AG3080-19-AJ70

APPLiED GEOLOGY

DESK STUDY REPORT
FOR
HOYLAND COMMON, BARNSLEY, M1 JUNCTION 36

REPORT STATUS SHEET

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- Site Location Plan (Drawing No. AG3080-19-01)
- Site Walkover Plan (Drawing No. AG3080-19-04)
- Conceptual Site Model (Drawing No. AG3080-19-05)
- Proposed Site Plan (pHp Architects Drawing 4400-029-P4 19-12-19)

APPENDIX B **DESK STUDY DATA**

- OS Maps
- GeoInsight Report
- EnviroInsight Report
- BGS Archive Borehole Records
- Coal Authority Consultants Report
- MAGIC Maps

1.0 INTRODUCTION

An area of land between the M1 motorway and Sheffield Road to the west of Hoyland Common near Barnsley (the site) is to be redeveloped by Newlands Developments (the Client). The proposals for the site comprised the reprofiling of the site to enable the construction of a single large distribution warehouse and other smaller industrial units, with a new link road and associated infrastructure, parking, and landscaping.

Applied Geology was appointed by Newlands Developments to undertake a Desk Study/Phase 1 Geo-environmental Risk Assessment to:

- Permit formulation of an opinion, as to the potential for hazardous substances or conditions to exist on, at or near the site at levels or in a situation likely to warrant mitigation or consideration appropriate to the intended end use proposed by the Client and as stated above.

- Establish anticipated geological conditions to assist with the design of a ground investigation.

- Support a Planning Application.

Alongside the Phase 1 Geo-environmental Risk Assessment Report, Applied Geology was instructed to undertake a Coal Mining Risk Assessment Report for the proposed development, which is being produced as a separate report.

More specifically, the services provided are summarised below and detailed in the following Sections.

A site inspection and walkover survey to identify indicators (as defined in later sections) of the existence of hazardous substances or conditions on and in the vicinity of the site.

- A review of the following sources to provide data on likely ground conditions, geohazards and features which may affect development and to obtain information about the potential for hazardous substances to exist at and in the vicinity of the site:
    - GroundSure Report – obtained on the 24th October 2019
    - Barnsley Council Planning Portal
    - Liaison with the Regeneration & Culture Department and Building Control at Barnsley Council regarding any environmental or geotechnical information relating to the site
    - BGS - Published Information & Borehole Database
    - Historical Maps
    - Government Web Site – historic landfill database
    - Coal Authority Web Site and liaison with the Coal Authority
    - Coal Mining Report and Abandonment Plans
    - MAGIC Web Site

- Assessment and reporting of the results of the works.

This report should be read in conjunction with the General Notes at the end of the report text.

2.0 SITE LOCATION AND DESCRIPTION

2.1 General

The site is located immediately southeast of Junction 36 of the M1 motorway just west of the village of Hoyland Common, approx. 6km south of Barnsley in South Yorkshire. The Ordnance Survey grid reference for the centre of the site is approximately 435500, 399700 as shown on the Site Location Plan in Appendix A.

The site is irregular in plan shape with maximum extents of 1.3km (NW-SE) and 750m (SW-NE) covering an area of approximately 46 hectares (114 acres). Site levels vary between approximately 150.5mOD towards the centre of the site and 117mOD in the southeast corner of the site. From the centre of the site, ground levels slope down towards the southeast, however, the northern half of the site is gently sloping/undulating, varying between approximately 140mOD and 150mOD. The existing topographic survey drawing has been used as the base for the Site Walkover Plan, a copy of which is included in Appendix A.

2.2 Walkover Survey

A site inspection/walkover was undertaken by Applied Geology on 30^{h} October 2019. Access to the site was gained via Tankersley Lane, Sheffield Road and a private road to the southwest corner of the site. At the time of inspection, the site comprised open fields including arable, pasture and very recently ploughed fields. Apart from a few stables for horses, no buildings were present on site. Tankersley Lane crossed the site running ENE-WSW in the northern part of the site. Towards the south of the site, high voltage ENE-WSW aligned electricity cables supported on large pylons crossed the site. A further smaller overhead electricity cable crossed the extreme northwest corner of the site.

Photographs taken at selected points on the site are included on the Site Walkover Plan in Appendix A. The fields to the north of Tankersley Lane had been recently deeply ploughed and were very wet. Locally, the presence of shale was noted in the turned soil. The fields to the immediate south of Tankersley Lane were grassed with three interconnected fields closest to the M1 containing horses. Fields bordering Sheffield Road to the east of the site were also grassed and contained sheep. The majority of the rest of the site comprised recently planted arable crops (winter wheat) which again were wet in places. There was a small area of one field in the southwest adjacent to the off-site woodland (Bell Ground) left overgrown as cover for game birds. Similarly, a further small area of one field in the centre-east of the site planted with corn had been left uncultivated also to act as cover for game birds.

A small field towards the centre-west of the site adjacent to the M1 cutting was planted with sporadic small trees, otherwise the site was largely devoid of trees. Field boundaries comprised a combination of hedges, timber fences, post and wire fences and one dry stone wall.

The site was bounded to the west by the M1 motorway (largely in cutting), to the south by woods and arable fields, to the north by the M1 Junction 36 roundabout and adjoining roads and to the east by Sheffield Road itself or by playing fields,

allotments, grassed fields/pasture, small industrial properties and a small number (<5) residential properties located off Sheffield Road, Green Lane or Tankersley Lane. A petrol filling station was located on Sheffield Road approximately 50m east of the site. There was a small haulage firm located adjacent to the filling station.

It should be noted that Applied Geology Limited does not provide arboricultural surveys or specialist surveys for the detection of invasive plant species (such as Japanese Knotweed) or protected species of wildlife.

2.3 Proposed Development

The site can be divided into three areas based on the proposed development. The main central area comprising 22.1 hectares (54.6 acres) is to comprise a large distribution warehouse measuring 375m by 75m and orientated NNW-SSE. There are associated lorry parking areas, a lorry wash, a lorry refuelling area, a staff car park surrounding the proposed building. The finished floor level is currently proposed at 144.5mOD (subject to change) and, therefore, significant earthworks will be required to create a level site area at this elevation.

The south-eastern 12.7 hectare (31.4 acre) part of the site is to be prepared for future light industrial development with a level development platform being created at 133.0mOD. This will involve significant areas of fill, increasing in thickness to the south and southeast, such that high engineered slopes will need to be created at these site boundaries.

The 5.6 hectare (13.8 acre) part of the site to the north of Tankersley Lane is also to be prepared to create a level development platform for future light industrial use. It is understood that three small units are proposed in this area, however, development plans have not been finalised. The plateau level in this part of the site is currently proposed at 145.1mOD and will also involve some element of cut and fill.

A new (adoptable) road is to be created linking Sheffield Road at the extreme southeast corner of the site to the existing roundabout immediately north of the site running along the eastern edges of the site. This will link the three parts of the proposed development and keep site traffic, particularly HGVs, out of Hoyland Common centre.

As stated above, significant earthworks will be required to create the proposed plateau levels and it is currently understood that there will be up to 6.5m of cut and up to 14m of fill required. However, proposed site levels and therefore the extents of the cut and fill works are subject to change as the detailed design is undertaken. It is intended that the finished levels will be designed to achieve a cut-fill balance and, currently, no retaining structures are proposed.

3.0 DESK STUDY INFORMATION

3.1 Site History

Historical Ordnance Survey maps were obtained in order to determine any significant past activity or land usage. Copies of these maps are presented in Appendix B of this report and are described below.

Map Date	On the Site	In the Vicinity of the Site
1855	The site comprises numerous fields with trees along several field boundaries and within some fields. Tankersley Lane crosses the northern part of the site and Old Park Wall crosses the centre, both roughly orientated southwest-northeast. Two wells are in the east of the site. A very small pond is near the eastern boundary south of Tankersley Lane.	The surrounding area is predominantly agricultural, except for numerous ironstone pits and bell pits to the south, southeast and southwest of the site, the closest being adjacent to the southeast. The bell pits southeast of the site form Swallow Wood Mine. Land beyond to the south is labelled 'Bell Ground'. A sandstone quarry is 600m south of the site. The Tankersley Park Railway is 120m south of the site and the Thorncliffe and Elsecar Railway is 580m southeast of the site, providing transport to and from the ironstone pits, bell pits and sandstone quarry. The South Yorkshire Railway is 300m northwest of the site.
1891-1894	A footpath runs adjacent to the Old Park Wall and a third well is shown adjacent to the wall by the eastern site boundary. Two further small ponds are on site, one near the centre and one by the southeastern site boundary. A stream issues in the southeast of the site, flowing to the southeast. No other significant changes.	The ironstone pits and bell pits and the sandstone quarry are no longer labelled as operational but the excavations remain. Mounds are shown in the locations of the former ironstone pits and bell pits southeast and west of the site. The railways south and southeast of the site, associated with the former pits, have been dismantled. Woodland is present adjacent to the south of the site, with a pond 200m southwest and springs 100m southeast and 350m south. A cricket ground is adjacent to the northeast of the site and a pond is 25m northeast. There has been residential development of Hoyland Common east of the site. Allotment gardens are 40m east of the site. Rockingham Gas Works is 315m northwest of the site, beyond the South Yorkshire Railway, with Birdwell Quarry adjacent, 380m northwest. Rockingham Colliery is 430m north of the site, beyond the railway, with a reservoir 380m northeast. Lidgett Colliery is located 650m southeast of the site, with shafts and air shafts marked in the vicinity. A pumping station is shown c.500m south of the site. Skier's Spring Brick Works is 800m southeast. The colliery and brick works are both serviced by a new railway line.
1903-1906	Only one well is shown. No other significant changes.	Another pond is 145m southwest of the site. A police station is 190m north of the site. Old shafts are marked 440m and 570m south of the site and two air shafts are labelled 480m and 620m southeast of the site, associated with Lidgett Colliery. The pumping station c.500m south has increased in size.
1929-1931	Only one well is shown towards the centre of the site. A few small buildings have been constructed immediately east of the site alongside the site boundary. No other significant changes.	Further shafts, old shafts and air shafts are present to the south and southeast of the site, the closest being an air shaft 175m south of the site. Allotment gardens are adjacent to the east of the site and there has been further residential development of Hoyland Common beyond. The brick works is now labelled as a pottery. Staindrop coal pit is c.600m southeast of the site. A golf course is 600m south/southwest of the site.
1938	No significant changes.	No significant changes.
1948	No significant changes.	There has been further residential development of Hoyland Common to the east and northeast. Large conical and linear mounds are located 550m northeast of the site.
1951-1956	Some of the buildings in the east/southeast have been demolished, with one marked as a 'ruin'. Two small new buildings have been constructed in the east. Electricity pylons cross the	The aerial ropeway crossing the site extends off site to the north and south. A garage is located 50m east of the site. The gas works is no longer marked and the associated structures have been demolished and replaced with new buildings forming the NCB Central Workshops. Birdwell Quarry is disused and has been partially

Map Date	On the Site	In the Vicinity of the Site
	southeast of the site. An aerial ropeway is shown crossing the northern and western part of the site, orientated approx. north-south. The small pond by the south-eastern site boundary is no longer shown.	backfilled. 'Ruins' are marked 280m and 350m east of the site, within the residential area of Hoyland Common.
1965-1966	All of the buildings have now been demolished. No wells or ponds are shown.	The allotment gardens east of the site are now playing fields. The mounds northeast of the site associated with Rockingham Colliery are now marked as a refuse tip and have expanded. A surface water feature is adjacent to the south of the tip. Another refuse tip is present in the location of the former coal pit 600m southeast of the site.
1968-1980	One building has been constructed in the southeast of the site, adjacent to where the stream issues. The aerial ropeway is no longer marked on site.	The aerial ropeway is no longer marked off site. A running track has been constructed adjacent to the northeast of the site. There has been significant residential development of Hoyland Common east of the site. A nursery and a transport depot are within 50m of the eastern site boundary. An electricity substation is 80m east of the site by 1970. Northeast of the site is a garage (135m), and a body motor works (140m), a builder's yard (165m) and slurry ponds (280m). An engineering works, marked on the 1968-1972 map 240m east of the site has been demolished and redeveloped with residential dwellings by 1977. The M1 has been constructed adjacent to the west of the site, with Junction 36 adjacent to the northwest of the site. A highways depot is 110m northwest, an engineering works is 300m northwest and a garage is 500m northwest. The refuse tip northeast of the site has significantly expanded, now 390m northeast of the site at its closest. The refuse tip southeast of the site is marked as disused. Another refuse tip is located 300m south of the site and another disused refuse tip is marked 245m southwest of the site, beyond the M1.
1987-1992	The building in the southeast is no longer shown.	The refuse tips northeast and southeast of the site have expanded and the former reservoir is now also marked as Tip (disused). The refuse tip south of the site is no longer marked.
1993	No buildings are now shown on site.	No significant changes (little coverage).
2001-2019	No significant changes.	The pond northeast of the site appears to have been infilled and has been developed with a house.

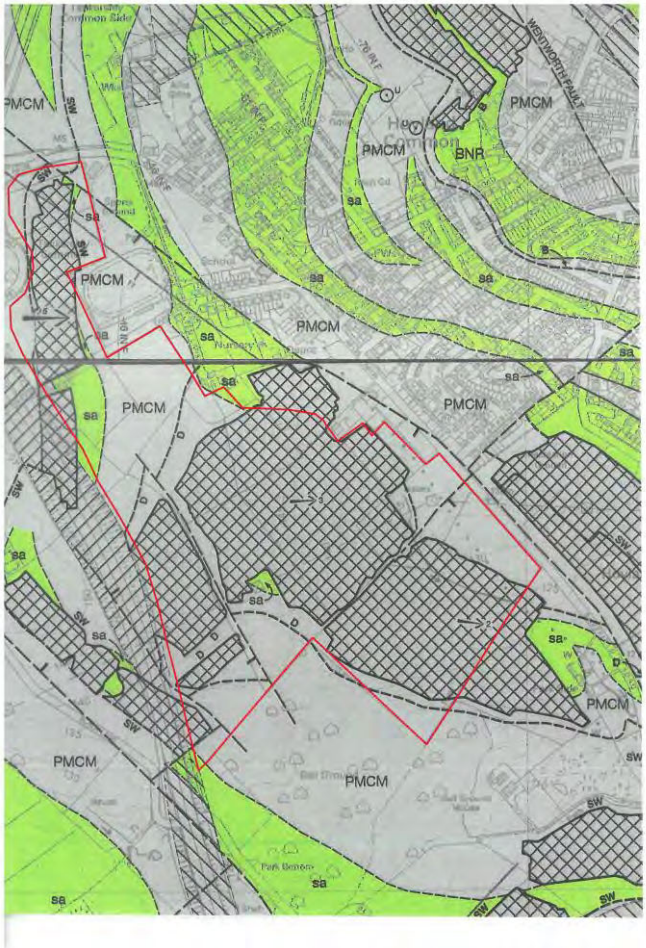
Summary: the site has comprised fields since at least 1855, with Tankersley Lane crossing the northern part of the site, three former wells (none now shown), three ponds (none now present), a stream in the southeast and a few small buildings that have since been demolished. An aerial ropeway formerly crossed the north and west of the site. Electricity pylons are currently present in the southeast of the site. The immediate surrounding area has been subject to ironstone and coal extraction, with ironstone bell pits and pits adjacent to the southeast of the site and close to the southwest of the site and collieries to the north and southeast. In addition, a sandstone quarry was south of the site and an unidentified quarry to the northwest. A gas works, an engineering works, railway lines linking the pits and quarries, depots, garages, refuse tips, a builder's yard, a nursery, allotment gardens, electricity substations and former ponds were also present in the surrounding area.

During the 1970s, the M1 was constructed in cutting adjacent to the southwest of the site, with Junction 36 adjacent to the northwest.

Although not obvious from the historical Ordnance Survey maps, it is known that large parts of the site were previously opencast mined (coal) with restoration back to agricultural use completed shortly after mining (late 1940s/early 1950s). Further details are given in Section 3.3 below.

3.2 Anticipated Geology

Reference to the published 1:10,000 scale British Geological Survey (BGS) maps, Sheets SE30SE (Wombwell) and SK39NE (Chapeltown) [Bedrock Geology] dated 2005 indicate the site to be underlain by Solid Geology of the Pennine Middle Coal Measures Formation of Carboniferous age. The Pennine Middle Coal Measures Formation typically comprises interbedded grey mudstone, siltstone and sandstone with numerous workable coal, ironstone and fireclay seams, which have been historically worked in the area. The stratum is shown to dip by between 2 and 5 degrees to the east. No natural Superficial Deposits are shown to be present on or in the vicinity of the site. Extracts from the above maps are shown below:



In the north of the site, the Swallow Wood Coal seam outcrops, dipping 5 degrees to the east. Historical opencast mining has occurred (Tankersley Common opencast pit), followed by subsequent backfilling. The Swallow Wood Coal seam is identified on the geological map to be between 0.89m and 3.68m thick. The Geological Memoir 'Geology of the Country around Barnsley' dated 1947 states that the

Swallow Wood Coal seam is the same as the Netherton Thick Coal seam and the Top Haigh Moor Coal seam encountered elsewhere around Barnsley. A sandstone lens beneath the Swallow Wood Coal seam is shown to the east of the area of infilled ground just south of Tankersley Lane. A geological fault is marked in the northeastern corner of the site, downthrown to the southwest by 11m.

In the centre and south of the site, the Harley or Dunsil Coal seam, approximately 20-25m above the Swallow Wood Coal seam, outcrops at various locations, displaced by several faults. The majority of the centre and southeast of the site has been subject to opencast mining and subsequent backfilling. A small wedge of sandstone is mapped near the centre of the site.

The general sequence of coal seams below the Swallow Wood Coal, based on the BGS 1:10,000 scale maps, BGS Memoir and Coal Authority report is as follows:

Summary of Workable Seams Beneath Site

Seam*1	Approx. Depth (m bgl)*2
Swallow Wood	23
Lidgett	64
Top Fenton	113
Tankersley Ironstone	127
Flockton Thick	128
Middleton Main	156
Low Fenton	185
Parkgate	199
Silkstone	223

Notes: 1. Names of seams vary depending on source of information
2. Depths will vary due to site topography and dip of strata

The GroundSure Report confirms that much of the site is infilled ground and identifies the presence of several coal seams and faults, at the locations shown on the geological maps. A copy of the GroundSure report is included in Appendix B.

The BGS online archive was checked for records of any relevant archived boreholes within the vicinity of the site. Forty-four borehole records were identified on the site and selected copies are included in Appendix B. These boreholes were undertaken as part of a wider site investigation in 1989 (i.e. post opencast) for the subject site and the area to the southeast. The work was undertaken on behalf of Barnsley Metropolitan Borough Council, who were contacted but do not appear to have retained a copy of the site investigation report. The borehole records that appear to have been archived by the BGS seem to relate to rotary openhole boreholes drilled outside the area of opencast mining and none of the records of the boreholes, trial pits or trial trenches undertaken within the area of opencast, or (presumably) undertaken to locate the opencast high wall, were available to inspect.

A detailed geological assessment and Coal Mining Risk Assessment is being prepared under separate cover (Applied Geology Report Ref. AG3080-19-AJ77), but for the purpose of this report, the archive boreholes have been summarised as follows:

North of Tankersley Lane: (outside area of opencast) ground conditions generally comprised Topsoil from ground level to 0.3m below ground level (bgl), underlain by clay to depths of between 1.4m and 2.3m bgl. Beneath was bedrock of the Pennine Middle Coal Measures Formation comprising sandstone to depths of between 2.2m

bgl and 2.3m bgl and then mudstone to depths of between 6.1m bgl and 10.0m bgl. A coal seam, identified as the Swallow Wood Coal, was logged beneath the mudstone, 0.8m to 0.9m thick. Beneath the coal was mudstone to the base of the boreholes, proven to a maximum depth of 12m bgl. The eight boreholes were dry.

South of Tankersley Lane: (outside area of opencast) the Harley or Dunsil Coal seam was identified in numerous boreholes, separated into two seams by a thin mudstone band. This seam was encountered at various depths, as would be anticipated, given the faulting across the site, with the upper Harley Coal seam being encountered at its shallowest at 1.8m (SK39NE116 & 119) in the south and at its deepest at 17.7m bgl (SK39NE112) in the east. There are several unidentified coal seams logged on the BGS records, above the Harley Coal seam, together with the Swallow Wood Coal seam being identified in nine boreholes in the west of the site, with the top at depths of between 9.0m and 16.4m bgl. One borehole (SK39NE110 in the east), which recorded the upper Harley Coal seam at 2.0m bgl, is at significant variance with the depth to the Harley Coal seam in adjacent boreholes and may be another coal seam. Water was recorded as struck in six out of the thirty-five boreholes, at depths of between 4.0m and 15.6m bgl.

In SK39NE109, in the east of the site, no returns (solid ground) was noted between 15.0m and 18.5m bgl. In SK39NE131, in the west of the site just south of Tankersley Lane, disturbed ground (opencast backfill) was logged between 2.0m and 6.0m bgl. In nearby SK39NE133, soft drilling and very poor returns (opencast backfill) was logged between 2.0m and 9.0m bgl, with no returns (solid ground) to 10.0m bgl.

Appended to the above BGS logs is an exploratory hole location plan showing all the exploratory holes undertaken across the site and adjoining area.

3.3 Mining History/Geological Cavities

The site is within a Coal Mining Reporting Area, with much of the site within a Development High Risk Area. A Consultant's Coal Mining Report has been obtained, a copy of which is presented in Appendix B.

The Coal Mining Report dated 24th October 2019 identifies eleven ironstone mine shafts and four coal mine shafts on or in the immediate vicinity of the site. Shafts 435399-013 and -020 appear to be in the far southeast of the site and are ironstone shafts. Two of the coal shafts are marked as having been 'filled and mounded to an unknown specification'. The shafts tie in with the bell pits and shafts marked on the historical maps adjacent to the southeast of the site. Outcrops of the Dunsil Coal and the Swallow Wood Coal seams are identified in the northwest, centre and south of the site. Land north of Tankersley Lane and the central, southern and southeastern parts of the site are shown as having been subject to opencast mining. The property is in an area where a notice to withdraw support was given in 1946. There is one coal mining subsidence claim close to the east of the site, along Sheffield Road. There are no records of mine gas issues within 500m of the site. There are no licences for current coal mining or future underground coal mining within 200m of the site.

There are numerous records of past underground mining on and near the site, mostly relating to coal seams, but two relating to ironstone seams, between 23m

and 346m bgl. These were last worked between 1857 and 1972. It should be noted that there is also the potential for unrecorded past workings to be present on site.

Several abandonment plans for the site have been obtained and these indicate shallow (opencast workings) up to c.12m deep in the east and shallowing to the west towards the mapped positions of the seam outcrops. The opencast mining occurred in the late 1940s with restoration completed very soon after by the early 1950s. The abandonment plans indicate that the opencast pits were infilled with overburden comprising clay, mudstone, sandstone and shale. Selected abandonment plans were also obtained of underground mining of the Swallow Wood Seam to the immediate south of the site and the Lidgett Seam beneath the majority of the site. The opencast in the south-eastern part of the site coincides with some of the former bell pits and is likely to have excavated these as part of the opencast workings.

Further details of the abandonment plans are included in the separate Coal Mining Risk Assessment report.

The GroundSure Report identifies one hundred and forty-four historic ground workings within 1km of the site, predominantly for ironstone and coal but also for sandstone and clay/shale. The closest was Swallow Wood Mine, adjacent to the southeast of the site.

The Groundsure Report also notes the site is not located in an area of recorded natural cavity formation, nor is it within area of known brine or gypsum extraction.

3.4 Natural Ground Stability Hazards

The GroundSure Report has classified the risk of various natural ground stability hazards, depending on the anticipated ground conditions on site. These tend to have a range of risk, given that part of the site is underlain by backfilled opencast pits and some by natural ground.

The risk of ground dissolution of soluble rocks is negligible, of shrink-swell of clays and running sand is negligible to very low, of collapsible deposits is very low, of landslides is low to very low and of compressible rocks is negligible to moderate.

3.5 Radon

The GroundSure Report, which sources information on radon affected areas from the BGS/Public Health England, identifies that the site is within an area where between 1% and 3% of properties are above the Action Level. Therefore, no precautions against ingress of radon into buildings are considered necessary for the proposed development.

3.6 Hydrology

The nearest surface watercourse is a stream, which issues in the southeast of the site and flows to the southeast.

There are no recorded surface water abstractions within 2km of the site.

According to the GroundSure Report, there are three licensed discharge consents within 500m of the site, the nearest being 140m to the northeast for sewage discharges into the River Wiske.

The site is not within Fluvial Flood Zones 2 or 3. However, this report is not intended to be a full hydrological study and if a flood risk assessment is needed, additional analysis by others is recommended to confirm this aspect of the development.

3.7 Hydrogeology

The Pennine Middle Coal Measures Formation is classified by the Environment Agency as a Secondary A Aquifer.

There are no groundwater abstractions within 500m of the site, the nearest being 580m southwest of the site for spray irrigation at Tankersley Park Golf Club.

The site is not located within a groundwater Source Protection Zone.

3.8 Environmental Searches

Information pertaining to environmental issues was obtained from the GroundSure Report. This database contains sets of data corresponding to the databases held by a number of sources including the Environment Agency, British Geological Survey, British Gypsum, The Coal Authority, Public Health England, Johnson Poole & Bloomer and Peter Brett Associates. It should be noted that the site boundary as shown on the Groundsure maps and reports is slightly different to that shown on the relevant drawings included in Appendix A. It is understood, that the latter shows that correct boundary that will be the subject of the planning application.

The Government website and GroundSure Report indicate that there are no historical landfill sites within 250m of the site, although it is known that the former opencast pits on site and other pits in the vicinity off site have been infilled. Gas monitoring data from a backfilled historic opencast pit adjacent to the north of the site is detailed in Section 3.13.

There are four recorded pollution incidents within 250m of the site, all minor incidents (Category 3) to land and/or water. One was on site, in the southeast, for unidentified oil in 2003. The others, off site, were for inert construction/demolition materials, household waste and asbestos in 2003.

The GroundSure Report states that there are two current fuel filling stations within 250m of the site, one being the Shell garage at the location of the garage/transport depot 50m east of the site and the other a Jet garage 135m northeast of the site. Both hold Part B environmental permits for unloading of petrol into storage at service stations. A historical Part B environmental permit for petrol vapour recovery at a Save Serv Station on Sheffield Road is mapped in the northwest of the site, north of Tankersley Lane. However, since this is not shown on the historical maps and the postcode is the same as for the Shell garage on Sheffield Road, it is likely to have formerly been in the location of the Shell garage and incorrectly referenced. The GroundSure Report notes the presence of a historic tank at the transport depot 50m east of the site.

Another garage, Lidget Garage, is identified by GroundSure to have a waste management licence for physico-chemical treatment. Whilst this is also shown to be located in the northwestern corner of the site, it is in fact located 700m southeast of the site on Sheffield Road.

The GroundSure Report states that neither the site nor any land within 500m is currently designated as Contaminated Land under Part IIA of the Environmental Protection Act.

3.9 Current Industrial Land Uses

Twenty-seven current industrial land uses have been identified within the GroundSure Report within 250m of the site. Those considered to be potential sources of contamination are summarised below.

Summary of Relevant Current Industrial Land Uses

Trade	Distance from site (m)	Principal Potential contaminants
Vehicle distribution and haulage	50m E	Petroleum hydrocarbons, lubricating oils
Vehicle repair, testing and servicing	75m E, 190m E & 220m E	Petroleum hydrocarbons, lubricating oils
Electricity substation	80m E, 185m E & 205m E	PCBs if pre-1970s
Fuel filling station	50m E & 135m NE	Petroleum hydrocarbons
Works	190m NE	Metals, hydrocarbons, solvents
Tank	190m NE	Potentially hydrocarbons
Vehicle hire and rental	195m NE & 230m E	Petroleum hydrocarbons

3.10 Railways and Tunnels

There are no recorded former or current railways or tunnels on or within 250m of the site. The Groundsure Report notes that the 2016 revised High Speed 2 proposed route passes approximately 80m from the eastern extremity of the site. However, the current (2019) gov.uk website shows the HS2b route several miles to the east of the site. It should be noted that the route has not been finalised at the time of writing.

3.11 Ecology

Information from environmental and ecological datasets was obtained from a review of the MAGIC (Multi-Agency Geographic Information for the Countryside) website undertaken on the 17th December 2019.

There are several priority habitats within 250m of the site, including deciduous woodlands and an orchard, the closest being the woodland adjacent to the south of the site. The site is within a designated farmland bird breeding area and a priority area for addressing lapwing habitat issues.

The GroundSure Report identifies that the site is located in a Nitrate Vulnerable Zone and is within the Liverpool, Manchester and West Yorkshire Greenbelt.

If a full assessment of Environmental or Ecological aspects is required, it is recommended that other specialists are consulted.

3.12 Unexploded Ordnance

The Zetica on-line bomb risk map identifies the site to be within a low risk area of unexploded bombs from WWII, although ruins are marked near the site on the 1955-1956 historical map.

3.13 Information from the Planning Portal

A 'Phase 1 Ground Conditions Report' (ref. 70019822-001, Draft for Comment) dated March 2016 by WSP Parsons Brinckerhoff was obtained from the Barnsley Council Planning Portal. This report covers land adjacent to the north of the site, beyond Sheffield Road. It included a review of four previous reports by others, some of which were intrusive ground investigation reports and one of which we have obtained from the Planning Portal (a Ground Investigation Report by Subsurface North East Ltd, dated October 2014, ref. NE3312A).

A summary of pertinent information within the Phase 1 report is presented below:

- The Coal Authority Report indicates deep below ground coal mining has taken place beneath the site, with the shallowest workings being the approximately 1m thick Lidgett seam at approximately 60m bgl.
- More recently, opencast surface coal extraction is understood to have occurred, which started in 1989. Backfilling compaction operations commenced in September 1990 and were completed in September 1996. Final restoration of the site occurred between 1994 and 1999.
- During deep coal mining activities, groundwater was pumped from beneath the site to maintain dry workings. All coal extraction within a few kilometres is reported to have ceased by the early 1990s, since which time mine water levels have been gradually rising. By 2002, it was reported that mine water levels had risen to approximately 60m AOD (approximately 70m to 80m bgl) beneath the site (subject to seasonal variations). Groundwater monitoring was undertaken at the site by UK Coal between 1993 and 1996, since backfilling was completed. The results indicate that a shallow perched water table is present within the area of fill.
- A 2001 investigation by Mott MacDonald identified no visual or olfactory evidence of contamination during the excavation of the trial pits and no elevated concentrations of contaminants above relevant residential screening values.
- During a 2003 investigation by Mott MacDonald, three post-fieldwork monitoring visits recorded groundwater to be standing at depths of between 2.2m and 16.5m bgl. Ground gas monitoring recorded methane below detection limits, carbon dioxide up to 12.8%vol and flow rates below detection limits. Concentrations of contaminants from sixty soil samples were found to be below 2016 commercial/industrial screening values (asbestos was not tested for). Concentrations from twenty-eight leachate samples were below 2016 EQS, except for elevated concentrations of zinc across the site and localised elevated concentrations of lead, nickel and copper. Four groundwater samples had concentrations of contaminants below the relevant 2016 EQS, except for zinc and nickel, which were elevated in all four samples.

- The 2014 investigation by Subsurface North East was carried out to identify any evidence of shallow coal workings associated with the Swallow Wood Coal seam in the far south of the site. Shallow mine workings were identified within exploratory hole M6, adjacent to Sheffield Road. These mine workings were recorded between 2.0m and 3.0m bgl as stowed waste in the far southwestern corner, where limited opencast activities are understood to have taken place. This was interpreted as being outside the extents of the opencast i.e. unrecorded shallow mining prior to the opencast operations. WSP Parsons Brinckerhoff identified that other areas outside the opencast extents may also potentially be underlain by shallow workings. Groundwater monitoring during three post-fieldwork visits recorded perched water at depths of between 0.8m and 1.9m bgl. Ground gas monitoring recorded methane up to 1.1%vol, carbon dioxide up to 28.3%vol, oxygen down to 0.5%vol and flow rates up to 1l/hr. Concentrations of contaminants tested in four soil samples were below 2016 commercial/industrial screening values. Concentrations from two leachate samples were below 2016 EQS, except for a marginally elevated concentration of PAH in one sample.
- Based on limited calorific results and the reported nature of the colliery spoil, the risk of spontaneous combustion of the material was considered by WSP Parsons Brinckerhoff as low.
- Limited testing as part of the 2003 and 2014 ground investigations has indicated a concrete design classification of Design Sulphate Class DS-4 and Aggressive Chemical Environment for Concrete (ACEC) class AC-5.

The Ground Investigation Report by Subsurface North East Ltd, dated October 2014 (ref. NE3312A) identified that the Tankersley Common opencast site covered the northern part of the subject site. The opencast is recorded to have worked the Swallow Wood Coal seam (84cm thick) during the 1940s, with the subsequent backfill material not having been compacted. A drawing showing the extent of the opencast site was produced by the South Yorkshire Mining Advisory Service (ref. M3687/5A) and was part of a Mineral Report by SYMAS dated 2013.

At the time of writing this report, Applied Geology were attempting to obtain the ground investigation report for the exploratory holes carried out on the subject site in 1989, some of the logs being available on the BGS website. However, the report was not available on the Planning Portal, nor was a copy held by the Regeneration & Culture Department or Building Control at Barnsley Metropolitan Borough Council. The landowner at the time of the 1989 investigation is still the current landowner and was also contacted to see if a copy of the report was available but Applied Geology was informed that no records were on file.

4.0 CONCEPTUAL MODEL

In developing a Conceptual Model for the site, pollutant linkages are determined by identifying likely sources of contamination from previous and current site uses, possible targets such as site users, neighbouring site users and Controlled Waters and linkages between them. These are discussed below. A diagrammatic representation of the potential pollutant linkages for this site is included in Appendix A as Drawing No. AG3080-19-05.

4.1 Summary of Site History

The site has comprised fields since at least 1855, with Tankersley Lane crossing the northern part of the site and a small stream present in the southeast from that time. Significant parts of the site were opencast mined for coal in the late 1940s and were backfilled with overburden (assumed uncontrolled) and restored back to agricultural use by the early 1950s. An aerial ropeway formerly crossed the north and west of the site associated with the opencast mining activities. It is possible that very shallow unrecorded coal and ironstone workings may also have occurred on site, that were not shown on the historical maps.

The immediate surrounding area has been subject to ironstone and coal extraction, with ironstone bell pits and pits adjacent to the southeast of the site and close to the southwest of the site and collieries to the north and southeast. In addition, a sandstone quarry was south of the site and an unidentified quarry to the northwest. A fuel filling station and haulage yard first appeared in the 1950s and are still present 50m east of the site. Another fuel filling station is currently present 135m northeast of the site. A former gas works, an engineering works, railway lines linking the pits and quarries, depots, garages, refuse tips, a builder's yard, a nursery, allotment gardens, electricity substations and former ponds were also present in the surrounding area. During the early 1970s, the M1 was constructed in cutting adjacent to the west of the site.

4.2 Summary of Anticipated Geology

The site is anticipated to be underlain predominantly by backfill to the historic opencast pits, underlain by the Pennine Middle Coal Measures Formation. The opencast pits appear to have extracted the Swallow Wood Coal seam north of Tankersley Lane and the Harley/Dunsil Coal seam to the south, with coal seams below mined by deep mining. The possibility of unrecorded workings exists. Old coal/ironstone shafts are marked on the southeastern edge of the site, with other old ironstone and coal shafts and historic ironstone bell pits adjacent to the southeast.

4.3 Sources

The following specific sources of contamination were identified in the desk study:

- Backfill to the opencast pits on and off site;
- Spoil, if present, associated with potential unrecorded historic coal/ironstone workings on site;
- Ground gases from backfill material on and off site;
- Mine gases on and off site;
- Hydrocarbons from current and historic off-site uses, particularly the garage/filling station and haulage yard 50m to the east of the site;
- Sulphates in backfill material or underlying natural strata on site.

Given the distance from the site, the former gas works, engineering works, substation, slurry ponds, licensed discharge consent and refuse tips marked on the historic maps are considered too far away to represent plausible sources of contaminants that could impact the site.

Given the age of the pollution incidents and the pollutants involved, these are not considered to represent plausible sources of contaminants that could impact the site.

4.4 Receptors

The following receptors have been identified:

- Proposed end users (commercial development);
- Neighbours (few residential properties, agricultural land);
- Pennine Middle Coal Measures Formation (Secondary A Aquifer);
- Stream on site;
- Buried foundation/substructure concrete (Building Materials);
- Water supply services (Building Materials).

The risk to construction workers is not included here due to the short-term exposure times that they will be subject to and the assumption that good hygiene practices will be adopted on site and the appropriate use of relevant PPE/RPE will be adhered to when exposed to potentially contaminated soils.

4.5 Pathways

Taking into account the proposed commercial/industrial end use, the following pathways are relevant to this development:

- Gas migration to future buildings and off-site receptors;
- Inhalation of dust, gas and vapour;
- Ingestion of soil;
- Dermal contact with contaminated soil;
- Direct contact with soil by services, concrete and infrastructure;
- Leaching and/or migration through permeable horizons;
- Vertical migration through historic ironstone shafts and wells on site;
- Plant uptake.

4.6 Summary

The Conceptual Model described above is summarised below together with the source-pathway-receptor linkages and qualitatively assessed levels of risk:

Initial Conceptual Site Model

Source	Pathway	Receptor	Risk*
Backfill material to historic opencast pits (on and off site) and possible spoil from any historic unrecorded workings (on site).	Dermal contact, ingestion and inhalation of dust	End users	Low
	Migration and leaching	Neighbours	Low
		Aquifer	Low-medium
		Stream	Low
	Downward migration via old shafts/wells	Aquifer	Low-medium
	Direct contact	Water Supply Pipes	Low

Source	Pathway	Receptor	Risk*
	Plant uptake	Landscaping	Low
Ground gas from spoil from any historic unrecorded workings and backfill material to historic opencast pits (on and off site)	Inhalation	End users	Medium
	Upward migration via old shafts/wells	End users	Low-medium
	Migration and inhalation	Neighbours	Low
Mine gas from the Pennine Middle Coal Measures strata (on and off site)	Inhalation	End users	Low-medium
	Upward migration via old shafts/wells	End users	Low-medium
	Migration and inhalation	Neighbours	Low
Potential hydrocarbons from current and former land uses (off site)	Migration and leaching	End users	Low
		Aquifer	Low -medium
		Stream	Low-medium
		Water supply pipes	Low
		Landscaping	Low
Potential metals and other inorganic contaminants from former land uses (off site)	Migration and leaching	End users	Low
		Aquifer	Low
		Stream	Low
		Water supply pipes	Low
		Landscaping	Low
Elevated sulphates in backfill material/natural soils (on site)	Direct contact	Buried concrete	High

*** Definition of Risk Categories**
Negligible - Contaminants that might have unacceptable impact on key receptors, are unlikely to be present, or, no pathway is envisaged.
Low Risk: Contaminants may be present but are unlikely to be at levels to have unacceptable impact on key receptors, or pathways are likely to be minimal.
Medium Risk: Contaminants are probably present and might have an unacceptable impact on key receptors. Pathways may also be present therefore remedial measures may be necessary to reduce the risks.
High Risk – Contaminants probably or certainly present and pathways are probably also present. Therefore, contaminants are likely to have an unacceptable impact on key receptors and remedial measures are likely to be necessary to reduce the risks to acceptable levels.

5.0 PRELIMINARY GEOENVIRONMENTAL ASSESSMENT

Based on the available information, there is considered to be an overall low to medium risk with regard to human health and Controlled Waters receptors.

Although significant parts of the site are anticipated to comprise opencast backfill to between shallow and 12m depth, there is no evidence that the backfill comprised contaminated materials. The backfill is documented as comprising clay, mudstone, sandstone and shale derived from the overburden stripped off to access the coal seams (and possible shallow ironstone). However, such natural materials (assumed not to have been engineered when placed into the void) may still give rise to high levels of some heavy metals, PAHs, sulphates and ground gas.

The proposed end-use is 100% commercial and will comprise hard cover over much of the site area and thus break the majority of the source-pathway-receptor pollutant linkages to end users. However, there will be some areas of soft landscaping around road verges, landscaping bunds and newly created slopes at site boundaries. Therefore, end users and adjacent occupiers may still be at risk via inhalation of dust, dermal contact, ingestion of soil in these areas.

There is likely to be some soil gas (methane, carbon dioxide and possibly hydrogen sulphide) associated with the opencast backfill materials and, the non-engineered backfill materials are likely to have pore spaces to allow movement of such soil gas such that it could represent a risk to end users. Nearby residents are generally located to the east (down-dip) of the opencast backfilled areas and are at a lower risk from on-site sources of soil gas.

Mine gas (including methane, carbon dioxide, carbon monoxide, hydrogen sulphide) could also be present from unrecorded shallow working or deeper workings and, potentially, could migrate to the surface via old shafts or via the opencast backfill or vis old wells (if deep enough).

The nearby garage (filling station) and haulage yard have been present for a significant number of years and leaks/spills of fuel, oil etc are likely to have occurred. However, the garage is located approx. 50m to the east, which is down-dip, and the site is underlain predominantly near surface by clays, which will be of low permeability and limit lateral migration.

The small stream appears from ‘issues’ (i.e. a springline) in the southeast of the site and flows over the surface of the site into a drainage ditch before flowing off-site to the south. This appears to be at the edge of the former opencast area and the higher ground to the east (within the site boundary) over which any runoff would flow into the stream appears not to have been subject to opencast mining.

Although a Secondary A Aquifer, the Coal Measures strata at the site have been subject to shallow and deeper coal mining and it is not anticipated that this will be viewed as a key receptor. The site is not within a Source Protection Zone and the proposed development will significantly reduce infiltration rates and therefore reduce the leachate generation potential.

The other potential sources of contamination from off-site sources, including PCBs from substations and the other petrol station are considered to represent a negligible to low risk to the identified receptors due to either the distance from the site or the presence of low permeability cohesive soils or a combination of both.

6.0 PRELIMINARY GEOTECHNICAL ASSESSMENT

The presence of the opencast backfill materials at varying depths up to an anticipated 12m below ground level will have significant implications for the proposed development.

It is anticipated that the backfill materials would not have been engineered in place and therefore significant settlements could be induced once these materials are loaded with construction of buildings and/or simply raising site levels. The variable depth of the backfill and the presence of former opencast high walls could also have significant implications for differential settlements, particularly with a long slender

building being proposed in the main part of the site. With changes in site topography and drainage, the risk of inundation settlement will need to be assessed.

Significant earthworks will be required to achieve the proposed development platforms and this will involve the excavation and re-use of the backfill materials. It is anticipated that the backfill materials will be variable from clays to boulder size lumps of sandstone. Additionally, in areas outside the former opencast limits, natural Coal Measures strata, comprising clay, mudstone, siltstone, sandstone and possibly coal and ironstone may need to be excavated, processed and re-used. The coal content and calorific value of the materials to be re-used as engineered fill will need to be investigated along with the engineering properties and material classification.

There is a risk of unrecorded underground workings in the Swallow Wood seam that could potentially impact the development. This coal seam has been worked beneath or very close to the southern end of the site and should be of a workable thickness below the majority of the site, where it wasn't mined by opencast methods. The proposed site investigation should establish the presence of this coal seam at depth to inform the subsequent assessment of risk of unrecorded workings. The next worked seam is the Lidget, which is probably at a depth that should not influence the development. Further assessment of mining issues is included in the separate Coal Mining Risk Assessment report.

Both proposed cut and fill slopes within and on the opencast backfill will need careful design, taking into account slope stability and, for the fill slopes, settlement of any underlying opencast backfill materials.

Elevated concentrations of sulphates should be anticipated in the opencast backfill materials but may also be present in the natural Coal Measures strata and sulphate-resisting concrete is envisaged to be required.

7.0 RECOMMENDATIONS

A comprehensive ground investigation is recommended to confirm the anticipated ground conditions, to validate the conceptual model, to inform foundation and floor slab design, to investigate possible unrecorded workings and to assess the viability of the proposed earthworks.

A series of trial pits are envisaged to investigate the nature of the opencast backfill materials and obtain representative samples for both earthworks classification testing and chemical testing. Where the depth of the backfill is greater than that achievable by trial pitting, boreholes will be required. If, as expected, the backfill materials comprise inert natural materials derived from the overburden, large numbers of chemical tests are not considered necessary. However, as there could be elevated concentrations of naturally occurring sulphates and possibly arsenic in the opencast backfill and in situ Coal Measures strata, sufficient testing should be undertaken to appropriately classify the materials.

Trial trenches are envisaged to locate the former opencast high walls across the site.
Rotary boreholes are envisaged for geotechnical design purposes, principally focussing on the proposed locations of buildings but also to investigate the nature of

the strata in areas where significant fill is to be placed. Geotechnical laboratory testing is envisaged to comprise soil and rock classification testing, BRE SD1 sulphate testing, consolidation testing and, possibly, some effective stress testing to assist with slope stability assessments.

Further rotary boreholes should be undertaken to investigate the natural strata in areas not shown to have been subject to opencast mining to check for the possibility of unrecorded underground workings in the Dunsil and Swallow Wood coal seams or ironstone workings where within influencing distance of the surface and/or proposed development.

Some specific exploratory holes should be targeted to the parts of the site closest to the identified off-site sources of potential contamination, particularly the fuel filling station and haulage yard.

Ground/mine gas and groundwater monitoring wells should be installed throughout the site and monitoring should be undertaken to help establish groundwater levels and flow directions and the ground gas regime. Where appropriate, groundwater samples should be obtained and tested for sulphate levels and a range of commonly occurring contaminants.

This desk study/Phase I Geo-environmental Risk Assessment should be submitted (along with the Phase I Coal Mining Risk Assessment) with the Planning Application to demonstrate that the site has been adequately investigated at the pre-planning stage and that sufficient information has been obtained to design an appropriate Phase II intrusive investigation.

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GENERAL NOTES

A) The assessment made in this report is based on the site terrain and ground conditions revealed by the various field investigations undertaken and also any other relevant data for the site including previous site investigation reports (if available) and desk study data. There may be special conditions appertaining to the site, however, which have not been revealed by the investigation and which have not, therefore, been taken into account in the report. The assessment may be subject to amendment in the light of additional information becoming available. It must be recognised that many of the Environmental Searches obtained during the course of the desk study are often lengthy. Applied Geology have, where appropriate and in the interests of simplicity, only reproduced the summary of the searches within the report. A full copy of all the search data is held at the Applied Geology office and is available for inspection if required.

B) The services provided are defined within our proposal and are carried out in line with the terms of appointment between Applied Geology and the Client.

C) Where any data supplied by the Client or other external source, including that from previous site investigations, has been used it has been assumed that the information is correct. No responsibility can be accepted by Applied Geology for inaccuracies within this data.

D) Whilst the report may express an opinion on possible configurations of strata between or beyond the exploratory locations, or on the possible presence of features based on either visual, verbal or published evidence this is for guidance only and no liability can be accepted for the accuracy.

E) Comments on groundwater (and landfill gas) conditions are based on observations made during the course of the present and past investigations or with reference to published data unless otherwise stated. It should be noted, however, that groundwater (and landfill gas) levels vary due to seasonal (or atmospheric conditions) or other effects.

F) The copyright of this report and other plans (and documents prepared by Applied Geology) is owned by Applied Geology and no such report, plan or document may be reproduced, published or adapted without the written consent of Applied Geology. Complete copies of the report may, however, be made and distributed by the Client as an expedient in dealing with matters related to its submission.

G) This report is prepared and written in the context of the proposals stated in the introduction to the report and should not be used in a differing context. Furthermore, new information, improved practices and legislation may necessitate an alteration to the report in whole or in part after its submission. Therefore with any change in circumstances or after the expiry of one year from the date of the report, the report should be referred to Applied Geology for re-assessment and if necessary, re-appraisal.

H) The survey was conducted and this report was prepared for the sole internal use and reliance of the Client. This report shall not be relied upon or transferred to any other parties without the express written authorisation of Applied Geology. If an unauthorised third party comes into possession of this report they rely on it at their peril and Applied Geology owes them no duty of care and skill.

I) Ground conditions should be monitored during the construction of the works and the recommendations of the report re-evaluated in the light of this data by the supervising geotechnical or geo-environmental engineers.

J) Unless specifically stated, the investigation has not taken into account the possible effects of mineral extraction.

K) The works performed are not a comprehensive site characterisation and should not be construed as being such.

L) The findings of the geo-environmental risk assessment are based on information obtained from a variety of sources which Applied Geology believe to be correct. Applied Geology cannot and does not guarantee the authenticity or reliability of the information it has relied upon.

M) The report represents the findings and opinions of experienced geo-environmental consultants. Applied Geology does not provide legal advice and the advice of lawyers may be required.

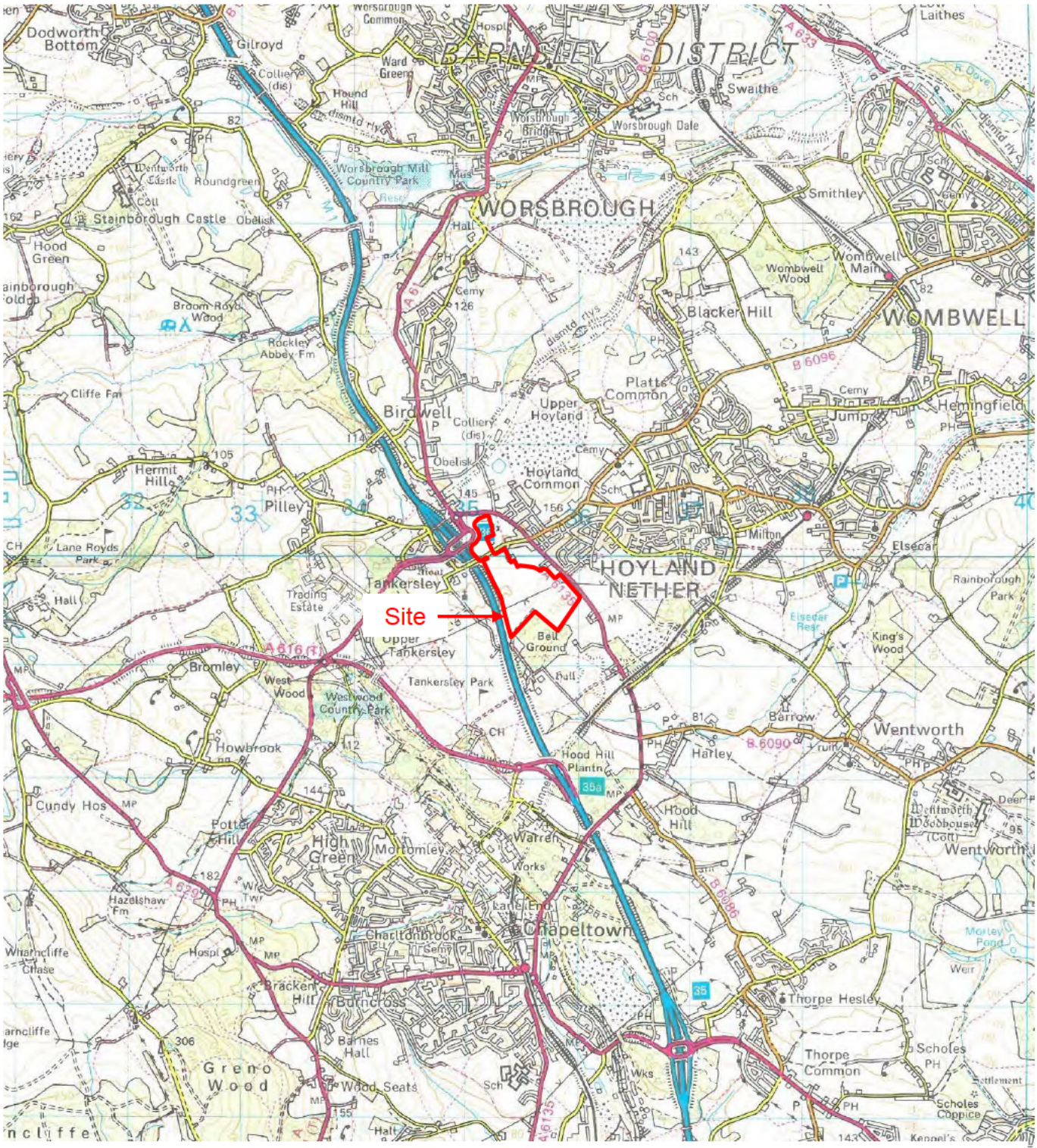
N) Conditions at the site are subject to change from the time of the site inspection.

O) It is possible that researches carried out by Applied Geology, whilst fully appropriate for a phase 1 desk study, failed to indicate the existence of important information sources. Assuming such indicators actually exist, their information could not have been considered in the formulation of Applied Geology findings and opinions.

P) The economic viability of the proposals referred to in the report, or of the solutions put forward to any problems encountered, depends on very many factors in addition to geotechnical considerations and hence its evaluation is outside the scope of this report.

Q) Applied Geology operates as a Consultancy and does not operate it's own laboratory for soil testing, this work being sub contracted to known and respected, generally UKAS accredited, laboratories. Applied Geology can therefore not be held responsible for the testing carried out.

APPENDIX A



Reproduced from the Ordnance Survey Map with permission of the Controller of Her Majesty's Stationery Office, Crown Copyright* LICENCE No: 100055022

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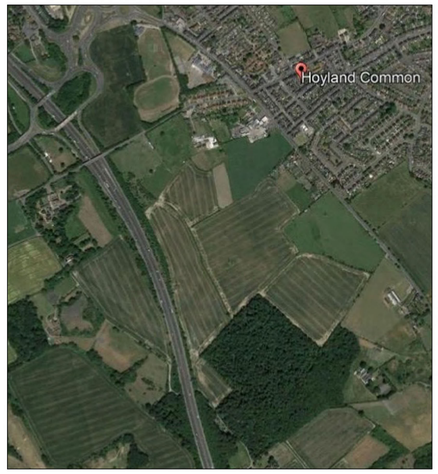
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M1 JUNCTION 36

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KEY:

Drawing based on Greenhatch, drawing 30326_T Revision 0 dated 23/05/18.

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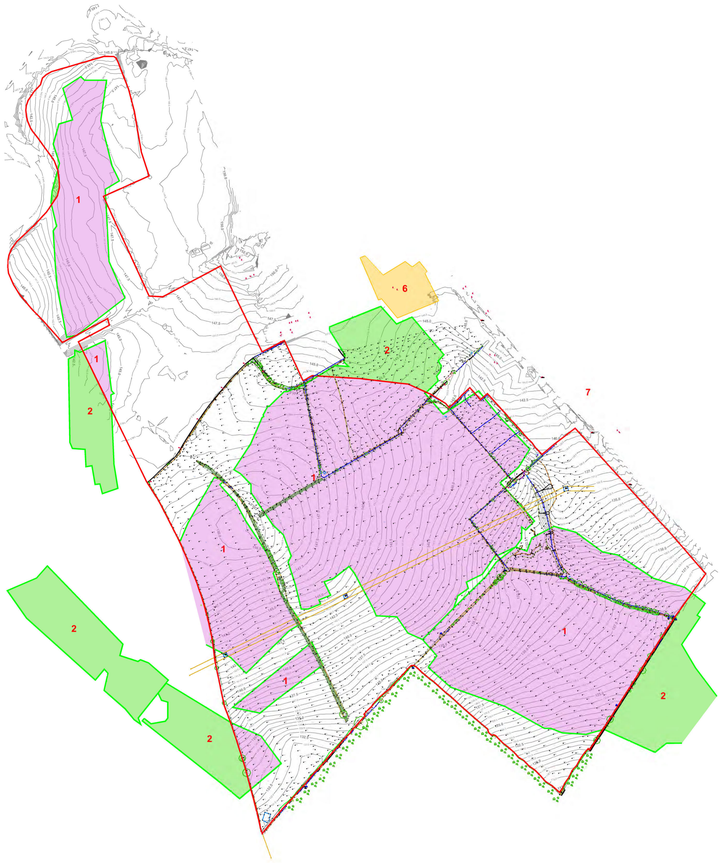
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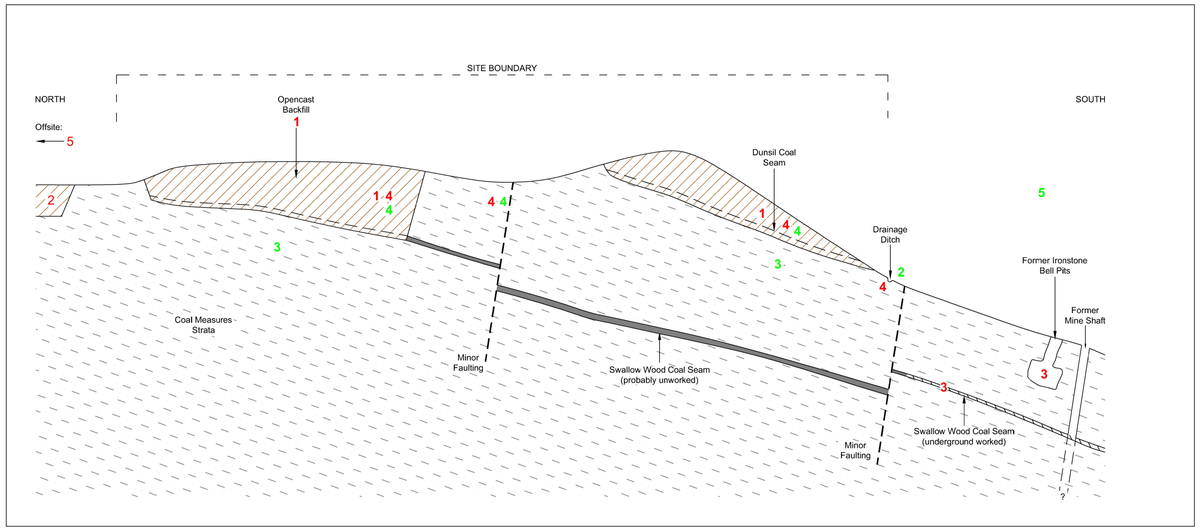
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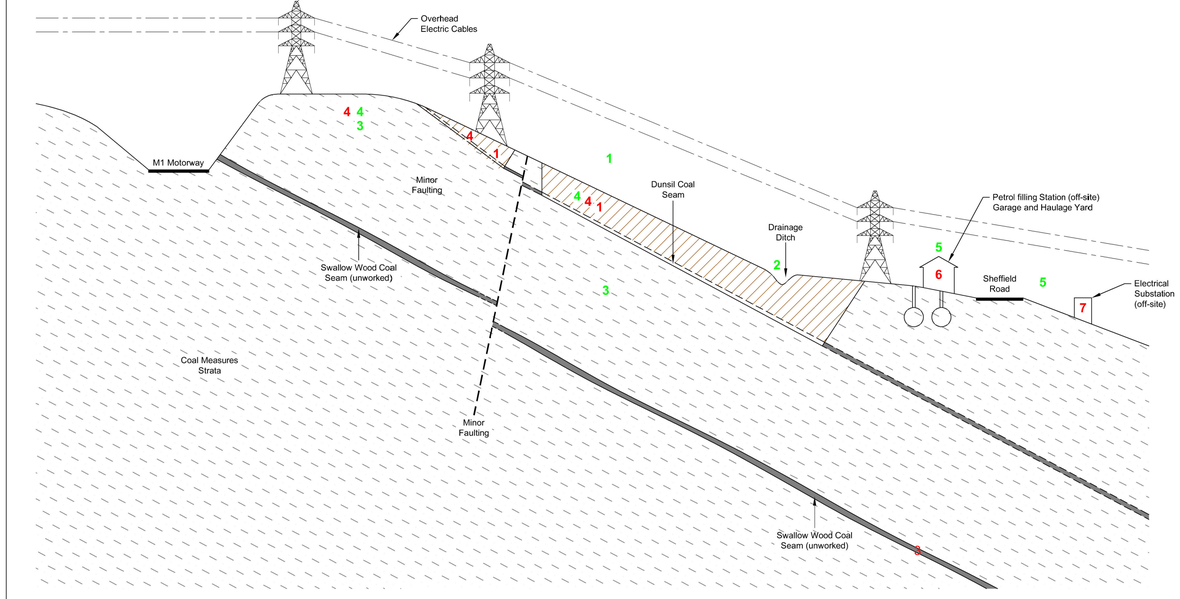
PLAN



SECTIONS (SCHEMATIC)



SECTIONS (SCHEMATIC)



Key:

SOURCES

1 Opencast backfill
2 Off-site opencast backfill and landfills
3 Mine gas
4 Sulphates
5 Former colliery, industrial and gasworks sites (off-site)
6 Petrol filling station, garage and haulage yard (off-site)
7 Electrical substation (off-site)

RECEPTORS

1 End users (industrial / commercial)
2 Drainage ditch leading to watercourse
3 Coal measures (secondary A Aquifer)
4 Building materials
5 Neighbouring properties

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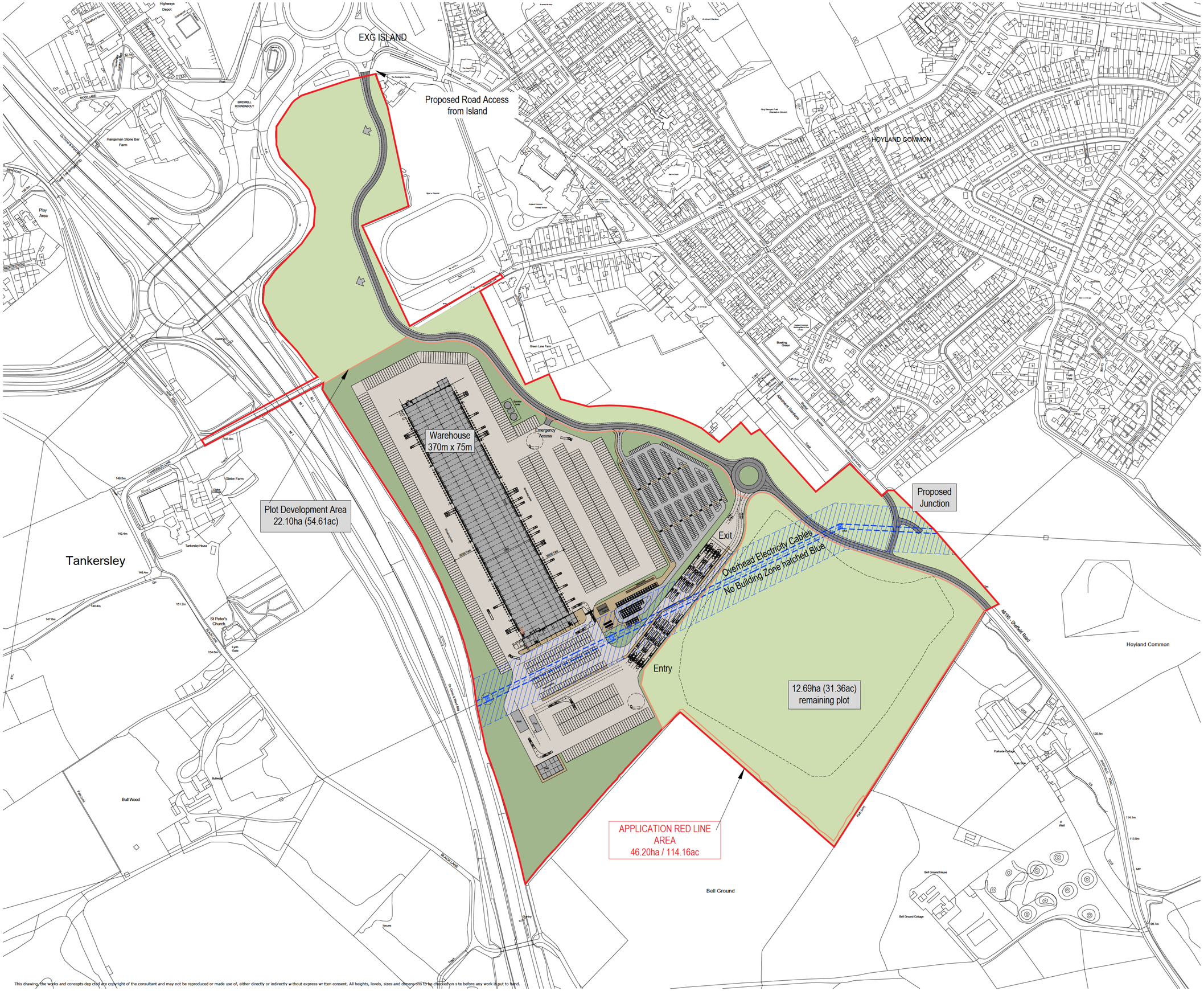
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PRELIMINARY CONCEPTUAL SITE MODEL

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SCHEDULE OF ACCOMODATION GIA

	m²	ft²
Warehouse	27,750	298,700
Office (ground)	1,164	12,529
Office (first)	1,164	12,529
Office (2nd fl, viewing etc)	465	5,000
Toilets/Comms (north end)	80	861
VMU	703	7,565
Gatehouse Type A	147	1,582
Gatehouse Type B1	24.5	264
Gatehouse Type B2	24.5	264
TOTAL	31,522	339,294

Car Parking (incl dis)	650 spaces
HGV Parking (excl doors)	608 spaces
Tractor Parking (inc Rigid Lorry 7.5t Parking, Shunter Parking, Recycle, Collection Trailers)	150 spaces
Motorcycle Parking	30 spaces
Bicycle Parking	60 spaces
Haunch Height	12.5 m
Dock Levellers	163 No.
Compactors	3 No.
Level Access Doors (Unit)	7 No.
Level Access (VMU)	3 No.

Revision:

P1	first issue	06dec2019 PL
P2	area table adjusted	10dec2019 PL
P3	HGV spaces added to North end	13dec2019 PL
P4	Overhead cables No Build zone noted	19dec2019 PL

0 50m 100m SCALE 1:2500

N

Hoyland Common
Barnsley M1 J36

newlands developments

pHp Architects
www.peter-haddon.com

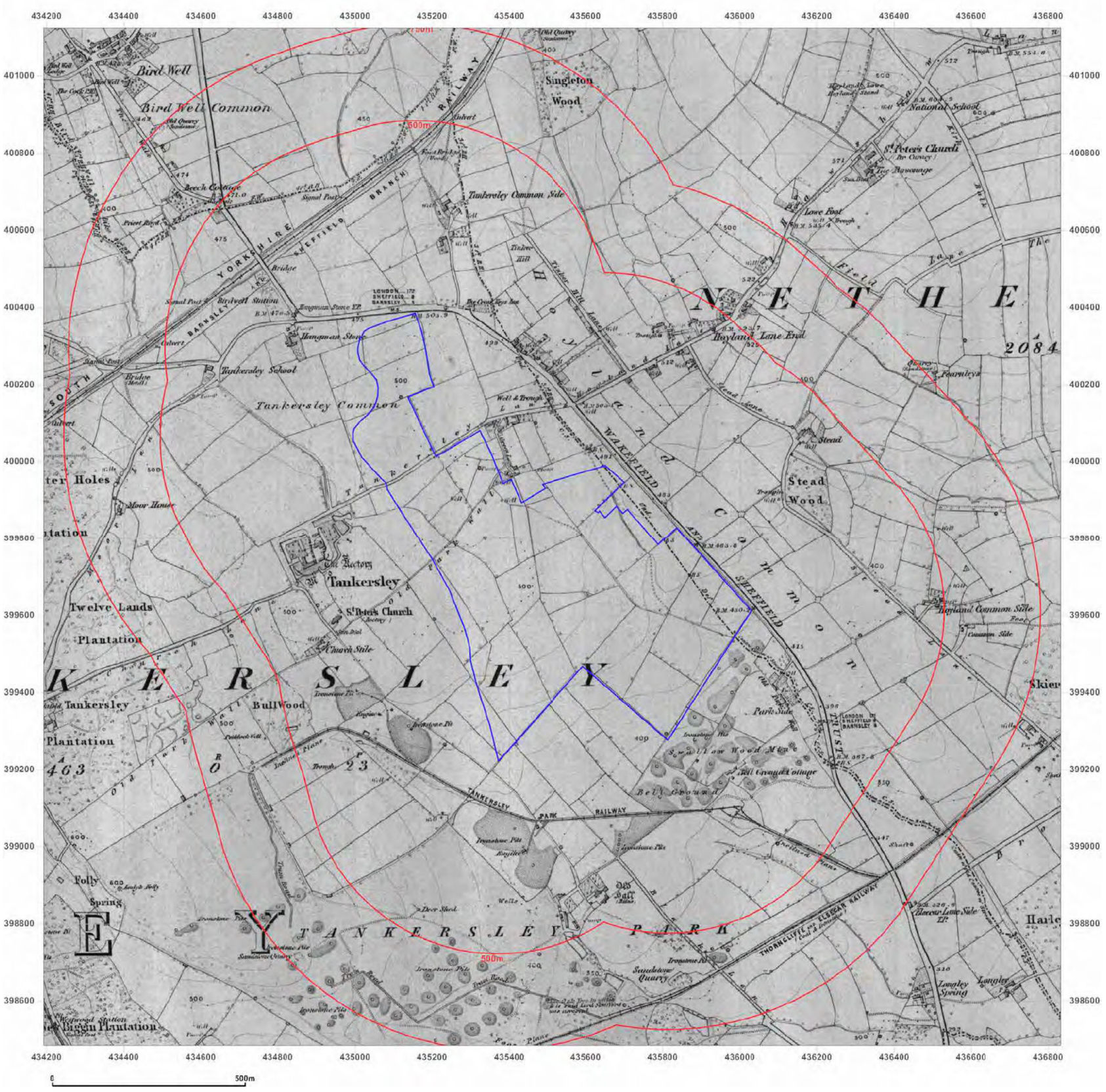
Site Plan

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Date:	dec2019
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Project No:	Drawing No:	Rev:
4400	029	P4

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APPENDIX B



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Site Details:

Hoyland Common,Barnsley ,M1 J36

Client Ref: EMS_573409_770211
Report Ref: EMS-573409_770211
Grid Ref: 435512, 399804

Map Name: County Series
Map date: **1855**
Scale: 1:10,560
Printed at: 1:10,560

N
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Surveyed 1851
Revised N/A
Edition 1855
Copyright N/A
Levelled N/A

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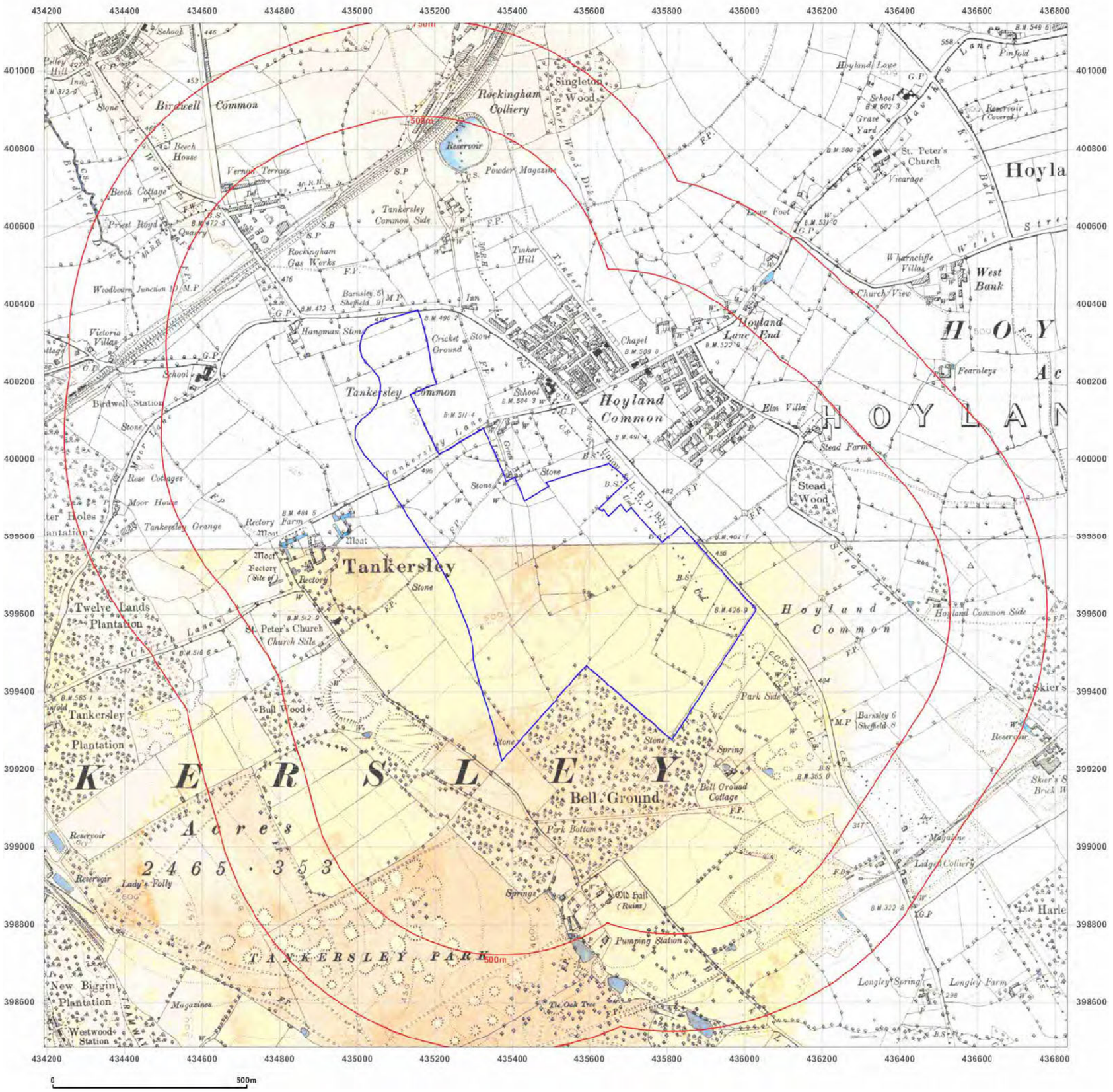
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Site Details:

Hoyland Common,Barnsley ,M1 J36

Client Ref: EMS_573409_770211
Report Ref: EMS-573409_770211
Grid Ref: 435512, 399804

Map Name: County Series

Map date: **1891-1894**

Scale: 1:10,560

Printed at: 1:10,560

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Surveyed 1891
Revised 1891
Edition 1891
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Levelled N/A

Surveyed 1891
Revised N/A
Edition 1894
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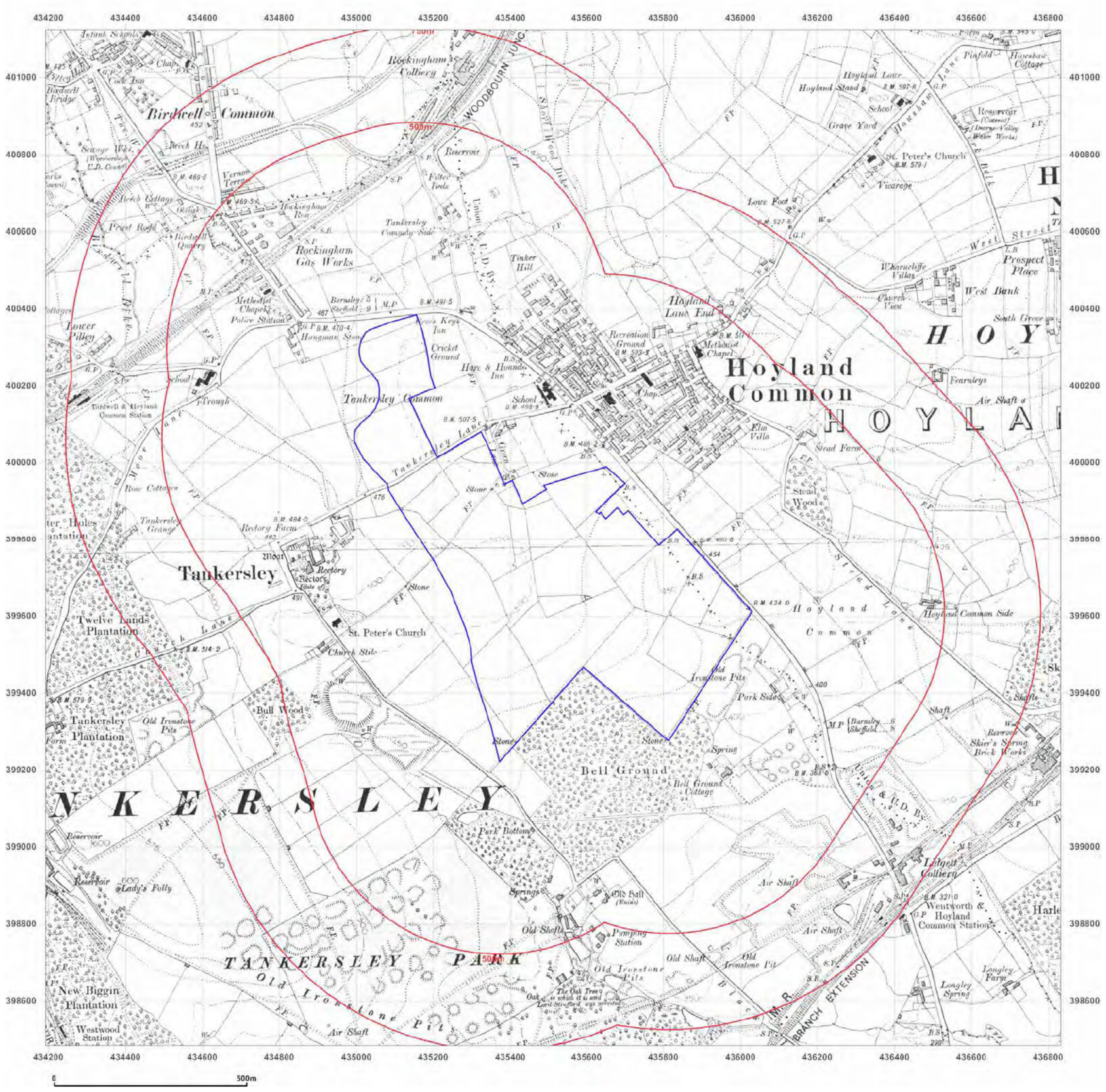
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Hoyland Common,Barnsley ,M1 J36

Client Ref: EMS_573409_770211
Report Ref: EMS-573409_770211
Grid Ref: 435512, 399804

Map Name: County Series

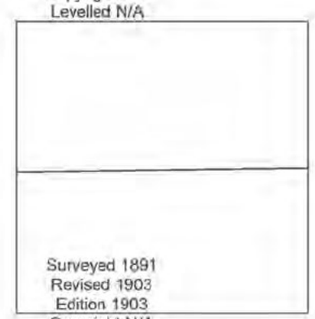
Map date: **1903**

Scale: 1:10,560

Printed at: 1:10,560

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Revised 1903
Edition 1903
Copyright N/A
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Surveyed 1891
Revised 1903
Edition 1903
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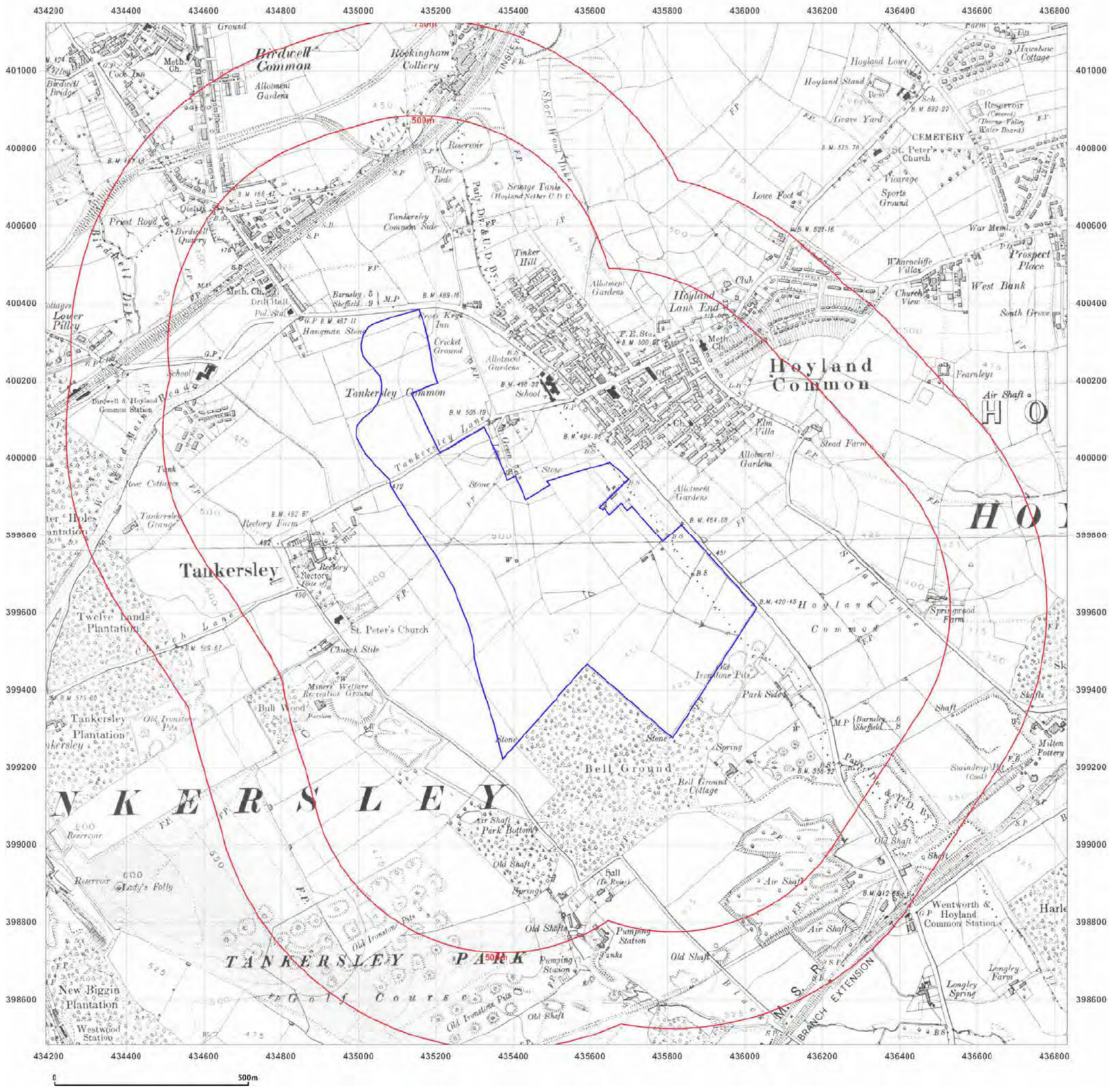
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Hoyland Common,Barnsley ,M1 J36

Client Ref: EMS_573409_770211
Report Ref: EMS-573409_770211
Grid Ref: 435512, 399804

Map Name: County Series

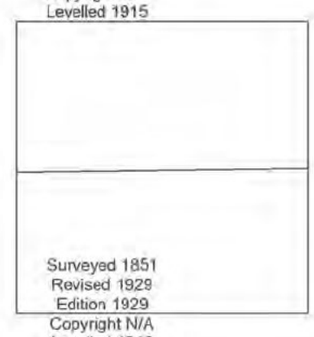
Map date: **1929**

Scale: 1:10,560

Printed at: 1:10,560

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Revised 1929
Edition 1929
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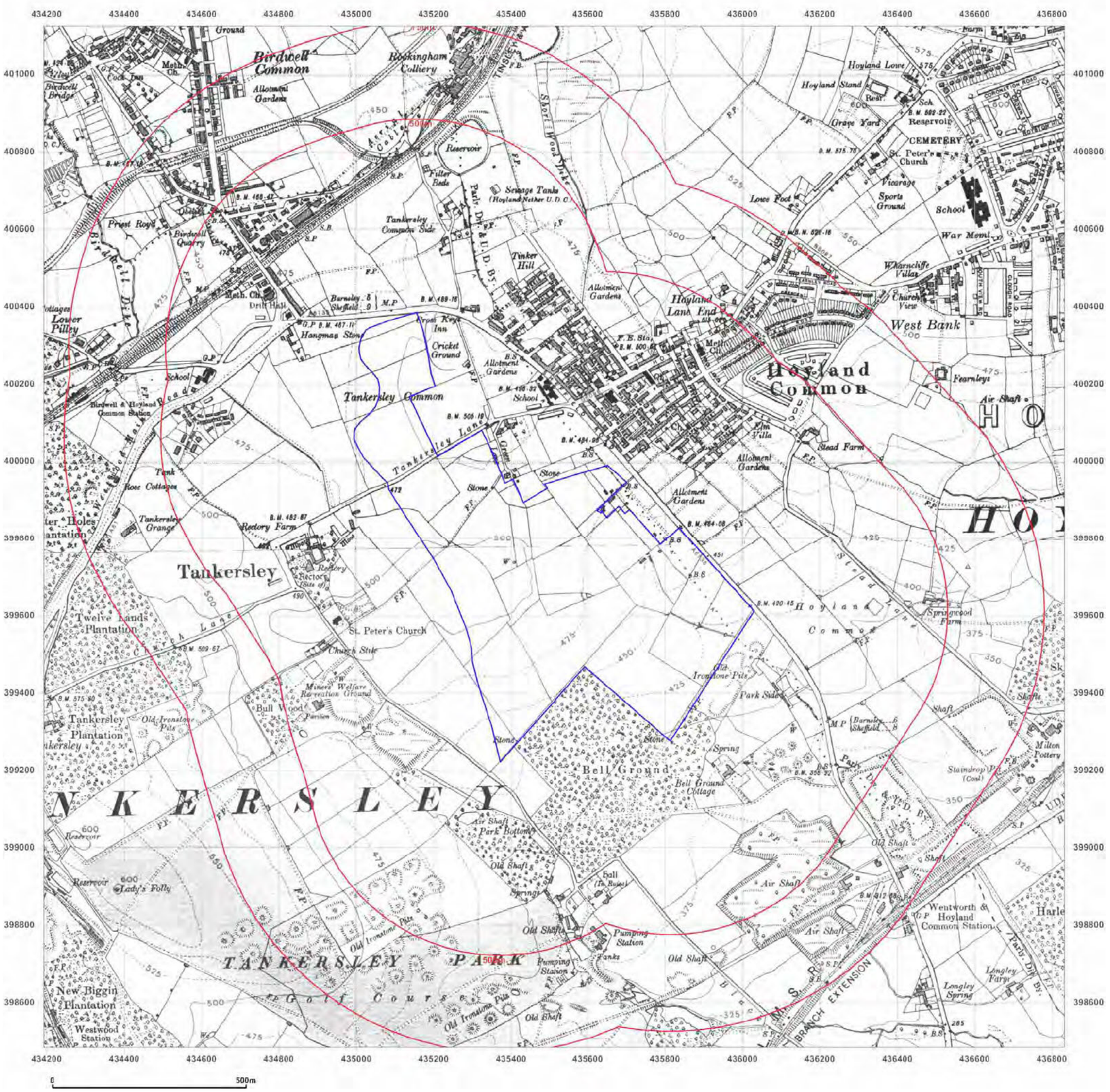
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Hoyland Common,Barnsley ,M1 J36

Client Ref: EMS_573409_770211
Report Ref: EMS-573409_770211
Grid Ref: 435512, 399804

Map Name: County Series

Map date: **1938**

Scale: 1:10,560

Printed at: 1:10,560

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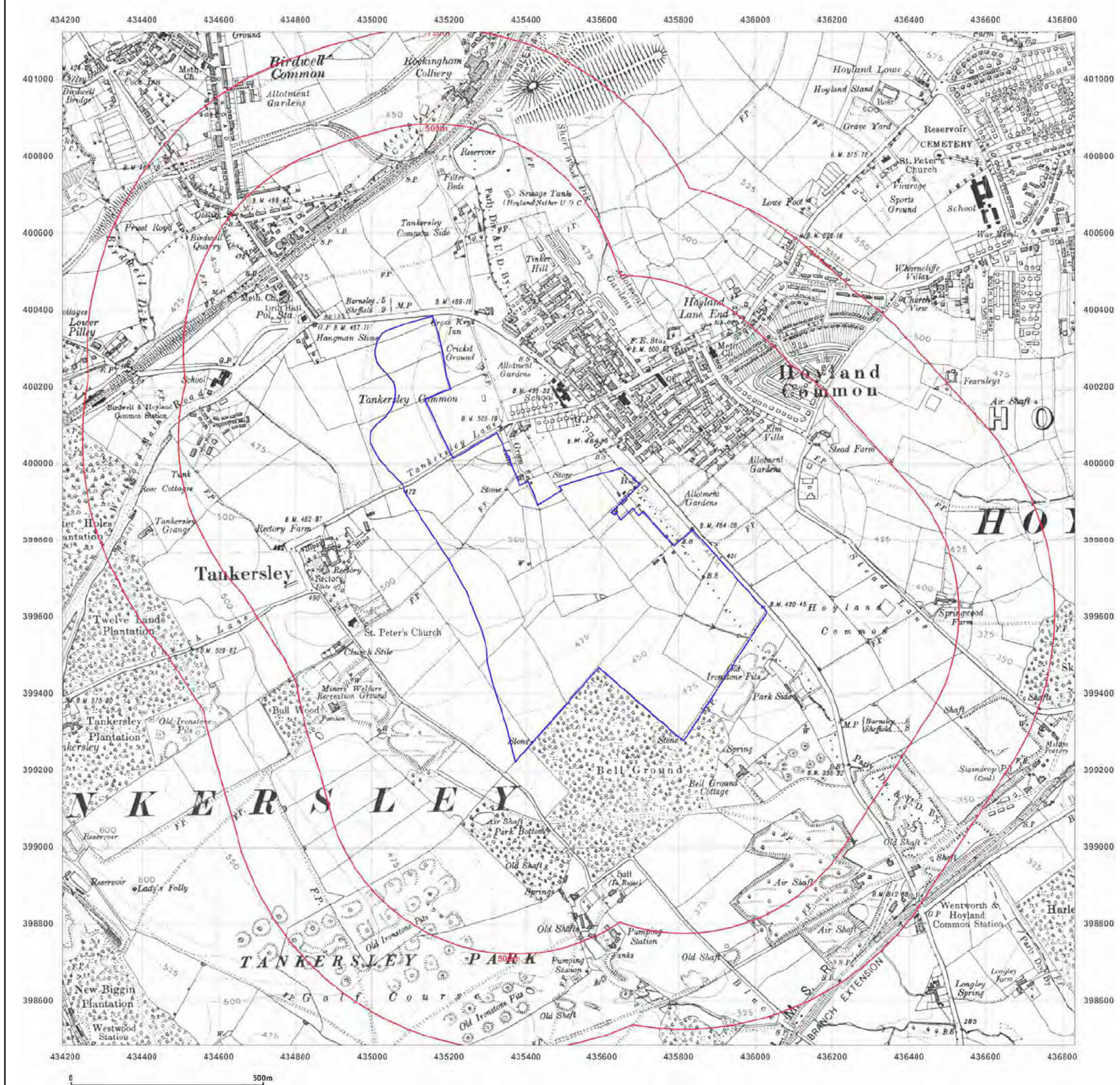
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Hoyland Common,Barnsley ,M1 J36

Client Ref: EMS_573409_770211
Report Ref: EMS-573409_770211
Grid Ref: 435512, 399804

Map Name: County Series

Map date: **1948**

Scale: 1:10,560

Printed at: 1:10,560

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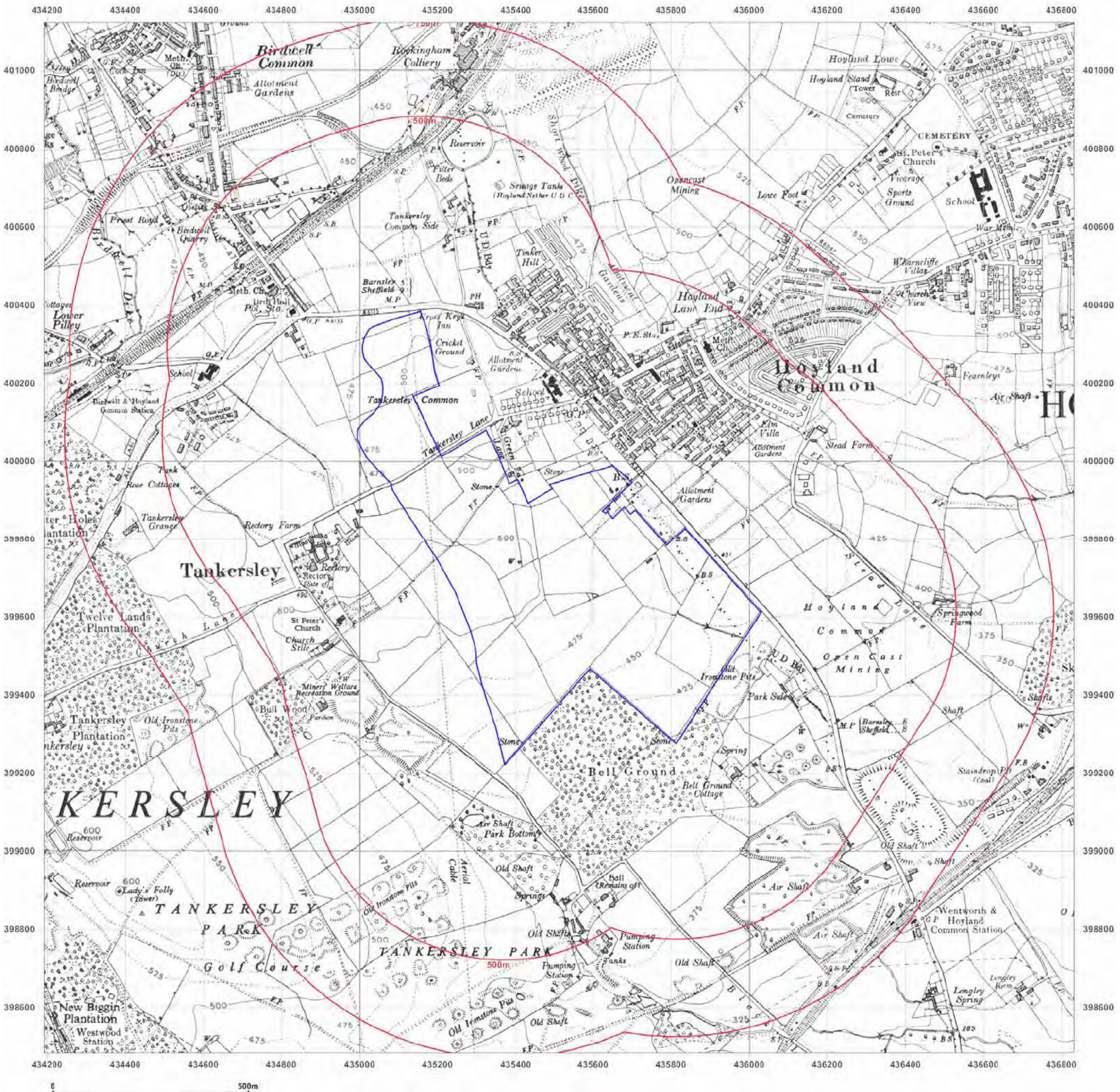
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Hoyland Common,Barnsley ,M1 J36

Client Ref: EMS_573409_770211
Report Ref: EMS-573409_770211
Grid Ref: 435512, 399804

Map Name: Provisional
Map date: **1951-1956**
Scale: 1:10,560
Printed at: 1:10,560

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