior to the estimation.

Location	Arsenic	Bioaccessible Arsenic	Lead	Bioaccessible Lead	Cadmium	Chromium	Nickel
On site	25 - 35 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	90 - 120 mg/kg	15 - 30 mg/kg
On site	25 - 35 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	90 - 120 mg/kg	15 - 30 mg/kg
On site	25 - 35 mg/kg	No data	100 - 200 mg/kg	60 - 120 mg/kg	1.8 mg/kg	90 - 120 mg/kg	15 - 30 mg/kg
On site	25 - 35 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	90 - 120 mg/kg	15 - 30 mg/kg
On site	25 - 35 mg/kg	No data	100 - 200 mg/kg	60 - 120 mg/kg	1.8 mg/kg	90 - 120 mg/kg	15 - 30 mg/kg
On site	25 - 35 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	90 - 120 mg/kg	15 - 30 mg/kg
On site	25 - 35 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	90 - 120 mg/kg	15 - 30 mg/kg
On site	25 - 35 mg/kg	No data	100 - 200 mg/kg	60 - 120 mg/kg	1.8 mg/kg	90 - 120 mg/kg	15 - 30 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	>180 mg/kg	30 - 45 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	>180 mg/kg	30 - 45 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	>180 mg/kg	30 - 45 mg/kg
On site	15 mg/kg	No data	100 - 200 mg/kg	60 - 120 mg/kg	1.8 mg/kg	>180 mg/kg	30 - 45 mg/kg



Location	Arsenic	Bioaccessible Arsenic	Lead	Bioaccessible Lead	Cadmium	Chromium	Nickel
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	>180 mg/kg	30 - 45 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	>180 mg/kg	30 - 45 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	>180 mg/kg	30 - 45 mg/kg
26m S	15 mg/kg	No data	100 - 200 mg/kg	60 - 120 mg/kg	1.8 mg/kg	>180 mg/kg	30 - 45 mg/kg
27m SE	25 - 35 mg/kg	No data	100 - 200 mg/kg	60 - 120 mg/kg	1.8 mg/kg	90 - 120 mg/kg	15 - 30 mg/kg
48m E	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	>180 mg/kg	30 - 45 mg/kg

This data is sourced from the British Geological Survey.

20.2 BGS Estimated Urban Soil Chemistry

Records within 50m

0

Estimated topsoil chemistry of Arsenic, Cadmium, Chromium, Copper, Nickel, Lead, Tin and Zinc and bioaccessible Arsenic and Lead in 23 urban centres across Great Britain. These estimates are derived from interpolation of the measured urban topsoil data referred to above and provide information across each city between the measured sample locations (4 per km²).

This data is sourced from the British Geological Survey.

20.3 BGS Measured Urban Soil Chemistry

Records within 50m

0

The locations and measured total concentrations (mg/kg) of Arsenic, Cadmium, Chromium, Copper, Nickel, Lead, Tin and Zinc in urban topsoil samples from 23 urban centres across Great Britain. These are collected at a sample density of 4 per km².

This data is sourced from the British Geological Survey.



21 Railway infrastructure and projects

21.1 Underground railways (London)

Records within 250m**0**

Details of all active London Underground lines, including approximate tunnel roof depth and operational hours.

This data is sourced from publicly available information by Groundsure.

21.2 Underground railways (Non-London)

Records within 250m**0**

Details of the Merseyrail system, the Tyne and Wear Metro and the Glasgow Subway. Not all parts of all systems are located underground. The data contains location information only and does not include a depth assessment.

This data is sourced from publicly available information by Groundsure.

21.3 Railway tunnels

Records within 250m**0**

Railway tunnels taken from contemporary Ordnance Survey mapping.

This data is sourced from the Ordnance Survey.

21.4 Historical railway and tunnel features

Records within 250m**0**

Railways and tunnels digitised from historical Ordnance Survey mapping as scales of 1:1,250, 1:2,500, 1:10,000 and 1:10,560.

This data is sourced from Ordnance Survey/Groundsure.

21.5 Royal Mail tunnels

Records within 250m**0**

The Post Office Railway, otherwise known as the Mail Rail, is an underground railway running through Central London from Paddington Head District Sorting Office to Whitechapel Eastern Head Sorting Office. The line is 10.5km long. The data includes details of the full extent of the tunnels, the depth of the tunnel, and the depth to track level.



This data is sourced from Groundsure/the Postal Museum.

21.6 Historical railways

Records within 250m

0

Former railway lines, including dismantled lines, abandoned lines, disused lines, historic railways and razed lines.

This data is sourced from OpenStreetMap.

21.7 Railways

Records within 250m

0

Currently existing railway lines, including standard railways, narrow gauge, funicular, trams and light railways.

This data is sourced from Ordnance Survey and OpenStreetMap.

21.8 Crossrail 1

Records within 500m

0

The Crossrail railway project links 41 stations over 100 kilometres from Reading and Heathrow in the west, through underground sections in central London, to Shenfield and Abbey Wood in the east.

This data is sourced from publicly available information by Groundsure.

21.9 Crossrail 2

Records within 500m

0

Crossrail 2 is a proposed railway linking the national rail networks in Surrey and Hertfordshire via an underground tunnel through London.

This data is sourced from publicly available information by Groundsure.

21.10 HS2

Records within 500m

0

HS2 is a proposed high speed rail network running from London to Manchester and Leeds via Birmingham. Main civils construction on Phase 1 (London to Birmingham) of the project began in 2019, and it is currently anticipated that this phase will be fully operational by 2026. Construction on Phase 2a (Birmingham to Crewe) is anticipated to commence in 2021, with the service fully operational by 2027. Construction on Phase 2b (Crewe to Manchester and Birmingham to Leeds) is scheduled to begin in 2023 and be operational by 2033.

This data is sourced from HS2 Ltd.



Data providers

Groundsure works with respected data providers to bring you the most relevant and accurate information. To find out who they are and their areas of expertise see <https://www.groundsure.com/sources-reference>.

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Site Details:

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Client Ref: MWA_7768
Report Ref: GS-8157479
Grid Ref: 410932, 419004

Map Name: County Series

Map date: 1854

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1850
Revised N/A
Edition 1854
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Levelled 1853

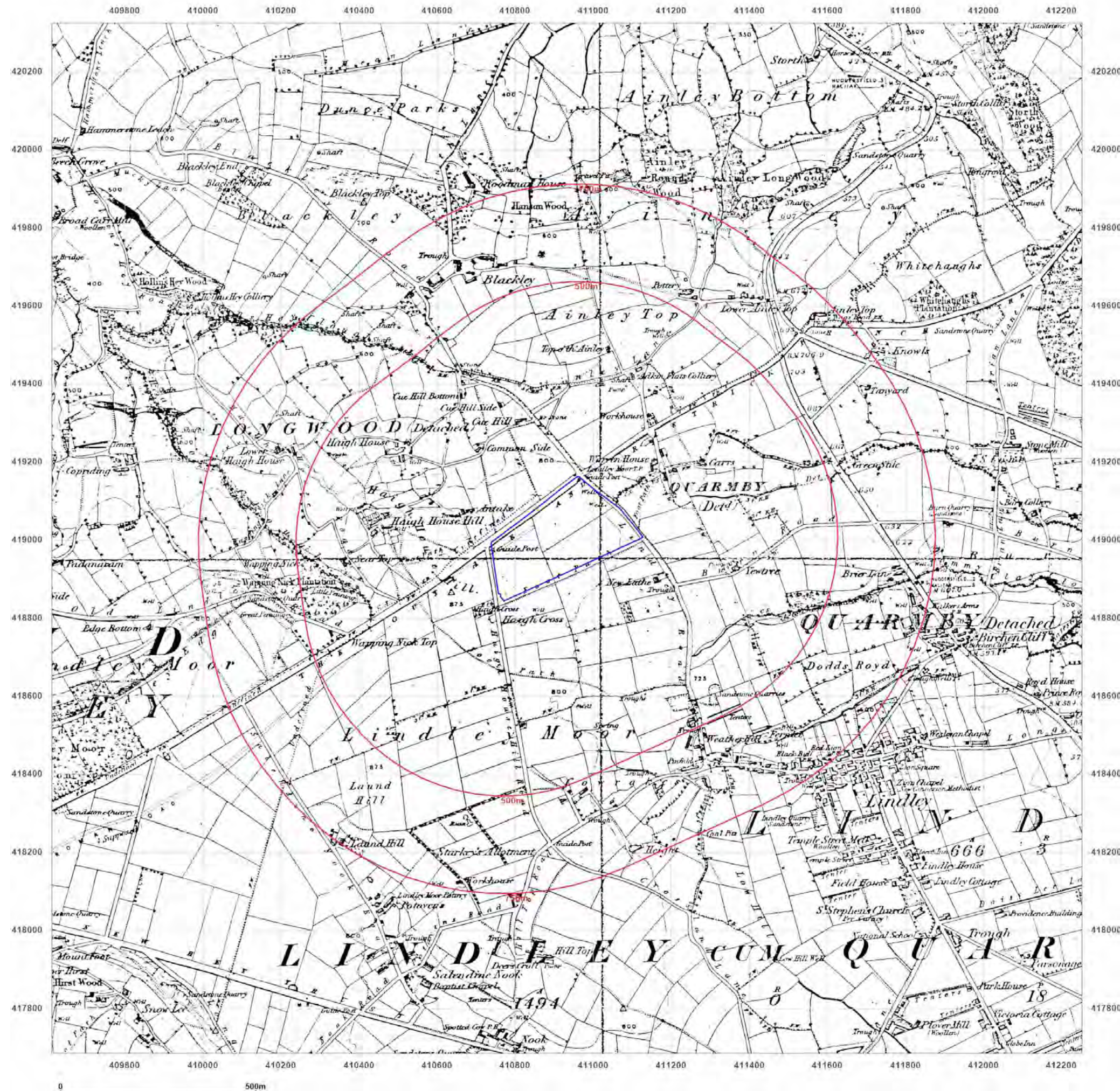


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Client Ref: MWA_7768
Report Ref: GS-8157479
Grid Ref: 410932, 419004

Map Name: County Series

Map date: 1890-1892

Scale: 1:10,560

Printed at: 1:10,560



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Edition N/A
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Surveyed 1890
Revised 1890
Edition N/A
Copyright N/A
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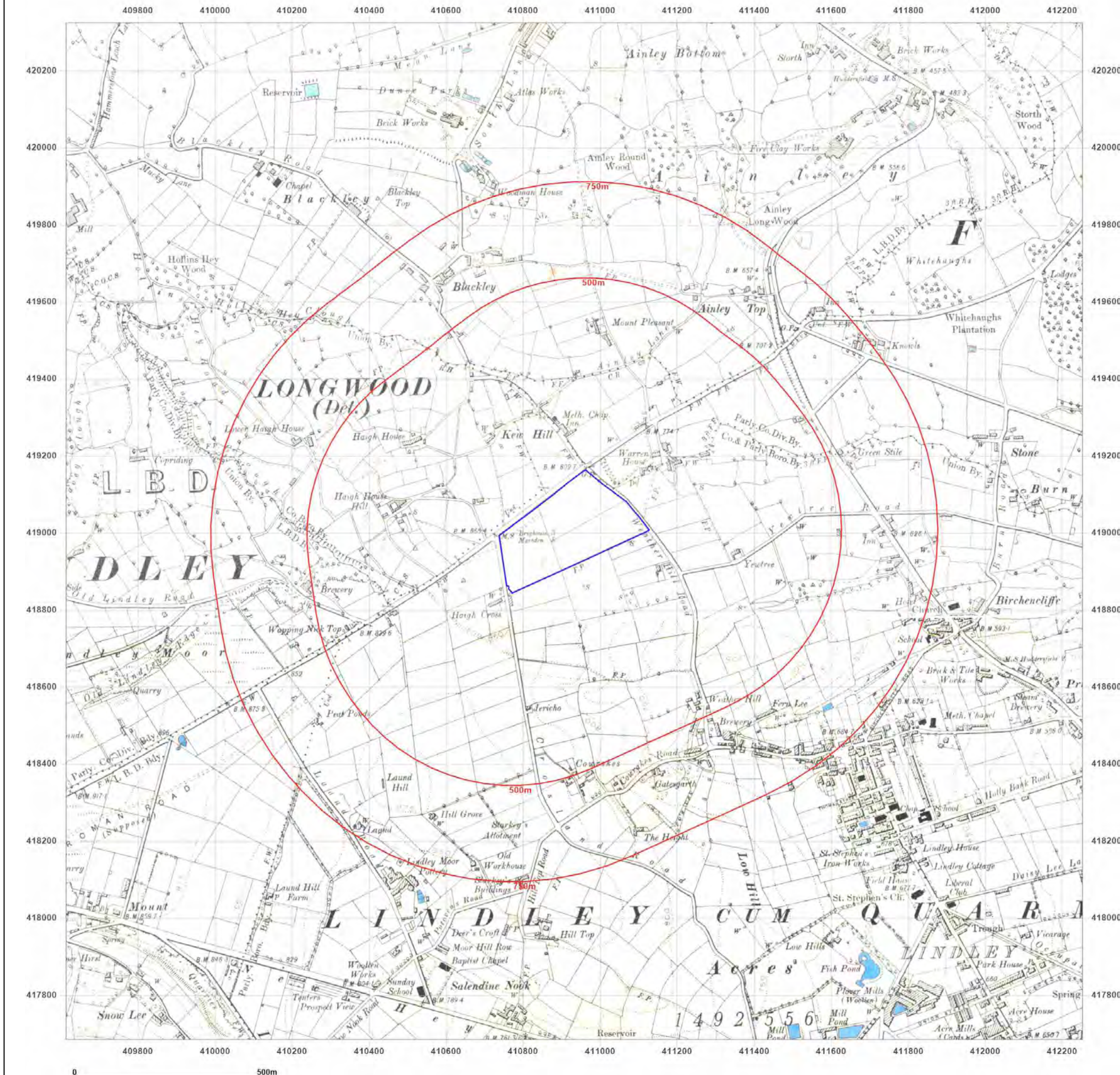


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Client Ref: MWA_7768
Report Ref: GS-8157479
Grid Ref: 410932, 419004

Map Name: County Series

Map date: 1905

Scale: 1:10,560

Printed at: 1:10,560



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Surveyed 1890
Revised 1905
Edition N/A
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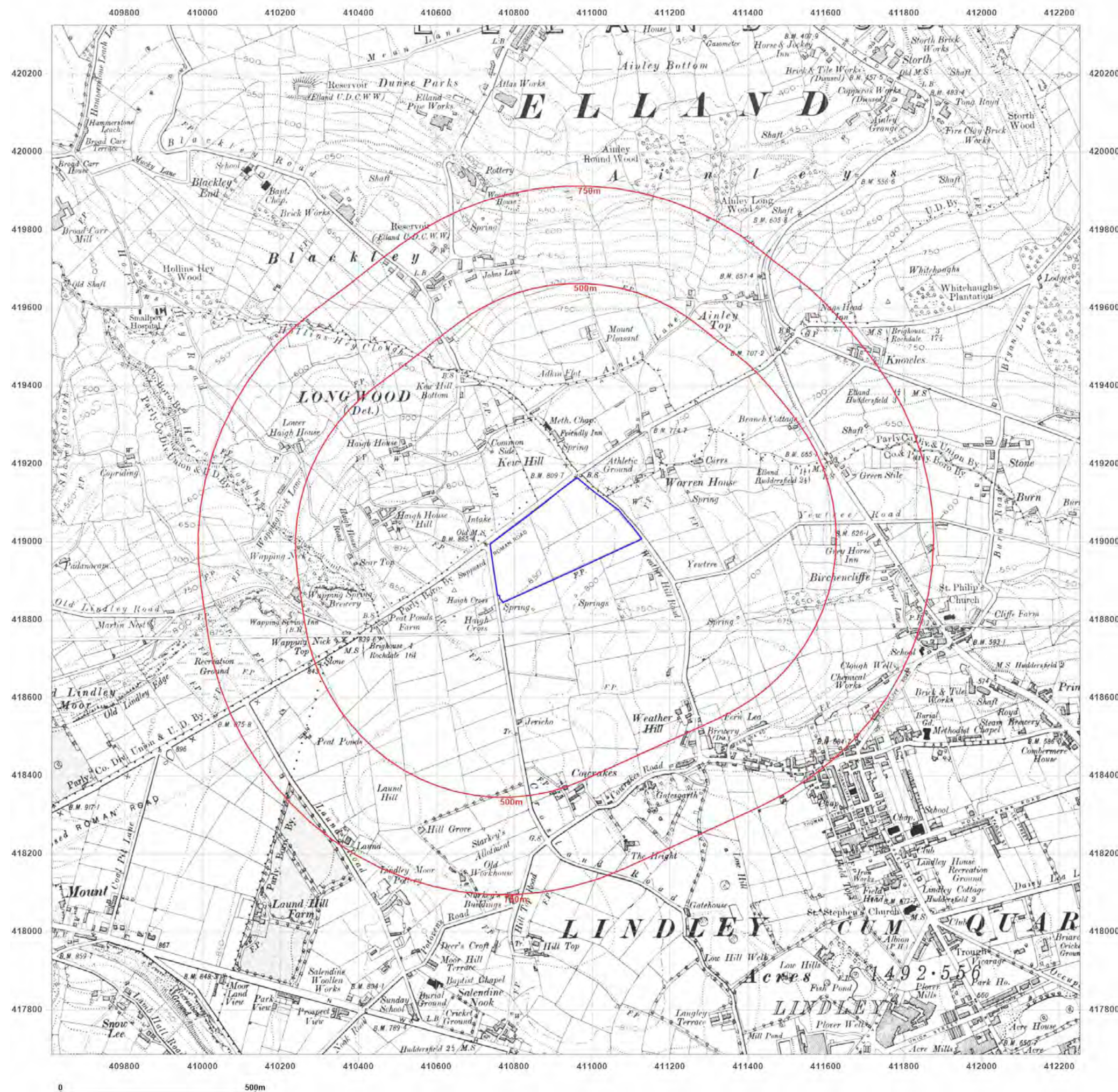


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Client Ref: MWA_7768
Report Ref: GS-8157479
Grid Ref: 410932, 419004

Map Name: County Series

Map date: 1930

Scale: 1:10,560

Printed at: 1:10,560



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Revised 1930
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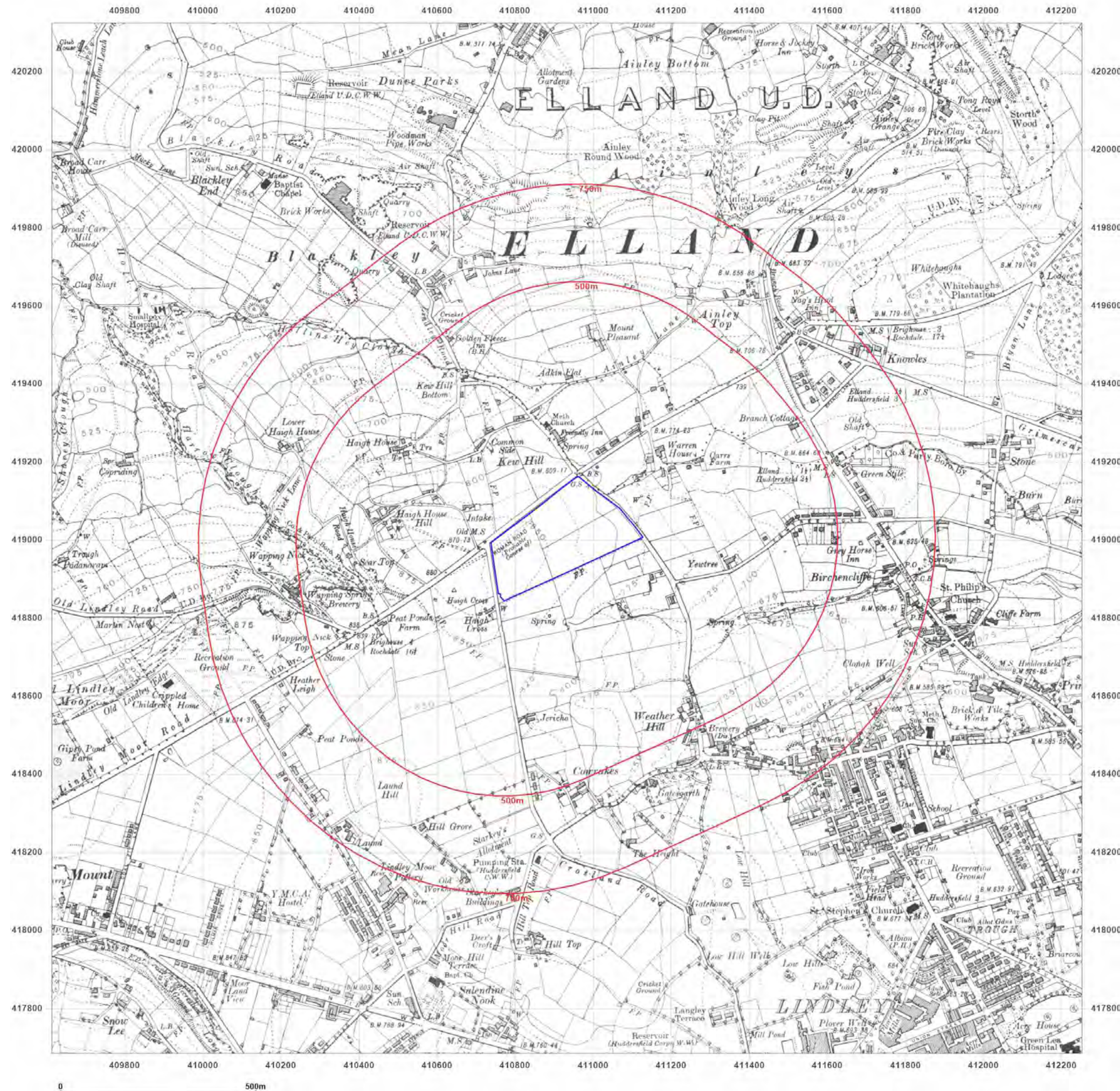


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Client Ref: MWA_7768
Report Ref: GS-8157479
Grid Ref: 410932, 419004

Map Name: County Series

Map date: 1948

Scale: 1:10,560

Printed at: 1:10,560



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Client Ref: MWA_7768
Report Ref: GS-8157479
Grid Ref: 410932, 419004

Map Name: Provisional

Map date: 1955-1956

Scale: 1:10,560

Printed at: 1:10,560



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Edition N/A
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Surveyed N/A
Revised 1955
Edition N/A
Copyright N/A
Levelled N/A

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Revised 1955
Edition N/A
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Surveyed 1951
Revised 1951
Edition N/A
Copyright 1956
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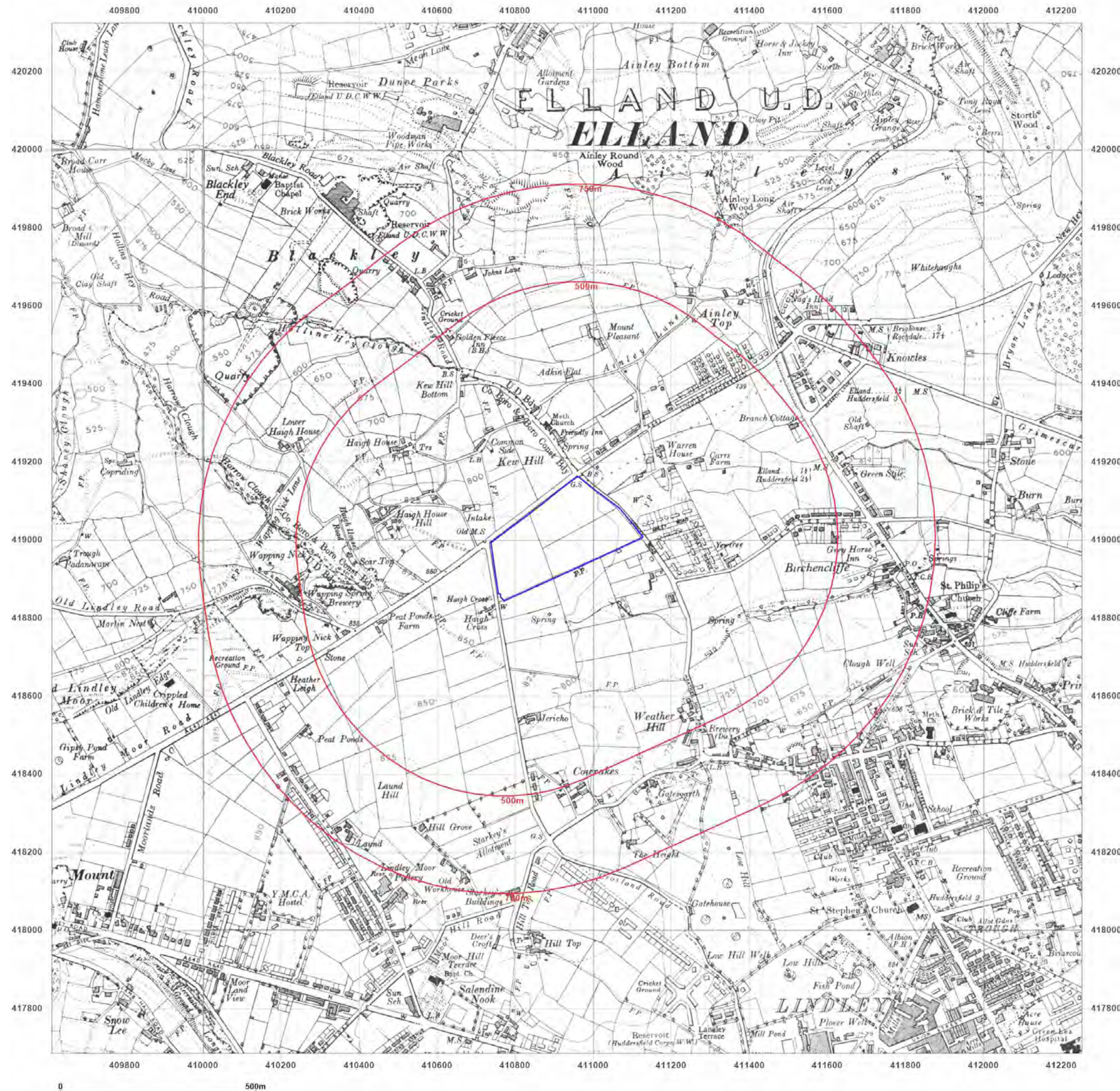


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Client Ref: MWA_7768
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Grid Ref: 410932, 419004

Map Name: Provisional

Map date: 1966-1969

Scale: 1:10,560

Printed at: 1:10,560



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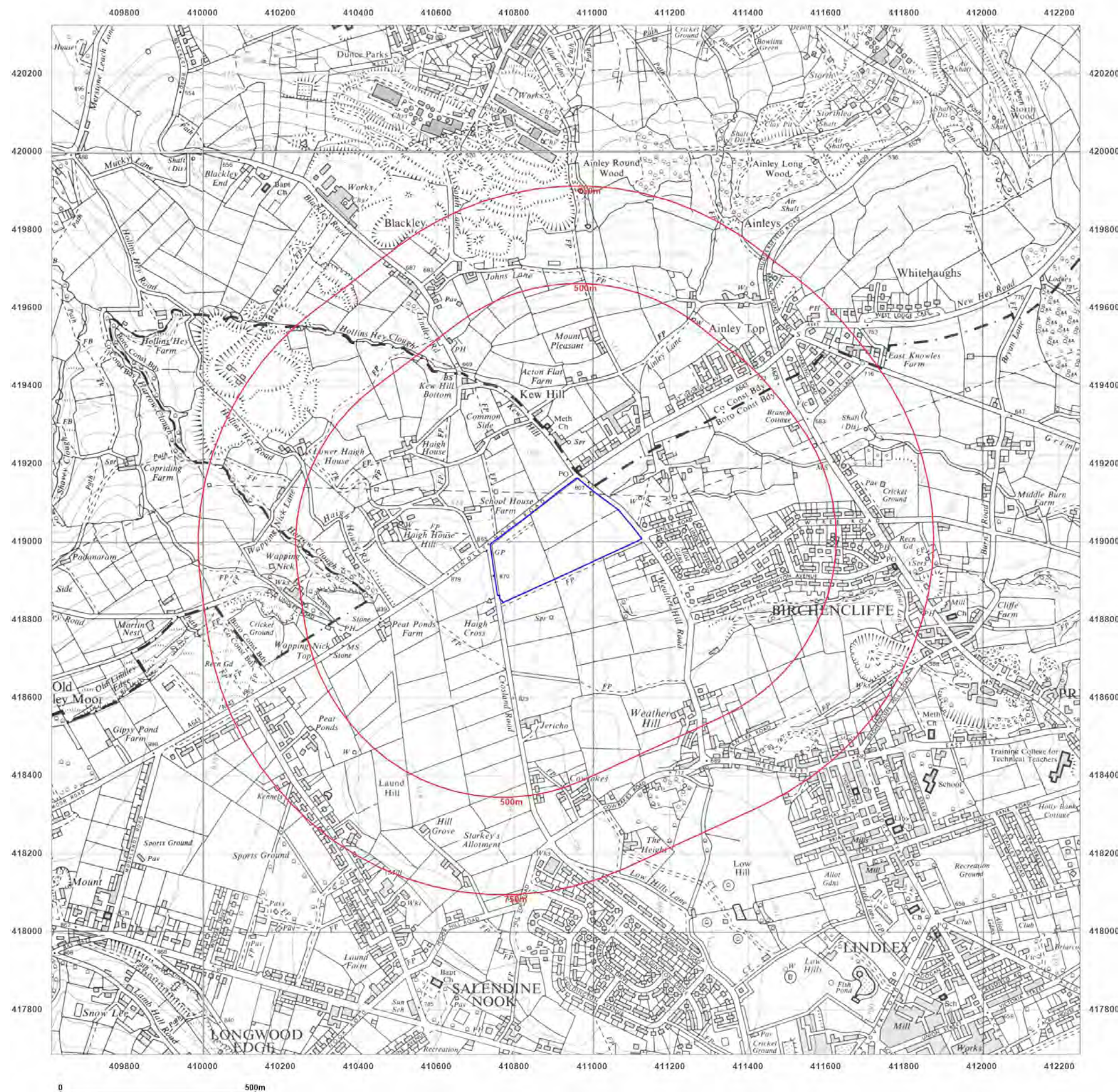


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Client Ref: MWA_7768
Report Ref: GS-8157479
Grid Ref: 410932, 419004

Map Name: National Grid

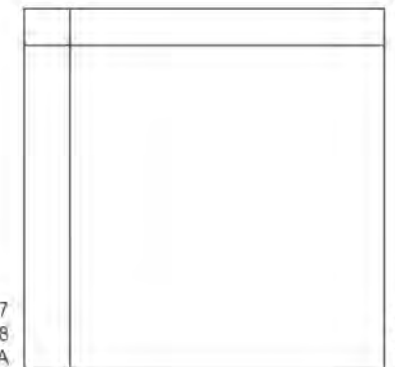
Map date: 1975-1978

Scale: 1:10,000

Printed at: 1:10,000



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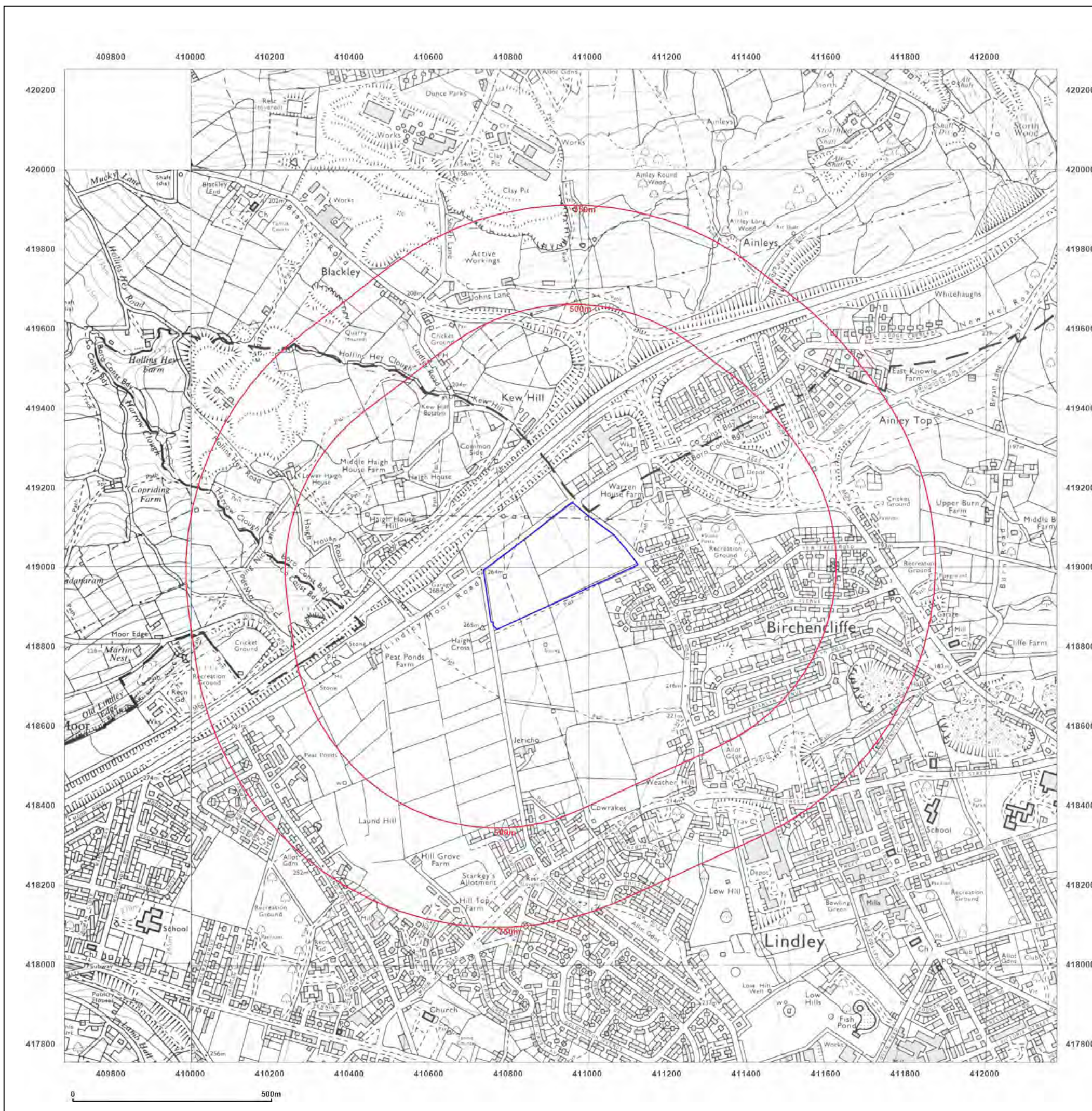


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Grid Ref: 410932, 419004

Map Name: National Grid

Map date: 1981-1985

Scale: 1:10,000

Printed at: 1:10,000



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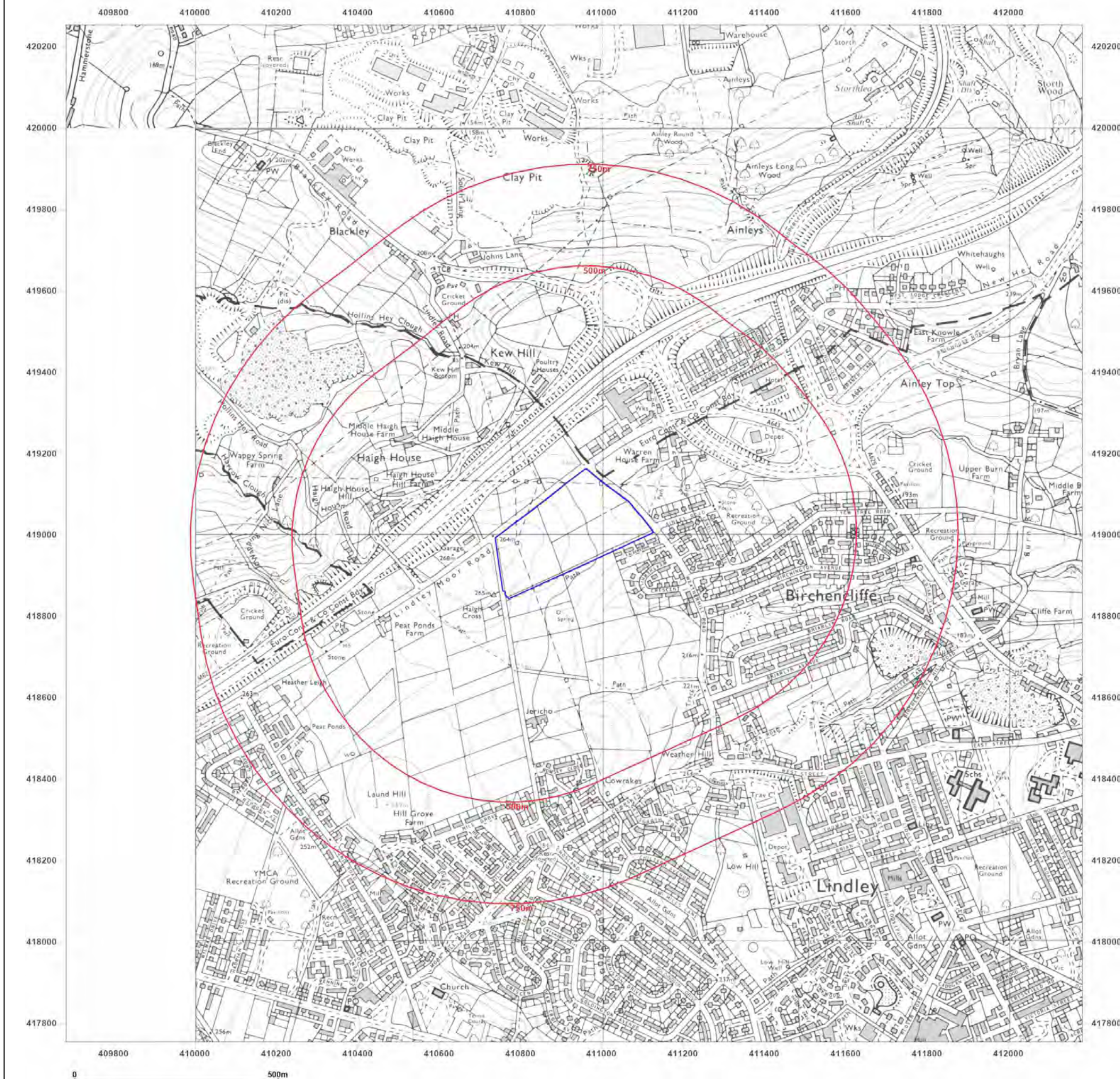


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Client Ref: MWA_7768
Report Ref: GS-8157479
Grid Ref: 410932, 419004

Map Name: National Grid

Map date: 2001

Scale: 1:10,000

Printed at: 1:10,000

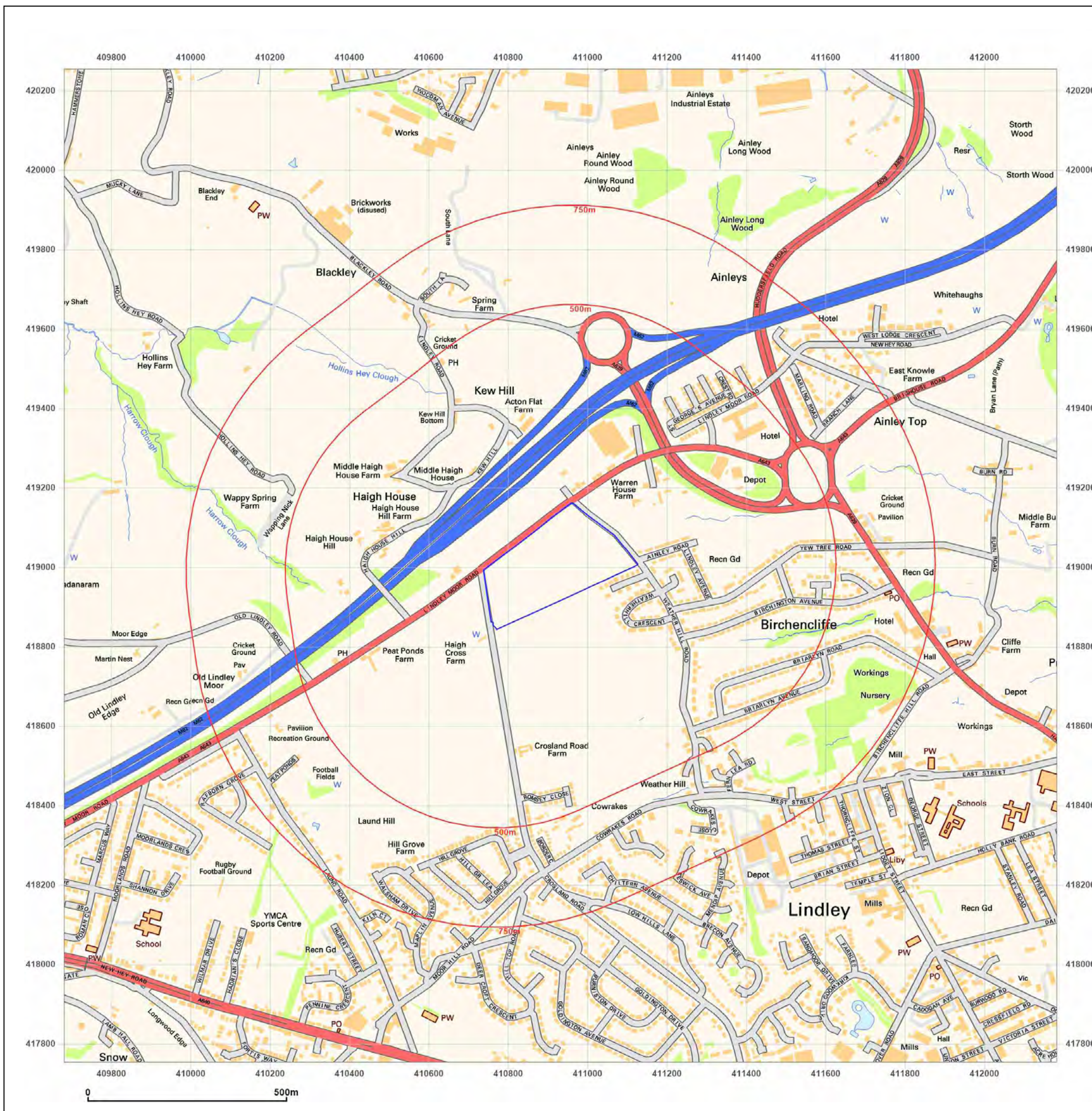


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Client Ref: MWA_7768
Report Ref: GS-8157479
Grid Ref: 410932, 419004

Map Name: National Grid

Map date: 2010

Scale: 1:10,000

Printed at: 1:10,000



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Client Ref: MWA_7768
Report Ref: GS-8157479
Grid Ref: 410932, 419004

Map Name: National Grid

Map date: 2021

Scale: 1:10,000

Printed at: 1:10,000

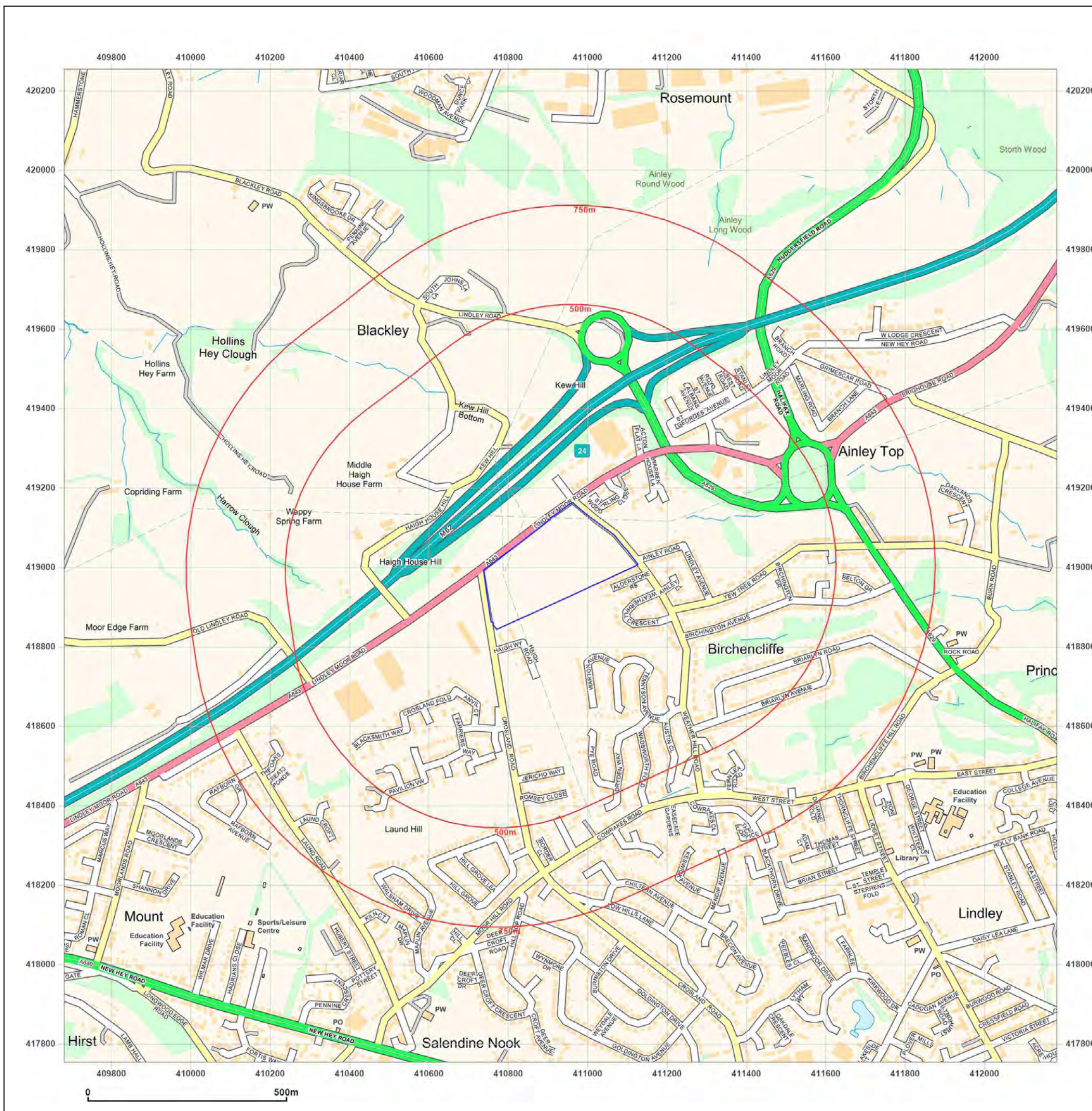


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Client Ref: MWA_7768
Report Ref: GS-8157479_LS_1_1
Grid Ref: 410931, 419003

Map Name: County Series

Map date: 1893

Scale: 1:2,500

Printed at: 1:2,500



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Revised 1893
Edition N/A
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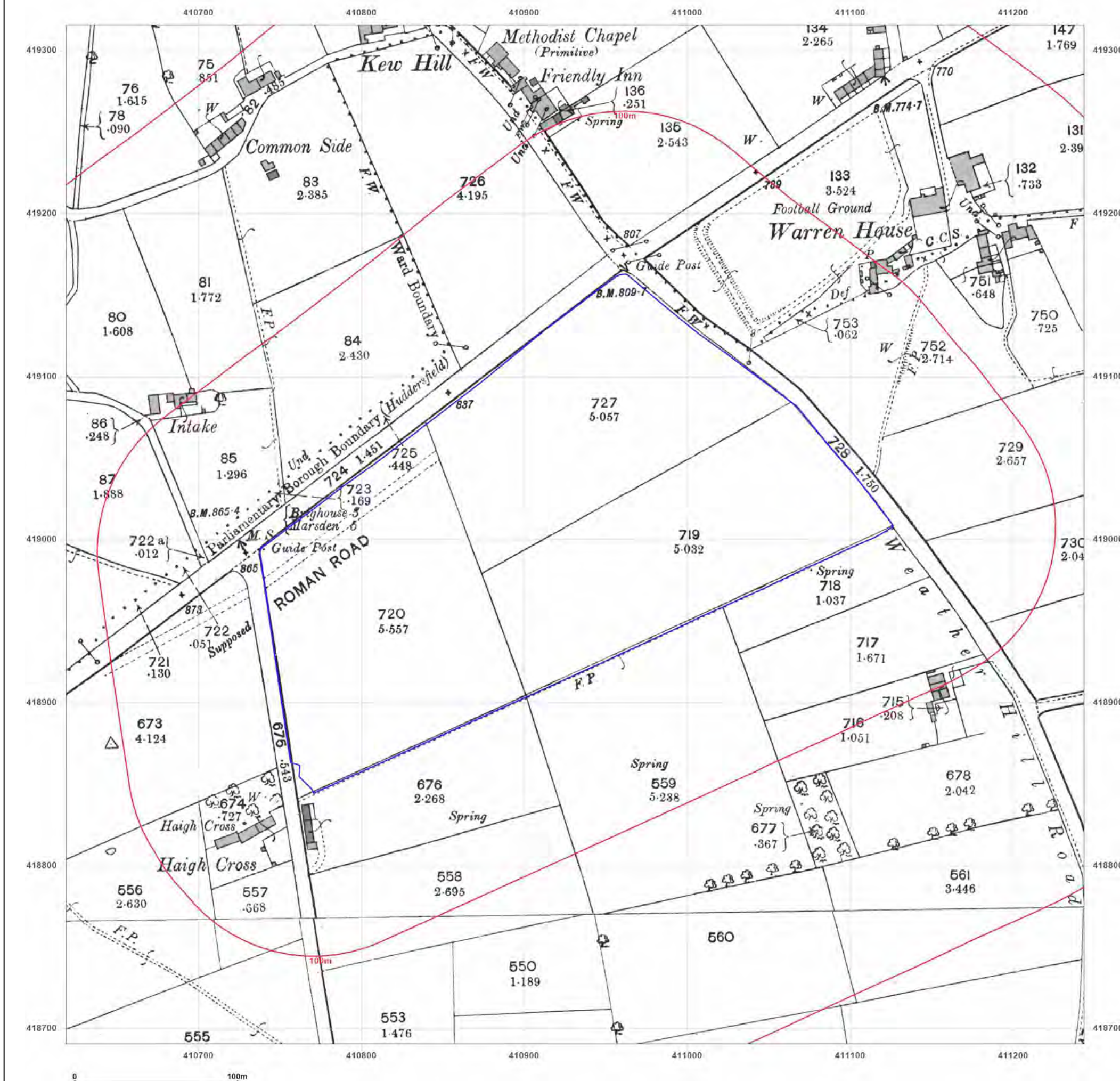


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Client Ref: MWA_7768
Report Ref: GS-8157479_LS_1_1
Grid Ref: 410931, 419003

Map Name: County Series

Map date: 1907

Scale: 1:2,500

Printed at: 1:2,500



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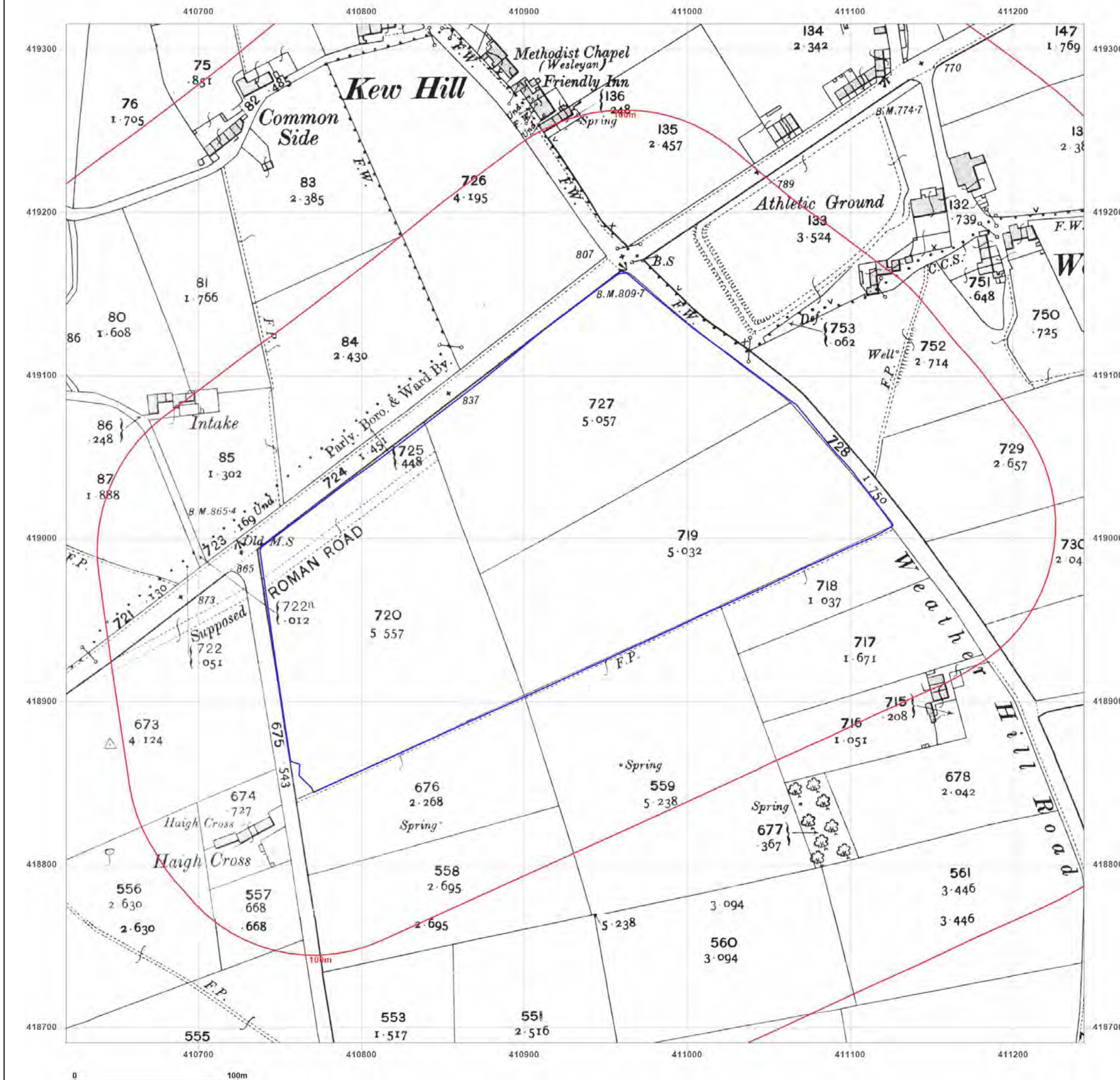


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Client Ref: MWA_7768
Report Ref: GS-8157479_LS_1_1
Grid Ref: 410931, 419003

Map Name: County Series

Map date: 1918

Scale: 1:2,500

Printed at: 1:2,500



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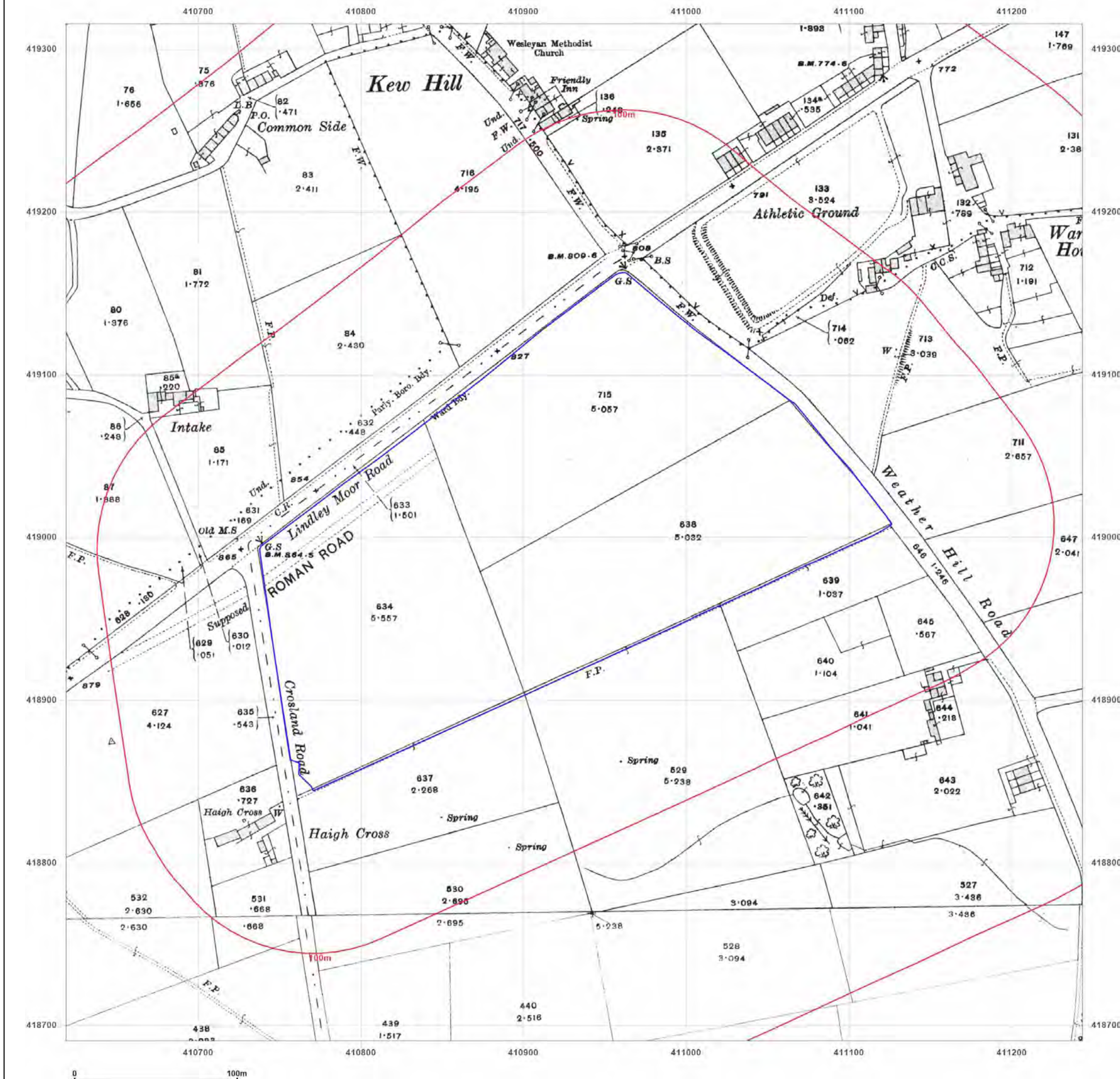


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Client Ref: MWA_7768
Report Ref: GS-8157479_LS_1_1
Grid Ref: 410931, 419003

Map Name: National Grid

Map date: 1963

Scale: 1:2,500

Printed at: 1:2,500



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