LITHOS



Preliminary Geoenvironmental Investigation

Land at Black Cats, Huddersfield

For LNT Care Developments Ltd

Report no: 5641/1A

Date: November 2025

Tel: 01937 545330 • info@lithos.co.uk • www.lithos.co.uk

SUMMARY OF GEOENVIRONMENTAL ISSUES

Job No.	5641	**Site area/ha**	0.76
Client:	LNT Care Developments Ltd	**NGR:**	SE 113 147
Site:	Black Cats, Huddersfield	**Nearest postcode:**	HD4 7AD

The site is located off Blackmoorfoot Road, approximately 3.5km southwest of Huddersfield town centre and currently comprises a single parcel of former grassland which has recently been stripped of topsoil. The site was formerly used as arable farmland.

Lithos were commissioned by LNT to provide a preliminary geoenvironmental appraisal of the site, which it is understood is to be developed with a care home.

Lithos' investigation included an inspection of historical and geological maps and information provided by the British Geological Survey, the Landmark Information Group, the Mining Remediation Authority, and QGIS. In addition, a site inspection has been carried out.

Lithos have previously issued a site investigation report for the wider site in 2023. Within the area of interest to LNT, Lithos excavated six trial pits, with soakaway testing undertaken in one pit. This Report includes a review of relevant ground data from Lithos' 2023 intrusive investigation.

A summary of salient geoenvironmental issues is provided in the table below.

Issue	Remarks
Former uses	Agricultural land.
Anticipated ground conditions	Natural ground predominantly comprises Granular Residual Soils with Sandstone bedrock encountered from depths of between 1m and 3m.
Anticipated contamination	Topsoil typically 300mm thick is present across the site. Testing suggests this material is chemically suitable for re-use.
Mining & quarrying	This site is located beyond the Mining Remediation Authority's defined coalfields. Backfilled sandstone quarries occupy c. 20% of the total wider site area. Quarry backfill was proven to depths of between 6m and 24m. The quarries targeted the Rough Rock Sandstone which was used as a construction material. The majority of the quarries were backfilled in 1960s (including Matlock House).
Hazardous gas	The site is in an area where 5% to 10% of homes are estimated to be above the action level, and basic radon protection measures are required. Based on the outcome of previous gas monitoring and risk assessment Characteristic Situation 2 (CS2) protection measures are recommended.
Flooding & drainage	The site lies in Flood Zone 1, where the risk of flooding from rivers or the sea is classified as low. Soakaway testing undertaken during previous investigation of the wider site included one test pit within the area of current interest, yielding an infiltration rate of 4.5×10^{-5} m/s. Soakaways might provide a viable solution for the disposal of surface water, subject to further testing.
Anticipated foundation solutions	Given the anticipated high line loads, it would be prudent to assume that foundations will need to be taken onto Sandstone bedrock at depths of between 1.0 and 1.5m.

This brief summary should not be assumed to represent a complete account of all the potential geoenvironmental issues that may exist at the site. As such it is strongly recommended that the report be read in its entirety.

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APPENDICES

Appendix A – General notes

01	Environmental setting

Appendix B – Drawings

Drawing	Revision	Title
5641/1	-	Site Location Plan
5641/3	-	Site Features
5641/4	-	Site Photographs
5641/5	-	Preliminary Conceptual Site Model

Appendix C - Commission

Appendix D – Historical OS plans

Appendix E – Search responses

From	Date	Content
Landmark	11/11/2025	Envirocheck report
Coal Authority	11/11/2025	Consultant's mining report

Appendix F – Relevant ground investigation data

Appendix F	TPs 519, 537 – 539, 547 & 548
	Soakaway test results

FOREWORD (GEOENVIRONMENTAL APPRAISAL REPORT)

This report has been prepared for the sole internal use and reliance of the Client named on page 1. This report shall not be relied upon or transferred to any other parties without the express written authorisation of Lithos Consulting Limited (Lithos); such authorisation not to be unreasonably withheld. If any unauthorised third party comes into possession of this report, they rely on it at their peril and the authors owe them no duty of care and skill.

This report has been reviewed by a Competent Person, as defined in the National Planning Policy Framework. We ensure that all projects are managed by individuals with necessary experience, relevant qualifications, and current membership of a relevant professional organisation. Records of engineers, project managers and reviewers involved in this project are maintained by us. Lithos QA/QC procedures for all our work forms an integral part of our ISO9001 accreditation and as such is regularly audited.

The report presents observations and factual data obtained during our site investigation and provides an assessment of geoenvironmental issues with respect to information provided by the Client regarding the proposed development. Further advice should be sought from Lithos prior to significant revision of the development proposals.

The report should be read in its entirety, including all associated drawings and appendices. Lithos cannot be held responsible for any misinterpretations arising from the use of extracts that are taken out of context. However, it should be noted that in order to keep the number of pages to a minimum, some information (e.g. full copy of the Landmark/Groundsure Report) is not included in the PDF; by request it can be provided.

The findings and opinions conveyed in this report (including review of any third-party reports) are based on information obtained from a variety of sources as detailed within this report, and which Lithos believes are reliable. Reasonable care and skill has been applied in examining the information obtained. Nevertheless, Lithos cannot and does not guarantee the authenticity or reliability of the information it has relied upon.

Where the report refers to the potential presence of invasive weeds such as Japanese Knotweed, or the presence of asbestos containing materials, it should be noted that the observations are for information only and should be verified by a suitably qualified expert.

Lithos cannot be responsible for the consequences of changing practices, revisions to waste management legislation etc that may affect the viability of proposed remediation options.

The report represents the findings and opinions of experienced geoenvironmental consultants. Lithos does not provide legal advice and the advice of lawyers may also be required.

PRELIMINARY GEOENVIRONMENTAL INVESTIGATION OF LAND AT BLACK CATS, HUDDERSFIELD

1 INTRODUCTION

1.1 The commission and brief

1.1.1 Lithos Consulting were commissioned by LNT Care Developments Ltd to carry out a Preliminary Geoenvironmental Investigation of land at Black Cats, Huddersfield.

1.1.2 Lithos have previously issued a site investigation Report (Ref. 4486/2B, December 2023) for the wider site to Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group.

1.1.3 Within the area of interest to LNT, Lithos excavated six trial pits, with soakaway testing undertaken in one pit. This Report includes a review of relevant ground data from Report 4486/2B.

1.1.4 Correspondence regarding Lithos' appointment, including the brief for this investigation, is included in Appendix C. The agreed scope of works included:

- A site walkover and inspection
- An assessment of land use history
- Determination of the site's environmental setting
- A mining risk assessment in accordance with Mining Remediation Authority[1] guidance.
- Assessment of anticipated ground conditions, including potential contaminants
- Assessment of anticipated foundation and engineering issues associated with redevelopment for a residential end-use
- Provision of recommendations for an appropriate ground investigation

1.1.5 This Preliminary Investigation comprises an inspection of historical and geological maps and information provided by the British Geological Survey, the Landmark Information Group, the Mining Remediation Authority, QGIS[2], and the Environment Agency. In addition, a site inspection has been carried out by Lithos.

1.1.6 Primary aims of this investigation were to identify salient geoenvironmental issues affecting the site to support the submission of a planning application and also to enable LNT to obtain budget costs for foundations and gas protection measures.

1.2 The proposed development

1.2.1 It is understood that consideration is being given to redevelopment of the site with a care home.

1.2.2 At the time of writing, the proposed layout had not been finalised but an L-shaped, 3-storey, 66 bed care home, with associated car parking and landscaping is proposed.

[1] *On 28th November 2024, the Coal Authority changed their name to the Mining Remediation Authority.*

[2] *An Open Source Geographic Information System used by Lithos to access publicly available Government held digital data.*

1.3 Report format and limitations

1.3.1 Standard definitions, procedures and guidance are contained within Appendix A, which includes background, generic information on assessment of the site's environmental setting.

1.3.2 General notes and limitations relevant to all Lithos preliminary investigations are described in the Foreword and should be read in conjunction with this report. The text of the report draws specific attention to any modification to these procedures and to any other special techniques employed.

2 SITE DESCRIPTION

2.1 General

2.1.1 The site's location is shown on Drawing 5641/1 presented in Appendix B to this report. Site details are summarised in the table below.

Detail	Remarks
Location	3.5 km southwest of Huddersfield town centre
NGR	SE 113 147
Area	0.76 ha (1.88 acres)
Known services	Underground electric

2.1.2 Lithos have previously issued a site investigation Report (Ref. 4486/2B, December 2023) for the wider site which extends across an area of 29.3 ha. The wider site can be divided into two distinct parcels:

- **Area A:** Fireworks Factory –comprising a range of buildings, roadways and storage yards.
- **Area B:** Agricultural land – located in the east, west and south.

2.1.3 The area of current interest lies in the south-west corner of the wider site, within the agricultural land.

2.2 Site features

2.2.1 Lithos completed a walkover survey of the site on 11th November 2025.

2.2.2 Existing salient features, at the time of the walkover are presented on Drawing 5641/3 in Appendix B to this report and summarised in the table below.

Feature	Remarks
Current access	Via existing construction site compound to the east, off Blackmoorfoot Road.
Topography	Relatively flat, falling at c. 1 in 15 to the south-east
Approximate areas	7,600m² exposed subsoil
Nature of boundaries	North, south & west - heras fencing with dry stone walls behind. East – heras fencing with wooden fencing behind.
Surrounding land uses	North – open fields. East – Vistry housing development, in progress. South - Blackmoorfoot Road. West – Felks Stile Road, with golf course beyond.

2.2.3 The site comprises a single parcel of former grassland which has recently been stripped of topsoil. The topsoil is currently being stockpiled on fields to the east of the wider construction site.

2.2.4 The site is entirely enclosed by heras fencing panels screwed to wooden posts. However, it is understood that access can be gained via a construction compound located directly east.

2.2.5 The walkover was undertaken by viewing the site from Felks Stile Road and Blackmoorfoot Road.

2.2.6 The site is relatively flat, falling at c. 1 in 15 to the south-east, but following the removal of topsoil, the site lies c. 300mm lower than surrounding land.

2.2.7 A signpost raised on metal legs is present in the southwest, advertising the future development to the public passing via Blackmoorfoot Road to the south.

2.2.8 An area of 'ponded' water is present in the southeast, likely due to recent heavy rainfall and the lack of vegetation. Two mature trees are present on the northern boundary, no further vegetation present.

2.2.9 A selection of site photographs are included on Drawing 5641/4.

3 SITE HISTORY

3.1 In order to investigate the development history and previous land uses at the site and immediate surrounding land, site centred extracts from Ordnance Survey (OS) plans dating back to 1854 have been examined. These plans are presented in Appendix D to this report.

3.2 The table below provides a summary of the salient points relating to the history of the site with respect to the proposed end use. It is not the intention of this report to describe in detail all the changes that have occurred on or adjacent to the site. Significant former uses/operations are highlighted in **bold** text for ease of reference.

Date	Site	Surrounding land
1854	A single open field, with a line of trees / hedgerows on the southern boundary.	**Waterhouse Quarry** 250m north from the site. **Crosland Hill Quarry** 350m north of the site. Un-named **sandstone quarry** 500m west from the site. Crossland house 50m east from the site.
1892	No significant changes.	Waterhouse Quarry no longer shown. Crosland Hill Quarry expanded. **Spinkwell Quarries** present 275m northeast from the site. Comprising 4 quarries and 6 spoil heaps.
1906		**Quarry & gravel pits** present 50m south of the site. Spinkwell Quarries expanded, 4 areas of 'old' quarry. Crosland Hill Quarry expanded.
1916		Quarry and gravel pits present 35m south now labelled **Moorfield quarry** and expanded. Spinkwell Quarries now shown as 'old quarries'. **Standard Fireworks Factory** developed, located in the footprint of Spinkwell Quarries. **Matlock House Quarry** from 200m northeast of the site. Quarries c.350m east expanded, now labelled **Wellfield Quarries**.
1930	Site now labelled as Moorfield farm.	Expansion of fireworks factory. Development of Crosland Heath Golf Course and club house directly west.
1938	No significant changes.	**Sands House Quarry** developed directly south. Moorfield Quarry expanded.
1960		Manor House Quarry, Wellfield Quarry & Moorfield Quarries shown as **refuse tip**. Majority of quarries backfilled as firework factory expanded west. Crosland Hill Quarry, Matlock House Quarry, Spinkwell Quarries and central quarries shown as **refuse tip**.
1984		Further expansion of firework factory. Crosland Hill Quarry appears mostly backfilled.
1999		Development of houses, gardens and estate roads 100m south at Hill Tree Park and North House Farm.
2025 (Aerial Photo)		No significant changes.

4 ENVIRONMENTAL SETTING

4.1 General

4.1.1 Notes describing how the site's environmental setting has been assessed are included in Appendix A to this report. Reference has been made to publicly available Government held digital data via QGIS (an Open Source Geographic Information System). The responses received from the Environment Agency, the Mining Remediation Authority, the BGS and extracts from the Landmark Report are presented in Appendix E.

Issue	Data reviewed	Remarks
Geology	1:50,000 BGS map (Sheet 77) 1:10,000 BGS map (Sheet SE11SW)	Drift soils – None mapped. Solid (bedrock) – Rough Rock sandstone. Shallowest coal seam – None recorded. Strata Dip - 3 ˚ to 5 ˚ east & southeast. Faults – None recorded.
Mining	Mining Remediation Authority	This site is located beyond the Mining Remediation Authority's defined coalfields.
Quarrying	Historical OS plans	Extensive quarrying within 250m.
Radon	Public Health England	The site lies in an area where 5-10% of homes are estimated to be above the action level. Therefore, basic protection measures are required.
Hydrogeology	Environment Agency electronic open data via QGIS	Source Protection Zone? None. Aquifer Secondary A aquifer (Solid). Groundwater abstractions? Crosland Heath Golf club abstracted from Millstone Grit 150m southwest, for golf course spray irrigation. Groundwater vulnerability – Secondary bedrock aquifer, high vulnerability. Pollution incidents? None recorded
Hydrology	Defra Catchment data explorer Envirocheck/ EnviroInsight Report	Nearest watercourse(s) – River Colne flows east 1km north. Water quality – ecologically moderate, chemical fail. Pollution incidents? Septic tank effluent into freshwater stream/river 100m north from the site in 1991. Abstractions? None within 1km of site. Discharge consents? None recorded.
Flood risk	Environment Agency electronic open data via QGIS	The site lies in Flood Zone 1, where the risk of flooding from rivers or the sea is classified as low.
UXO	Zetica website Or UXO Report	Low Risk

4.2 Landfills

4.2.1 Known or suspected areas of landfill in the vicinity of the proposed development site are summarised below:

NGR	Name	Remarks
SE 116 145 (**20m south**)	Wellfield Quarry Landfill	Currently accepting inert landfill to unknown depth. License holder is Johnsons Wellfield Quarries Limited, issued June 2006 by EA.
SE 110 147 (**250m north**)	Crosland Hill Quarry	Shown on the 1963 1:2,500 historical map but not recorded elsewhere. Area of landfill now used as 'burn area' and appears to have only been partially backfilled.
SE 115 146 (**250m northeast**)	Spinkwell Quarries	Shown as a refuse tip on the 1963 1:2,500 historical maps.
SE 115 145 (**342m east from the site**)	Blackmoorfoot Road (Former Matlock House Quarry)	Active between 1977 and 1988. Accepted inert and commercial waste. License held by Standard Fireworks. Appears to have only been partially backfilled. This landfill is shown in QGIS, but not the Landmark Envirocheck.

4.3 Agriculture

4.3.1 Historical plans show that the current area of interest has been occupied by arable farmland. Generally farming is not considered likely to have caused significant ground contamination. However, activities such as slurry spreading, the discharge of chemicals to ground, and unregulated burial are known to have occurred on farmland. Potential contaminants associated with farming activity could include any of the following.

Agricultural activity	Potential contaminant
Manure heaps,	Methane, metals, nitrates, oxygen depletion
Sewage farming, slurry spreading	Methane, metals, nitrates, oxygen depletion
Tracks (if built up with crushed demolition rubble etc)	Metals, asbestos, hydrocarbons
Soil conditioners	Metals, sulphates, PAH
Field sports	Lead shot
Fuel storage	Hydrocarbons, methane, oxygen depletion
Equipment maintenance	Hydrocarbons, metals
Naturally occurring contaminants	Arsenic, metals

4.3.2 Whilst it is likely that pesticides have been applied during arable use of the land, these are not likely to include the persistent organochloride pesticides such as Dieldrin, Aldrin, DDT etc. Pesticides routinely used on arable crops the UK (Phenoxy Acetic acid herbicide or PAAH) rapidly degrade in soils or leach via rainwater infiltration to groundwater. It is highly unlikely these would be detected by soil sampling and therefore it is not proposed to undertake analysis of these.

5 PREVIOUS INVESTIGATION FINDINGS

5.1 General

5.1.1 Lithos issued a site investigation report (Ref. 4486/2B) in December 2023 for c. 29.3 ha of land including, and adjacent to, the area of current interest.

5.1.2 Lithos' investigation of the wider site included an intrusive ground investigation comprising:

- 200 trial pits
- 8 soakaway tests
- 20 trial trenches
- 11 foundation pits
- 16 window sample boreholes
- 50 probeholes & stitch lines
- 33 gas \ groundwater monitoring wells

5.1.3 Within the area of interest to LNT, Lithos excavated TPs 519, 537 – 539, 547 & 548. Soakaway testing was undertaken in TP519. Logs and soakaway test results are included in Appendix F.

5.2 Summary of findings

5.2.1 Within the area of current interest, **made ground** was only encountered in two trial pits (TP538 & TP547) in the far south of the field adjacent to Blackmoorfoot Road and Felks Stile Road. This made ground comprised:

- **Made Ground Topsoil** – Encountered in both TP538 & TP547 from surface to 0.3m depth comprising dark brown, clayey, silty, fine to coarse Sands with rare sandstone gravel.
- **Granular Made Ground** – Encountered between 0.3m and 1.3m in TP538 and between 0.3m and 0.7m in TP547 comprising dark greyish brown, very silty, fine to medium Sands with gravel and cobbles of sandstone.

5.2.2 **Natural ground** was encountered in all 6 trial pits and typically comprised Granular Residual Soils (a fine to coarse Gravel of sandstone, with a low to medium cobble content) overlying Sandstone bedrock.

5.2.3 Ground conditions encountered are summarised in the Table below:

Hole	Final depth	Depth to Base of Made Ground (mbgl)	Depth to Base of: (mbgl)			Depth to Rough Rock Sandstone (mbgl)	Penetration (m)*
			Made Ground Topsoil	Natural Soils			
				Topsoil	Granular Residual Soil		
TP519	1.7	-	-	0.3	1.5	1.5	0.2
TP537	1.6	-	-	0.2	1.1	1.1	0.5
TP538	2.0	1.3	0.3	-	-	1.3	0.7
TP539	1.6	-	-	0.3	1.1	1.1	0.5
TP547	1.4	0.7	0.3	-	1.2	1.2	0.2
TP548	1.3	-	-	0.4	1.0	1.0	0.3

5.2.4 The stability of excavations within natural strata was generally good.

5.2.5 No significant inflows of groundwater were encountered during the investigation.

5.2.6 The soakaway testing in TP 519 included two fills, yielding infiltration rates of 4.2 to 4.7 x10^{-5} m/s.

5.2.7 No visual or olfactory evidence of hydrocarbon contamination was recorded.

5.2.8 Topsoil typically 300mm thick is present across the site. Testing of 26 topsoil samples recovered from the wider site (agricultural field) suggests this material is chemically suitable for re-use. Topsoil has already been stripped and stockpiled on fields in the east of the wider construction site.

5.2.9 A period of gas monitoring 9 visits over 6 months was undertaken between October 2023 and April 2024; see Section 6.

5.3 Detailed UXO Risk Assessment

5.3.1 The term UXO refers to any unexploded ordnance which may occasionally be encountered within the ground. UXO is typically divided into 1 of 3 categories:

- Land Service Ammunition (LSA)- Fired, thrown or placed from a land-based gun (larger than a machine gun)/mortar/person. Includes bullets, shells, mortars and grenades.
- Small Arms Ammunition (SSA) – Fired from a machine gun & smaller. Comprises bullets.
- Air Dropped Weapons – Fired from a plane/blimp. Includes bombs, incendiaries, missiles and rockets in a variety of sizes (<25kg to >1ton).

5.3.2 UXO presence is generally caused by one of the following:

- German bombing of Britain during WW1 and WW2
- Anti-Aircraft batteries used to counter German attacks during WW2
- Military training and exercises from 1700's to present day
- Ordnance manufacture from 1700's to present day. Most intensively during WW1 (Kings Ordnance factories) and WW2 (National filling factories).

5.3.3 Whilst UXOs are generally stable (buried bombs are often considered to be as stable as the day they were dropped), disturbance by excavation, impact, vibration or heat can activate and detonate a hidden UXO. It is therefore important to try to avoid impact and disturbing bombs in the ground.

5.3.4 Although the wider site is shown to lie within a UXO Low Risk Area, it was considered prudent to obtain a Stage 2 Detailed UXO Risk Assessment given the association with manufacture of explosives during the first and second world wars at the firework factory adjacent to the site.

5.3.5 A non-intrusive magnetometer survey of the greenfield land surrounding the site (which includes the current area of interest here) was recommended.

5.3.6 Findings of the target investigation report indicate that Brimstone and the client satisfied the criteria of CIRIA C681 and other standards in the completion of the survey and have successfully mitigated the risks posed by UXO to ALARP.

5.3.7 Clearance has been given for the site (including the current area of interest) to a depth of 4m below ground level. Any intrusion greater than this depth are not cleared and may require additional mitigation measures being put in place such as piling and drilling operations.

6 HAZARDOUS GAS

6.1 Radon

6.1.1 Requirements with respect to radon measures are set out in Building Regulations Approved Document C. Probability bandings (based on the proportion of properties in a given area that exceed the Action Level; currently 200 Bq.m^{-3}) are used to determine whether a property requires no, basic or full measures.

6.1.2 At present Approved Document C advocates basic measures for the probability banding 3% to 10% (full measures if >10%). However, the UK Health Security Agency (HSA) would like to see all new build include basic measures.

6.1.3 In December 2022, the British Geological Survey (BGS), deployed a revised dataset which increased accuracy and also the number of properties falling within radon affected areas. This revised dataset is now referenced by maps on the HSA website.

6.1.4 The HSA website radon map indicates that the site is in an area where **5% to 10%** of homes are estimated to be above the action level, and **basic** radon protection measures are required in new dwellings.

6.1.5 Basic radon measures comprise a radon resistant barrier* (membrane) laid within the floor construction and across the wall cavity in accordance with BR211:2023[3]. The joints between the sheets that form the membrane and cross the cavity **must** be sealed, along with all service penetrations, to make the construction as airtight as possible. A separate cavity tray should be installed in the cavity one brick course above the radon membrane. In order to withstand the installation and follow on construction process membranes should be no less than 400 microns thick.[4]

6.1.6 BRE211:2023 highlights the importance of good practice and a high standard of workmanship to ensure radon membranes are installed to a high standard.

6.1.7 A building site is a harsh environment and barriers can easily become damaged during construction by operatives or equipment moving across or working over a completed section of barrier. As a consequence, where there is a risk of puncturing the membrane, it should be ensured that the membrane is well protected with sand or lean mix concrete before advancing construction.

6.1.8 The radon protection system should be subject to inspection and verification by a third party inspector that has a full understanding of all elements of the radon protection system.

6.1.9 Verification should be carried out at a minimum frequency of 1 in 10 plots where groundworkers carry out installation, and 1 in 20 plots where accredited installers are used. Plots selected for inspection should be located across the development and not clustered.

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[3] *BRE Report BR211, 2023: "Radon: guidance on protective measures for new buildings (including supplementary advice for extensions, conversions and refurbishment projects"*

* *Confirmation of resistance to radon must be obtained from the manufacturer.*

[4] *BS8485:2015+A1:2019. Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings. January 2019.*

6.2 Methane & carbon dioxide

6.2.1 The site might be affected by sources of hazardous gas generation as it is:

- Located within 250m of known former & current landfill sites
- A number of **infilled quarries** are present within the wider site

6.2.2 A period of gas monitoring 9 visits over 6 months was undertaken between October 2023 and April 2024 across the wider site. This included Piezos 132 & 133 within the current area of interest.

6.2.3 Subsequent gas risk assessment concluded that Characteristic Situation 2 (**CS2**) gas protection measures should be incorporated within all new build.

6.3 Scope of protection measures

6.3.1 In accordance with Table 3 and Section 7 of BS8485:2015, the proposed care home is considered to be Building Type C (a property with central building management control of structural alterations and building maintenance). Therefore, the following protective measures should be incorporated:

Charac. situation (Wilson & Card, '99)	Gas "score" req'd by BS8485	Protective measures (Residential)		
		Floor slab (BS8485 "score")	Sub-floor ventilation (BS8485 "score")	Membrane Type (BS8485 score")
2	C = 2.5	*Select one from:* Reinforced ground bearing slab – (0.5). Reinforced, cast in-situ suspended slab (with minimal and suitably sealed service penetrations & joints) – (1.5). Reinforced ground bearing raft (with limited service penetrations cast into slab). Note: the venting area through any downstand beam should be 3 times greater that provided by the side ventilation (air bricks) – (1.5).	For smaller commercial units, passive sub-floor ventilation; venting layer could be: A min. 150mm clear void (2.5), or A proprietary void former providing an equivalent clear void depth of 60mm; see Section B7 in BS8485:2015 (2.5), or Min. 300mm thick blanket of min. 20mm single size gravel (1.5). Min. ventilation = 1,500 mm^2/m run of external wall (via air bricks on each of 2 opposite sides), with 100mm pipes at 1.75m centres or honeycombing of any sub-floor sleeper walls.	Gas resistant membrane meeting all of the following criteria: • sufficiently impervious to gases with a methane gas transmission rate <40.0 ml/day/m^2/atm (average) for sheet and joints (tested in accordance with BS ISO 15105-1 manometric method); • sufficiently durable to remain serviceable for the anticipated life of the building and duration of gas emissions; • sufficiently strong to withstand in-service stresses (e.g. settlement if placed below a floor slab); • sufficiently strong to withstand the installation process and following trades until covered (e.g. penetration from steel fibres in fibre reinforced concrete, penetration of reinforcement ties, tearing due to working above it, dropping tools, etc); • capable, after installation, of providing a complete barrier to the entry of the relevant gas; • a minimum 0.4 mm thickness (1600g polyethylene) reinforced membrane (virgin polymer); and • verified in accordance with CIRIA C735 • (2.0)

Footnotes:

∞ In accordance with CIRIA C735, a Verification Plan should be prepared which outlines the activities (inspection and testing), the relevant personnel, and the type of records to be collected. Gas membranes need to be visually inspected to establish possible damage. Whilst conflicts of interest in verification should be avoided, the Developer's staff on site could undertake inspection & verification on CS2 & CS3 sites. In all circumstances, the verifier should be competent, experienced and suitably trained.

1. Building Types are defined in Table 3 and Section 7 of BS8485:2015. B = Property with central building management control of structural alterations, but not building maintenance. **C** = Property with central building management control of structural alterations and building maintenance. D = Industrial building with well ventilated, large internal space(s).
2. A combination of two or more of the three types of protection measures (slab, ventilation & membrane) should be used to achieve the BS8485 score.
3. The membrane should always be lapped and sealed and be continuous across internal walls & the cavity. There should be a cavity tray in external walls.
4. In all cases there should be minimum penetration of floor slab by services; any penetrations should be suitably sealed.

6.3.2 In general accordance with CIRIA C735[5], YALPAG[6] and NHBC guidance[7] a Gas Protection Strategy and Verification Plan (Design Report and Construction Drawings) should be prepared which detail site specific requirements for the gas protection system with respect to the development.

6.3.3 The Design Report should include details which specify the required verification for all elements (design and installation) of the gas protection system. The report should be issued to NHBC and Kirklees Council in advance of the construction phase.

6.3.4 Independent third party verification (i.e. not by the installer or any associated company) of gas protection measures is required in accordance with the guidance, which as a minimum should include visual inspection. In all cases the verifier should be competent, experienced and suitably trained. As stipulated in the CIRIA guidance the frequency of verification will be dictated by the experience of the installer.

6.3.5 BRE\Environment Agency Report BR 414 (2001) – "*Protective Measures for housing on gas-contaminated land*" provides a practical guide to good practice for the detailing and construction of passive soil gas protection measures for new residential development. Of particular relevance are a list of 'Watchpoints', which offer practical information for installation and buildability.

[5] *Good practice on the testing and verification of protection systems for buildings against hazardous ground gases. CIRIA C735, 2014.*

[6] *Verification Requirements for Gas Protection Systems - Technical Guidance for Developers, Landowners and Consultants. Yorkshire and Lincolnshire Pollution Advisory Group, December 2016.*

[7] *Hazardous ground gas – as essential guide for housebuilders. NHBC Foundation, April 2023*

7 CONCEPTUAL SITE MODEL

7.1 Assessment of contaminated land is based on an evaluation of pollutant linkages (Source-Pathway-Receptor).

7.2 A conceptual site model, presented as Drawing 5641/5, has been prepared after consideration of all the data presented in Sections 2 to 6 inclusive of this report.

8 LAND CONTAMINATION – PART IIA & PLANNING

8.1 Local Authorities have responsibilities with respect to land contamination in the context both of Part IIA of the Environmental Protection Act 1990, and Planning.

8.2 The contaminated land regime in Part IIA was introduced specifically to address the historical legacy of land contamination. It applies where there is unacceptable risk, assessed on the basis of the **current** use and the relevant circumstances of the land. It is not directed to assessing risks in relation to a future use of the land that would require a specific grant of planning permission. This is primarily a task for the planning system, which aims to control development and land use in the **future**.

Planning

8.3 The National Planning Policy Framework (NPPF), supported by web-based planning practice guidance, includes the following with respect to contamination and site investigation:

"*Where a site is affected by contamination or land stability issues, responsibility for securing safe development rests with the developer and/or landowner*".

8.4 Planning policies and decisions should ensure that:

- The site is suitable for its new use taking account of ground conditions and land instability, including from natural hazards or former activities such as mining, pollution arising from previous uses, and any proposals for mitigation including land remediation or impacts on the natural environment arising from that remediation
- After remediation, as a minimum, land should not be capable of being determined as contaminated land under Part IIA of the environmental protection act 1990
- Adequate site investigation information, prepared by a competent person, is presented'

8.5 Annex 2 of the NPPF states that 'all investigations of land potentially affected by contamination should be carried out in accordance with established procedures (such as BS10175[8])'.

This site

8.6 The underlying Rough Rock sandstone is classified as a Principal A aquifer. The nearest surface watercourse is the River Colne, which flows in an easterly direction, approximately 1km beyond the site's northern boundary. Therefore, the site's environmental setting is considered to be of moderate sensitivity.

8.7 With respect to human health, the proposed end use (care home) is sensitive.

8.8 Previous use of the site is considered has not given rise to any significant ground and groundwater contamination.

[8] *BS10175 (2011) - Code of practice for the investigation of potentially contaminated sites*

9 CONCLUSIONS & RECOMMENDATIONS

9.1 General

9.1.1 The site comprises c. 0.76 hectares of arable farmland from which topsoil has recently been stripped. Review of Historical plans shows no previous site uses, other than farming.

9.1.2 It is understood that LNT are considering acquisition of the site with a view to development with a care home.

9.1.3 The main issues considered in this report are based on a review of historical maps, available geological/environmental information and ground data obtained during intrusive investigation of the wider site.

9.1.4 This report provides an assessment of geoenvironmental issues and implications associated with the proposed residential redevelopment of the site.

9.2 Mining and quarrying

9.2.1 This site is located beyond the CA's defined coalfields.

9.2.2 Backfilled sandstone quarries occupy c. 20% of the total wider site area. The quarries targeted the Rough Rock Sandstone which was used as a construction material.

9.2.3 The majority of the quarries were backfilled in 1960s. Quarry backfill was proven to depths of between 6m and 24m.

9.2.4 No evidence of underground workings in the sandstone has been encountered. However, the presence of adits driven from the base of the quarries cannot be entirely ruled out.

9.3 Hazardous gas

9.3.1 The site is in an area where 5% to 10% of homes are estimated to be above the action level, and basic radon protection measures are required in new dwellings.

9.3.2 A period of gas monitoring was carried out across the wider site between October 2023 and April 2024. Subsequent gas risk assessment concluded that Characteristic Situation 2 (**CS2**) protection measures should be incorporated within all new build.

9.4 Foundations

9.4.1 It is understood that consideration is being given to redevelopment of the site with a 3 storey '**L**'-shaped care home, with associated parking and landscaped areas.

9.4.2 The care home is expected to impart a maximum line load of 200kN per m run.

9.4.3 It is considered that shallow strip or deepened trench fill footings will be the most suitable foundation solution for the proposed 3 storey care home.

9.4.4 Given the anticipated high line loads, it would be prudent to assume that foundations will need to be taken onto Sandstone bedrock at depths of between 1.0 and 1.5m.

9.4.5 A safe bearing capacity of at least 340kPa, allowing a maximum foundation line load of 90kN/m run, can be assumed if the following are true:

- A foundation length of 10m
- A foundation breadth of 0.6m
- A foundation thickness of 225mm
- A foundation depth of 1.2m depth
- An angle of shearing resistance of ϕ=34° for the granular deposits

9.4.6 Assuming the foundation geometry detailed above, minimal settlements would be anticipated.

9.4.7 Foundations should be placed entirely on rock and not partially on rock and partially on soil. This may, depending on surface gradient, necessitate significant deepening of foundations.

9.4.8 Foundations will be required to be placed below a line drawn up at 45° from the base of any service or similar excavation.

9.5 Highways and external works

9.5.1 Given the relatively level nature of the site, there should be no requirement for retaining walls, underbuild, tanking etc.

9.5.2 Granular residual soils (completely weathered bedrock) should yield a CBR of at least 5%. This value should be verified prior to or during construction.

9.6 Soakaways & drainage

9.6.1 Soakaway testing undertaken during previous investigation of the wider site (see Section 5) included one test pit (TP519, two fills) within the area of current interest, yielding infiltration rates of 4.2 to 4.7 $x10^{-5}$ m/s.

9.6.2 Soakaways might provide a viable solution for the disposal of surface water, subject to further testing.

9.6.3 Alternative SUDS options (see CIRIA C753[9] for further details) include:

- Pervious Pavements – provide a surface suitable for pedestrian and/or vehicular traffic, while allowing rainwater to infiltrate into subsurface storage, with subsequent infiltration or controlled discharge. Pavement could be porous (water able to infiltrate across entire surface material; e.g. reinforced grass), or permeable (water infiltrates via joints between concrete blocks).
- Swales – linear grassed features in which surface water can be stored or conveyed. Where suitable, swales can be designed to allow infiltration.

9.6.4 Yorkshire Water have published a guide[10] for developers and designers outlining their design requirements for surface water attenuation assets. However, further to changes in drainage policy over recent years, independent water authorities (including IWNL, ICOSA, LEEF etc) now adopt more housing schemes than the traditional authorities such as Yorkshire Water. Consequently, CIRIA C753 has become the more commonly used guidance for the design of SuDS features (including attenuation assets).

[9] *CIRIA C753 (2015) – The SuDS Manual.*

[10] *Design Requirements for Surface Water Attenuation Assets, February 2017.*

9.6.5 With respect to detention basins and soakaway tanks, whilst CIRIA C753 does not include explicit guidance on the frequency\duration of groundwater monitoring, it is generally accepted that water table levels should be taken from borehole monitoring wells over 4 consecutive seasons, for at least 3 points in the basin\tank area.

9.7 Contamination

9.7.1 The site's environmental setting is considered to be of moderate sensitivity. With respect to human health, the proposed end use (residential) is also sensitive.

9.7.2 The site is essentially greenfield, and analysis of topsoil samples recovered from the wider site (agricultural field) suggests this material is chemically suitable for re-use.

9.7.3 Topsoil has already been stripped and stockpiled on fields in the east of the wider construction site.

9.8 Potential development constraints

9.8.1 Some deterioration of the surface is likely to be caused by trafficking, especially after topsoil has been stripped and during/after periods of significant rainfall. Consequently, it would be prudent to consider placement of a minimum 200mm thickness of suitable granular fill (i.e. a "blanket" of 6F2) along the line of proposed highways and any temporary haul roads to protect formation during the construction phase.

9.8.2 Enquiries should be made with existing utility providers with regards to their assets in the vicinity of the site and the appropriate easement or diversion works that may be required.

Appendix A

General Notes

01 - Environmental setting
Generic notes – geoenvironmental investigations

General

Third party information obtained from the British Geological Survey (BGS), the Coal Authority, the Local Authority etc is presented in the "Search Responses" Appendix of this Geoenvironmental Report.

Geology, mining & quarrying

In order to establish the geological setting of a site, Lithos refer to BGS maps for the area, and the relevant geological memoir. Further information is sourced by reference to current and historical OS plans.

In July 2011, the Coal Authority (CA) formalised their requirements in relation to planning applications and introduced some new terminology. The CA, using its extensive records has prepared plans for all coalfield Local Planning Authorities, which effectively refines the defined coalfield areas into High Risk and Low Risk areas. **High Risk** areas are likely to be affected by a range of legacy issues that pose a risk to surface stability, including: mine entries; shallow coal workings; workable coal seam outcrops; mines gas; and previous surface mining sites. **Low Risk** areas comprise the remainder of the defined coalfield, and are areas where no known defined risks have been recorded; although there may still be unrecorded issues. Where a site lies within either a High or Low Risk area, a mining report is obtained from the CA.

Landfills

Reference is made to publicly available Government held digital data via **QGIS** (an Open Source Geographic Information System), data from Landmark or Groundsure, and sometimes the Environment Agency and the Local Authority with respect to known areas of landfilling within 250m of the proposed development site.

Historical OS plans are also inspected for evidence of backfilled quarries, railway cuttings, colliery spoil tips etc.

Radon

Radon is a colourless, odourless gas, which is radioactive. It is formed in strata that contain uranium and radium (most notably granite), and can move though fissures eventually discharging to atmosphere, or the spaces under and within buildings. Where radon occurs in high concentrations, it can pose a risk to health.

In order to assess potential risks associated with radon gas, Lithos refer to BRE Report BR211[1], and the UK Health Protection Agency (HPA) website. In December 2022, the British Geological Survey (BGS), deployed a revised dataset which increased accuracy and also the number of properties falling within radon affected areas. This revised dataset is now referenced by maps on the HSA website.

Advice on the limitation of exposure of the population to radon in buildings was originally published in 1990 by the National Radiological Protection Board (NRPB), which joined the HPA in 2005; the HPA updated NRPB advice in July 2010[2].

The HPA recommended that the NRPB radon Action Level for homes be retained, and a new Target Level for radon in homes be introduced. The values of the Action Level and Target Level, expressed as the annual average radon concentration in the home, are 200 Bqm^{-3} and 100 Bqm^{-3} respectively. The Target Level was to provide an objective for remedial action in existing homes and preventive action in new homes.

The term 'radon Affected Area' is defined as those parts of the country with >1% of homes estimated to be above the Action Levels. The level of protection needed is site-specific and can be determined by reference to this mapping on the Public Health England website, which indicates the highest radon potential within each 1km grid square. Each 1km grid square is classified on the basis of the percentage of existing homes within that grid square estimated to have radon concentrations above the Action Level. There are 6 'bands': <1%; 1 to 3%; 3 to 5%; 5 to 10%; 10 to 30%; and >30%.

The NRPB advised that action should be taken to reduce radon concentrations in existing homes if the radon concentration exceeded the Action Level of 200 Bqm^{-3} in room air averaged over a year; ten times the average UK domestic radon concentration. NRPB advice informed changes in the requirements for radon protection in new buildings.

- **Basic** preventive measures are required in new buildings, extensions, conversions and refurbishments if the probability of exceeding the Action Level is **>3%** in England and Wales, and >1% in Scotland and Northern Ireland.
- Provision for further preventive (**Full**) measures is required in new buildings if the probability of exceeding the Action Level is **>10%**.

At present Building Regulations Approved Document C advocates basic measures for the probability banding 3% to 10%, and full measures if >10%. However, HPA would like to see all new build include basic measures.

Action & Target Levels should also be applied to non-domestic buildings with public occupancy exceeding 2,000 hrs/yr and to all schools.

Hydrogeology

Reference is made to publicly available Government held digital data via QGIS, and Landmark or Groundsure with respect to:

- Groundwater quality
- Recorded pollution incidents
- Licensed groundwater abstractions

From April 2010 the EA's Groundwater Protection Policy uses aquifer designations that are consistent with the Water Framework Directive. These designations reflect the importance of aquifers in terms of groundwater as a resource (drinking water supply), but also their role in supporting surface water flows and wetland ecosystems. The aquifer designation data is based on geological mapping provided by the British Geological Survey. The maps are split into two different types of aquifer designation:

- Superficial (Drift) - permeable unconsolidated (loose) deposits. For example, sands and gravels
- Bedrock - solid permeable formations e.g. sandstone, chalk and limestone

The maps display the following aquifer designations:

Principal aquifers: These are layers of rock or superficial deposits that have high intergranular and/or fracture permeability - meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale. In most cases, principal aquifers are aquifers previously designated as major aquifer.

Secondary aquifers: These include a wide range of rock layers or superficial deposits with an equally wide range of water permeability and storage. Secondary aquifers are subdivided into three types:

- **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
- **Secondary B** - predominantly lower permeability layers which may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers
- Secondary undifferentiated - In most cases, this is because the rock type in question has previously been designated as both a minor and non-aquifer in different locations due to the variable characteristics.

---

1 BRE Report BR211, 2023: "Radon: guidance on protective measures for new buildings (including supplementary advice for extensions, conversions and refurbishment projects".

2 Limitation of Human Exposure to Radon, Documents of the Health Protection Agency - Radiation, Chemical and Environmental Hazards, RCE-15. July 2010.

Unproductive strata: These are rock layers or superficial deposits with low permeability that have negligible significance for water supply or river base flow.

The EA maps only display the principal and secondary aquifers as coloured areas. All uncoloured areas on the map will be unproductive strata. However, for uncoloured areas on the superficial (drift) designation map it is not possible to distinguish between areas of unproductive strata and areas where no superficial deposits are present; to do this, it is necessary to consult the published geological survey maps.

For the purposes of the EA's Groundwater Protection Policy the following default position applies, unless there is site specific information to the contrary:

- If no superficial (drift) aquifers are shown, the bedrock designation is adopted
- In areas where the bedrock designation shows unproductive strata (the uncoloured areas) the superficial designation is adopted
- In all other areas, the more sensitive of the two designations is used (e.g. If secondary superficial overlies principal bedrock, an overall designation of principal is assumed)

The EA have also designated groundwater Source Protection Zones, which are based on proximity to a groundwater source (springs, wells and abstraction boreholes). The size of a Source Protection Zone is a function of the aquifer, volume of groundwater abstracted and the effective rainfall, and may vary from tens to several thousand hectares.

Hydrology

Reference is made to publicly available Government held digital data via QGIS, and Landmark or Groundsure with respect to:

- Surface water quality
- Recorded pollution incidents
- Licensed abstractions (groundwater & surface waters)
- Licensed discharge consents
- Site susceptibility to flooding

The EA have set **water quality** targets for all rivers. These targets are known as River Quality Objectives (RQOs). The water quality classification scheme used to set RQO planning targets is known as the River Ecosystem scheme. The scheme comprises five classes (RE1 to RE5) which reflect the chemical quality requirements of communities of plants and animals occurring in our rivers.

General Quality Assessment (GQA) grades reflect actual water quality. They are based on the most recent analytical testing undertaken by the EA. There are 6 GQA grades (denoted A to F) defined by the concentrations of biochemical oxygen demand, total ammonia and dissolved oxygen.

The susceptibility of a site to **flooding** is assessed by reference to a Flood Map on the Environment Agency's website. These maps show natural floodplains - areas potentially at risk of flooding if a river rises above its banks, or high tides and stormy seas cause flooding in coastal areas. There are two different kinds of area shown on the Flood Map:

1. Dark blue areas (Flood Zone 3) could be flooded by the sea by a flood that has a 0.5% (1 in 200) or greater chance of happening each year, or by a river by a flood that has a 1% (1 in 100) or greater chance of happening each year
2. Light blue areas (Flood Zone 2) show the additional extent of an extreme flood from rivers or the sea. These outlying areas are likely to be affected by a major flood, with up to a 0.1% (1 in 1000) chance of occurring each year

These two colours show the extent of the natural floodplain if there were no flood defences or certain other manmade structures and channel improvements. Where there is no blue shading (Flood Zone 1), there is less than a 0.1% (1 in 1000) chance of flooding occurring each year.

The maps also show all flood defences built in the last five years to protect against river floods with a 1% (1 in 100) chance of happening each year, or floods from the sea with a 0.5% (1 in 200) chance of happening each year, together with some, but not all, older defences and defences which protect against smaller floods.

The Agency's assessment of the likelihood of flooding from rivers and the sea at any location is based on the presence and effect of all flood defences, predicted flood levels, and ground levels.

It should also be noted that as the floodplain shown is the 1 in 100 year, areas outside this may be flooded by more extreme floods (e.g. the 1 in 1000 year flood). Also, parts of the areas shown at risk of flooding will be flooded by lesser floods (e.g. the 1 in 5 year flood). In some places due to the shape of the river valley, the smaller floods will flood a very similar extent to larger floods but to a lesser depth.

If a site falls within a floodplain, it is recommended that a flood survey be undertaken by a specialist who can advise on appropriate mitigating measures; i.e. raising slab levels, provision of storage etc. In accordance with Chapter 10 of the National Planning Policy Framework, a site-specific flood risk assessment is required for: proposals of 1 hectare or greater in Flood Zone 1, or in an area within Flood Zone 1 which has critical drainage problems (as notified to the local planning authority by the Environment Agency); and any new development in Flood Zones 2 and 3.

COMAH & explosive sites

Lithos obtain information from Landmark or Groundsure with respect to Control of Major Accident Hazards (COMAH) or explosive sites within 1km of the proposed development site. Lithos' report refers to any that are present, and recommends that the Client seeks further advice from the HSE.

Areas around COMAH sites (chemical plants etc) are zoned with respect to the implementation of emergency plans. The HSE are a statutory consultee to the local planning authority for all COMAH sites. The COMAH site may have to revise its emergency action plan if development occurs. This might be quite straightforward or could entail significant expenditure. Consequently, the COMAH site may object to a proposed development (although it is the Local Authority who have final say, and they are likely to place more weight on advice from the HSE).

Preliminary conceptual site model

The site's environmental setting (and proposed end use) is used by Lithos to assess the significance of any contamination encountered during the subsequent ground investigation.

Assessment of contaminated land is based on an evaluation of pollutant linkages (source-pathway-receptor). Contaminants within the near surface strata represent a potential source of pollution. The environment (most notably groundwater), site workers and end users are potential receptors.

Potential pollutant linkages are shown on a preliminary conceptual site model (pCSM). A CSM is essentially a cross-section through a site that reflects both the surface topography and underlying geology, and shows surface features of interest. The most significant sources of contamination are then superimposed onto this cross-section together with potential receptors (human health & controlled waters), and plausible pathways between the two. In addition to environmental issues, the CSM should also highlight geotechnical issues.

A pCSM is prepared after consideration of all available "desk study" data, and before design of the ground investigation. Data reviewed should include historical plans (with superimposition on a current-day plan), previous SI reports, geological maps etc. The pCSM, in conjunction with knowledge of site constraints (buildings, services, slopes etc) is used to design the ground investigation.

The revised CSM takes account of data obtained during the ground investigation, including the distribution of made ground, the nature and distribution of contamination etc.

Appendix B

Drawings



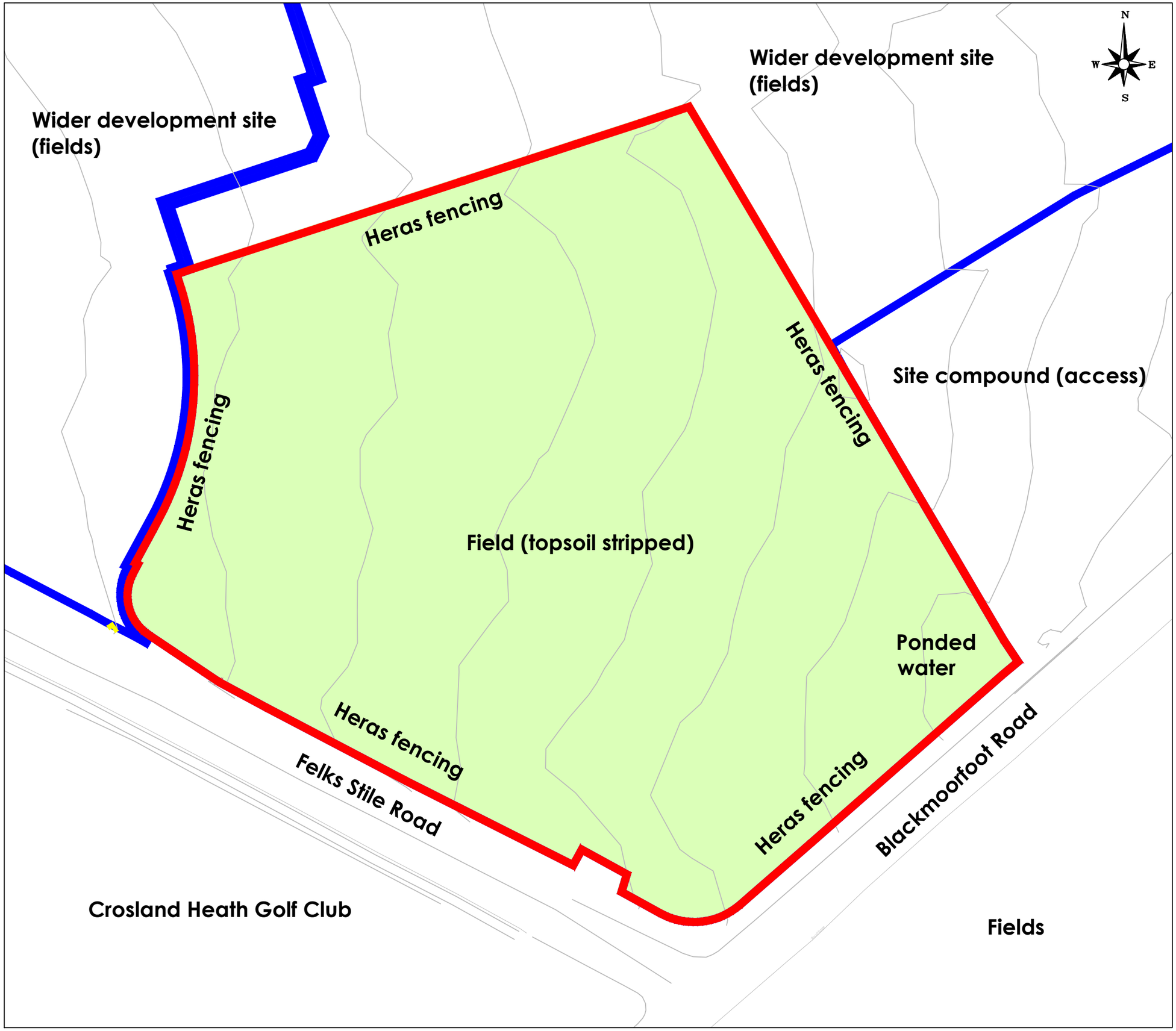
Reproduced from OS Explorer map 1:25,000 scale by permission of Ordnance Survey on behalf of The Controller of Her Majesty's Stationery Office. Crown copyright. All rights reserved. Licence number 100049696.

LITHOS CONSULTING

info@lithos.co.uk
www.lithos.co.uk

Tel 01937 545330

CLIENT	LNT CARE DEVELOPMENTS LTD
JOB TITLE	BLACK CATS, HUDDERSFIELD
DRAWING TITLE	SITE LOCATION PLAN
DRAWN	EW
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CHECKED	REG
DATE	17/11/2025
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SCALE	1:25,000
SHEET	A4
DRAWING NO.	5641/1
REVISION	



NOTES

SUBSOIL (STRIPPED FROM TOPSOIL)

APPROXIMATE SITE BOUNDARY

WIDER DEVELOPMENT SITE BOUNDARY

REV.	DESCRIPTION	DATE

LITHOS CONSULTING

info@lithos.co.uk
www.lithos.co.uk

Tel 01937 545330

CLIENT

LNT CARE DEVELOPMENTS LTD

JOB TITLE

BLACK CATS, HUDDERSFIELD

DRAWING TITLE

SITE FEATURES

DRAWN	DATE	STATUS
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CHECKED	DATE	FOR APPROVAL ☐
REG	14 11 2025	DRAFT ☐
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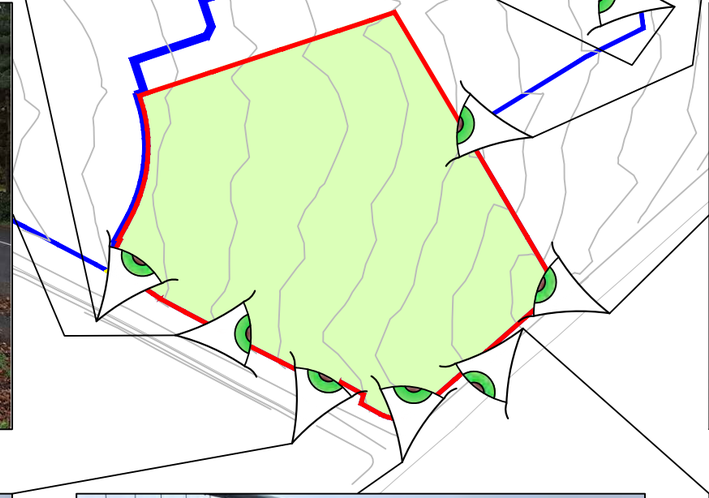
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N

W E

S

NOTES

SUBSOIL (STRIPPED FROM TOPSOIL)

APPROXIMATE SITE BOUNDARY

WIDER DEVELOPMENT SITE BOUNDARY

LOCATION & ORIENTATION OF PHOTOGRAPH

REV.	DESCRIPTION	DATE

LITHOS CONSULTING

info@lithos.co.uk
www.lithos.co.uk

Tel 01937 545330

CLIENT

LNT CARE DEVELOPMENTS LTD

JOB TITLE

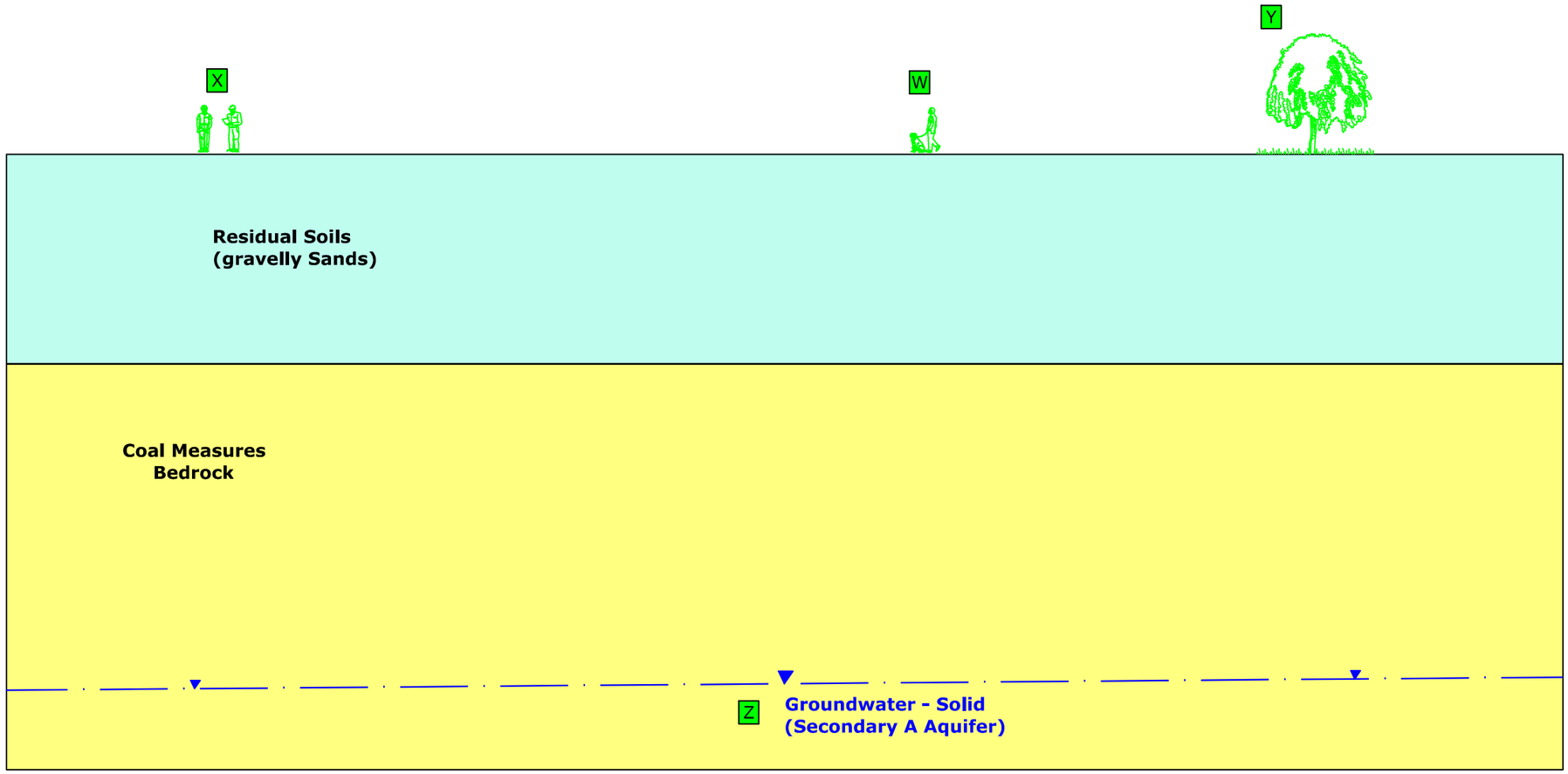
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SITE PHOTOGRAPHS

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CHECKED	DATE	FOR APPROVAL ☐
REG	14 11 2025	DRAFT ☐
		FINAL ☑

SCALE	SHEET	DRAWING NO.	REVISION
NOT TO SCALE	A3	5641/4	



SOURCES	PATHWAYS	RECEPTORS
		V END USERS (RESIDENTS) W SITE WORKERS X VEGETATION Z GROUNDWATER

NOTES

REV.	DESCRIPTION	DATE

LITHOS CONSULTING

info@lithos.co.uk
www.lithos.co.uk

Tel 01937 545330

CLIENT

LNT CARE DEVELOPMENTS LTD

JOB TITLE

BLACK CATS, HUDDERSFIELD

DRAWING TITLE

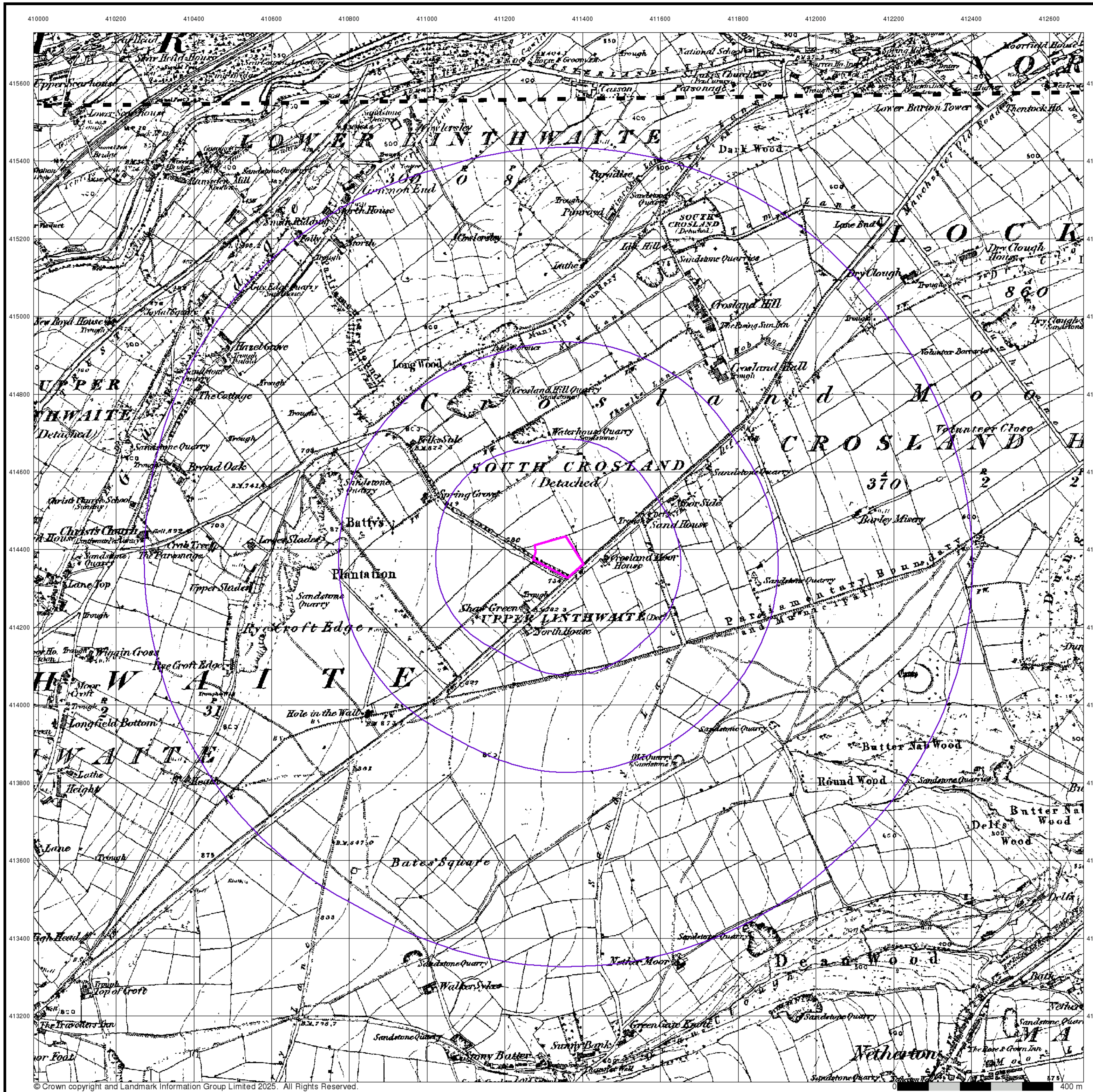
PRELIMINARY CONCEPTUAL SITE MODEL

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CHECKED	DATE	
REG	14 11 2025	

SCALE	SHEET	DRAWING NO.	REVISION
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Appendix D

Historical OS Plans



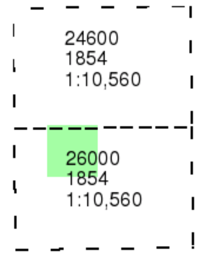
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Published 1854

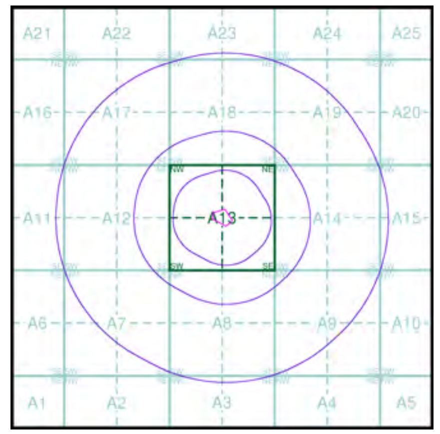
Source map scale - 1:10,560

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940`s, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)



Historical Map - Slice A



N

Order Details

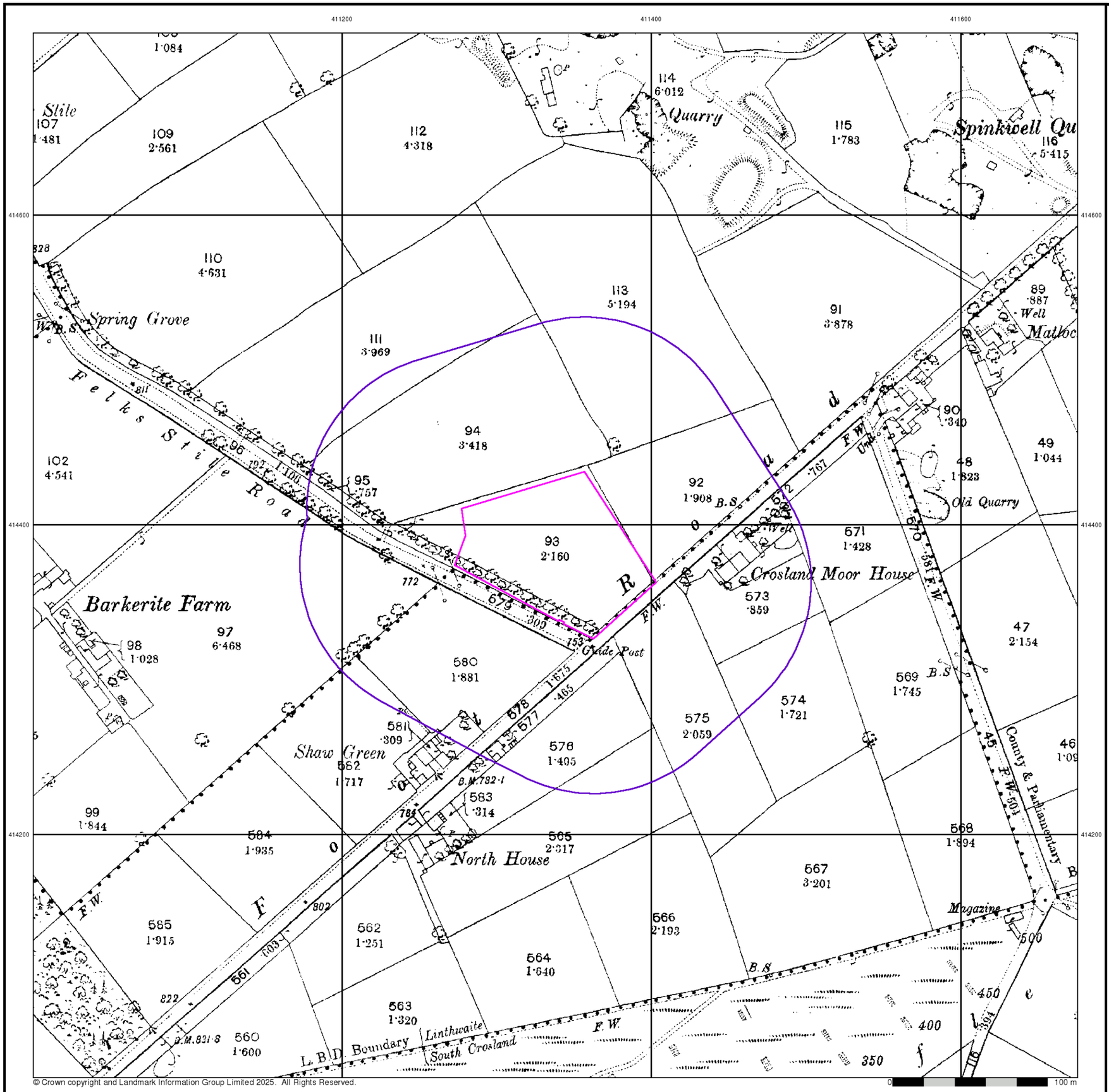
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National Grid Reference:	411340, 414380
Slice:	A
Site Area (Ha):	0.84
Search Buffer (m):	1000

Site Details

Black Cats, Huddersfield, HD4 7AD

Landmark INFORMATION GROUP

Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



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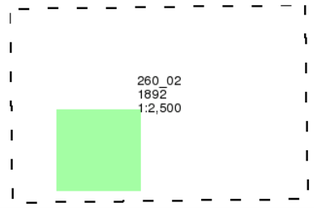
Yorkshire

Published 1892

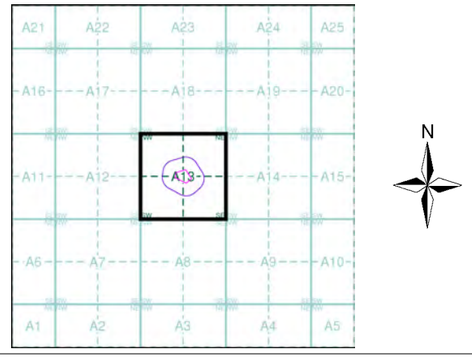
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)



Historical Map - Segment A13



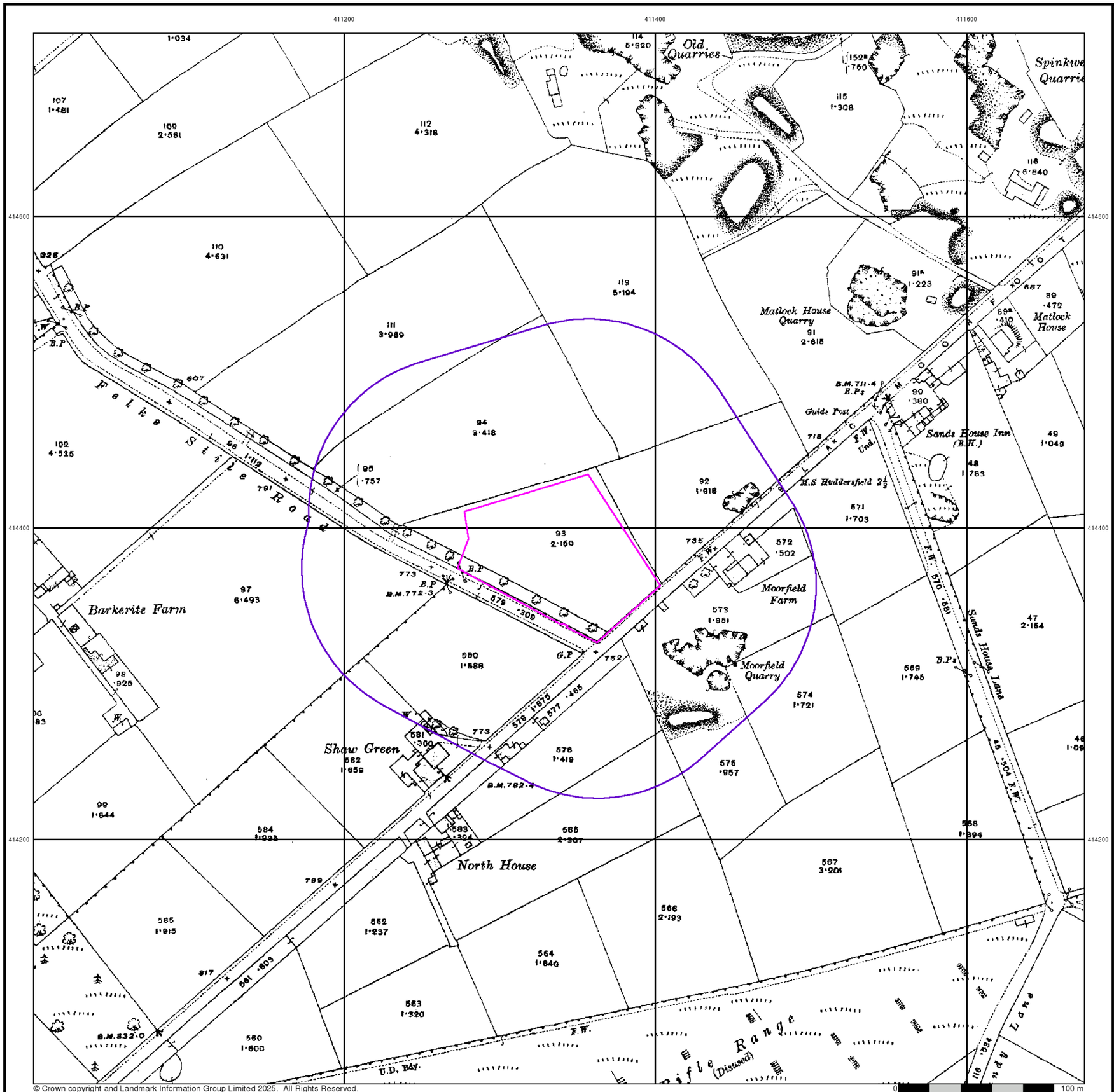
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Site Area (Ha):	0.84
Search Buffer (m):	100

Site Details

Black Cats, Huddersfield, HD4 7AD

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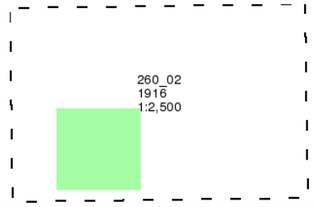
Yorkshire

Published 1916

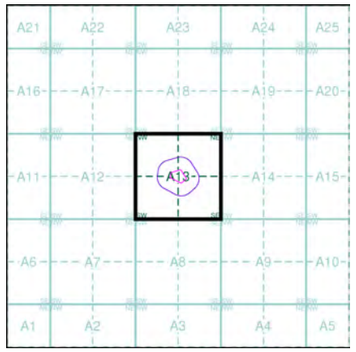
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)



Historical Map - Segment A13



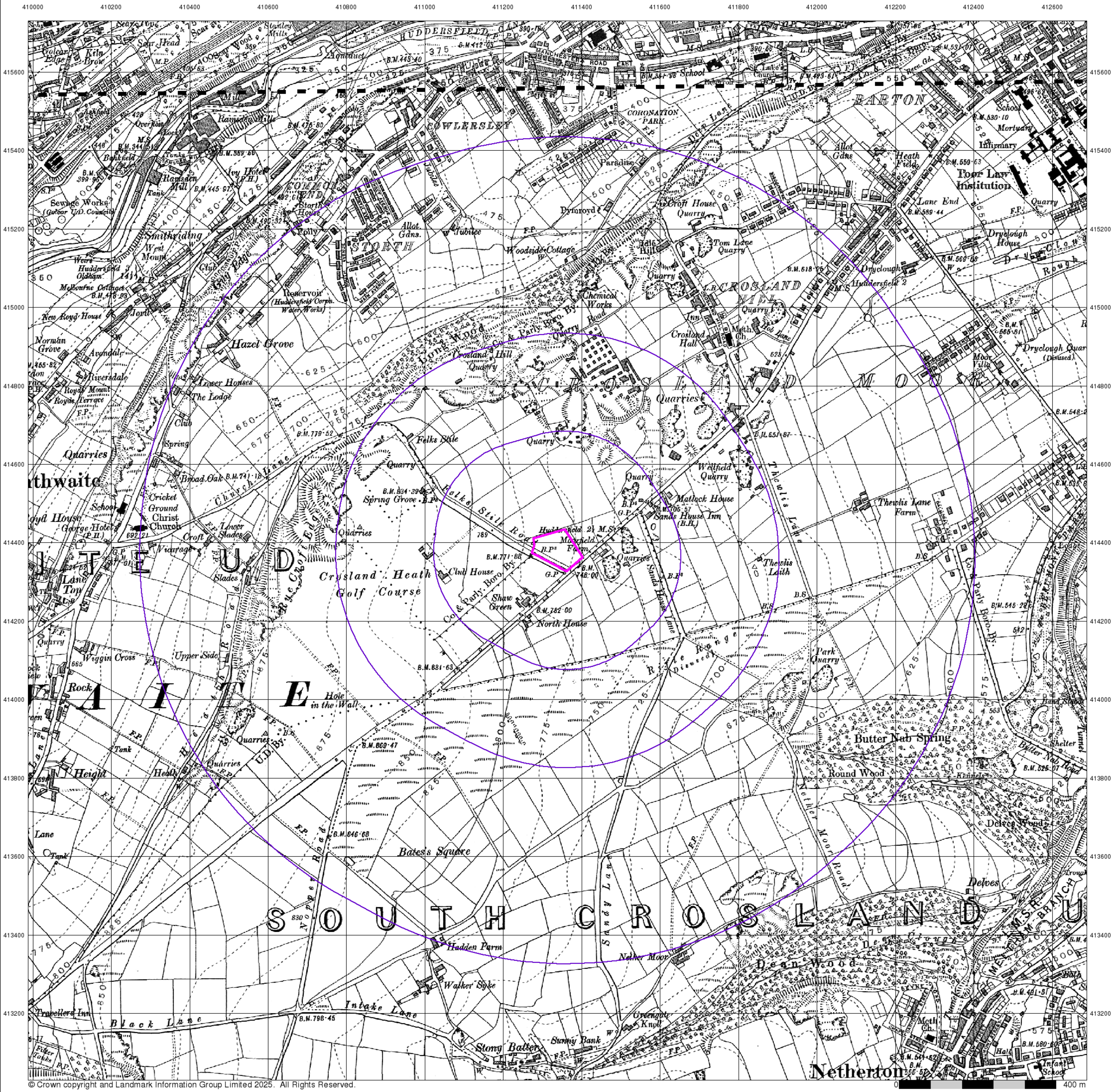
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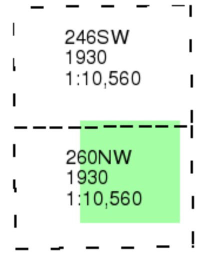
Yorkshire

Published 1930

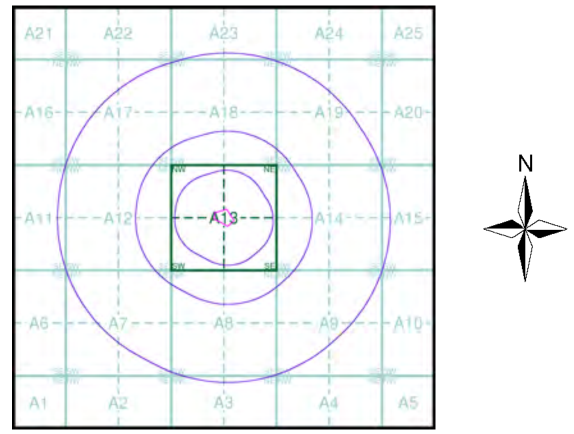
Source map scale - 1:10,560

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940`s, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

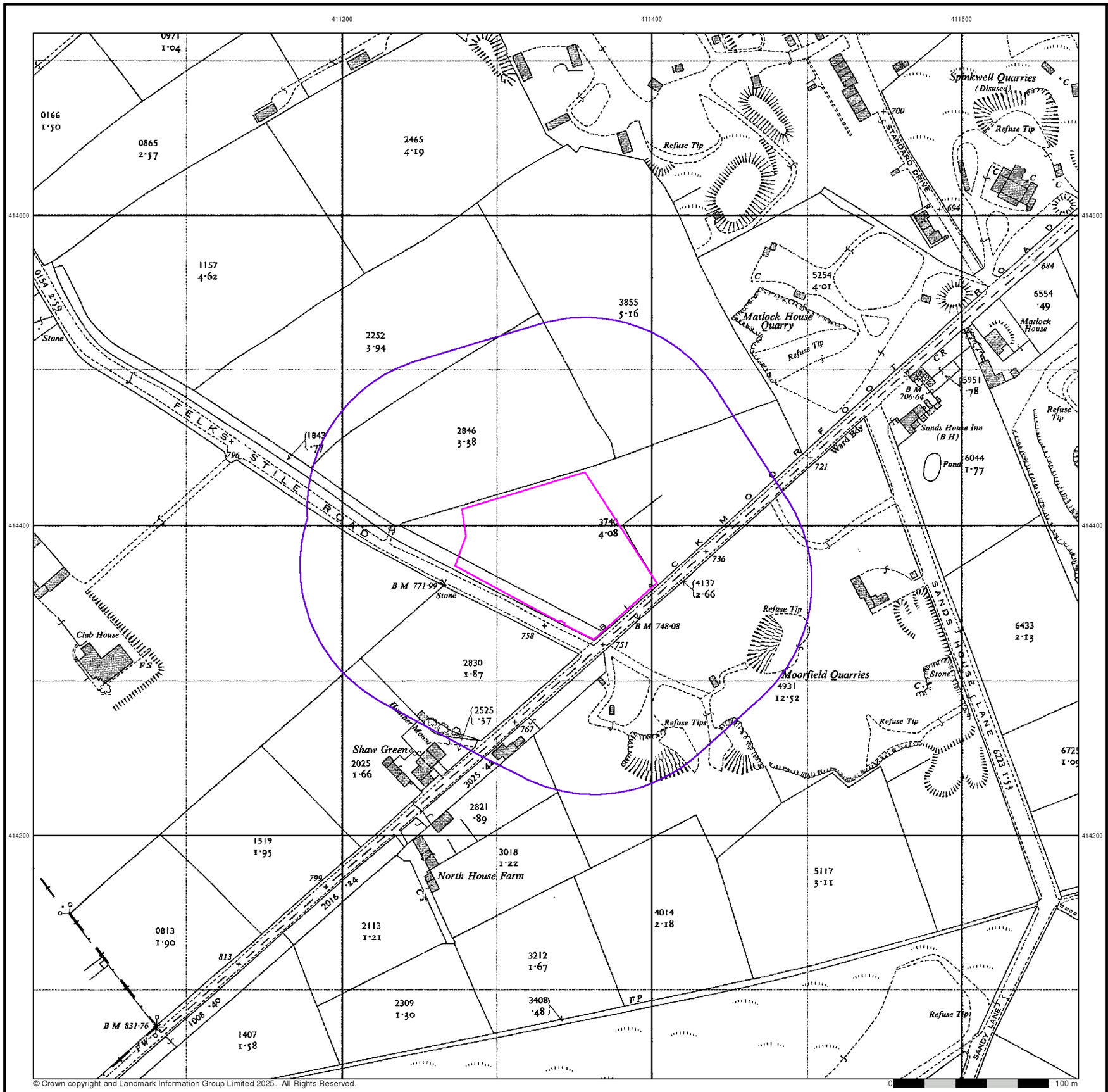
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National Grid Reference:	411340, 414380
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Search Buffer (m):	1000

Site Details

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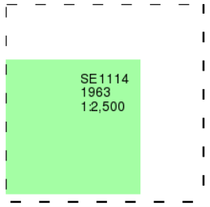
Ordnance Survey Plan

Published 1963

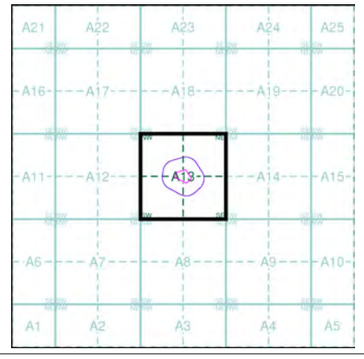
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Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

Order Number:	389902519_1_1
Customer Ref:	PO25379/5641/EW
National Grid Reference:	411340, 414380
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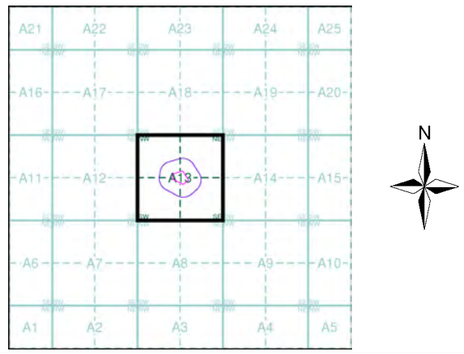
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Historical Aerial Photography

Published 2000

This aerial photography was produced by Getmapping, these vertical aerial photographs provide a seamless, full colour survey of the whole of Great Britain

Historical Aerial Photography - Segment A13

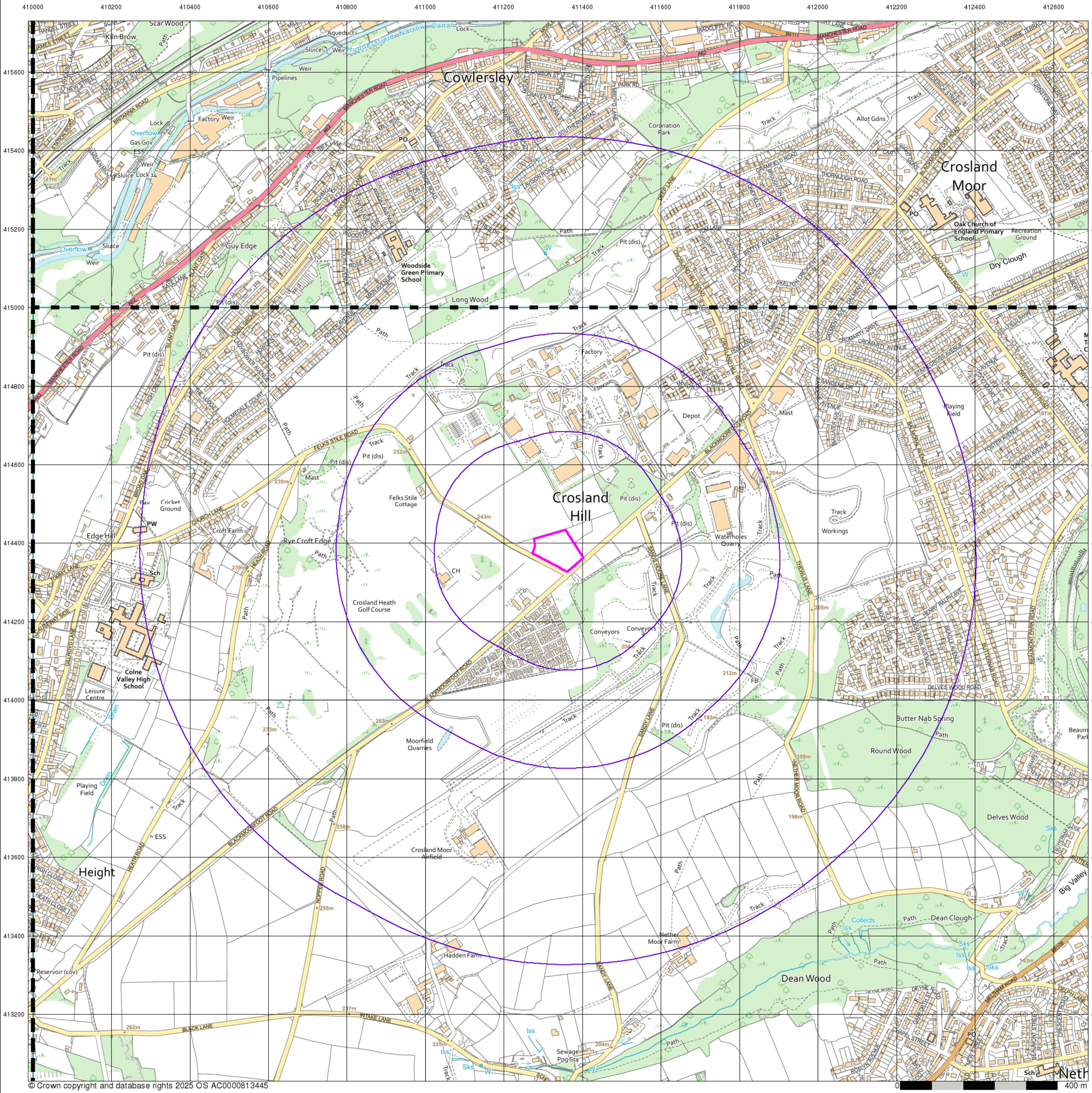


Order Details

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National Grid Reference:	411340, 414380
Slice:	A
Site Area (Ha):	0.84
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Site Details

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VectorMap Local

Published 2025

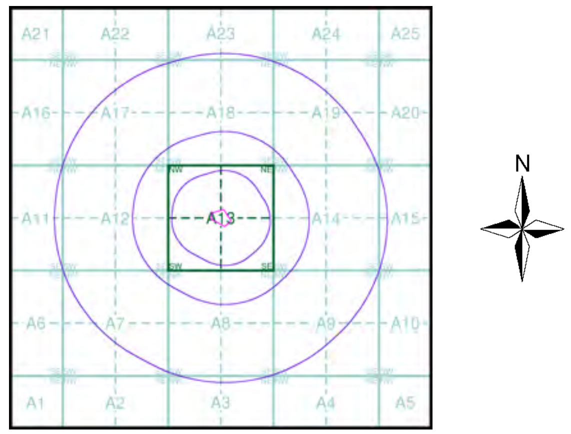
Source map scale - 1:10,000

VectorMap Local (Raster) is Ordnance Survey's highest detailed 'backdrop' mapping product. These maps are produced from OS's VectorMap Local, a simple vector dataset at a nominal scale of 1:10,000, covering the whole of Great Britain, that has been designed for creating graphical mapping. OS VectorMap Local is derived from large-scale information surveyed at 1:1250 scale (covering major towns and cities),1:2500 scale (smaller towns, villages and developed rural areas), and 1:10 000 scale (mountain, moorland and river estuary areas).

Map Name(s) and Date(s)

SE01NE 2025 Variable	SE11NW 2025 Variable
SE01SE 2025 Variable	SE11SW 2025 Variable

Historical Map - Slice A



Order Details

Order Number:	389902519_1_1
Customer Ref:	PO25379/5641/EW
National Grid Reference:	411340, 414380
Slice:	A
Site Area (Ha):	0.84
Search Buffer (m):	1000

Site Details

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Appendix E

Search Responses & other Correspondence

Envirocheck® Report:

Datasheet

Order Details:

Order Number:
389902519_1_1

Customer Reference:
PO25379/5641/EW

National Grid Reference:
411340, 414380

Slice:
A

Site Area (Ha):
0.84

Search Buffer (m):
1000

Site Details:

Black Cats, Huddersfield
HD4 7AD

Client Details:

Mr M Perrin
Lithos Consulting Ltd
Parkhill
Walton Road
Wetherby
LS22 5DZ

Contents

Report Section	Page Number
Summary	-
Agency & Hydrological	1
Waste	21
Hazardous Substances	29
Geological	30
Industrial Land Use	46
Sensitive Land Use	52
Data Currency	53
Data Suppliers	58
Useful Contacts	59

Introduction

The Environment Act 1995 has made site sensitivity a key issue, as the legislation pays as much attention to the pathways by which contamination could spread, and to the vulnerable targets of contamination, as it does the potential sources of contamination.
For this reason, Landmark's Site Sensitivity maps and Datasheet(s) place great emphasis on statutory data provided by the Environment Agency/Natural Resources Wales and the Scottish Environment Protection Agency; it also incorporates data from Natural England (and the Scottish and Welsh equivalents) and Local Authorities; and highlights hydrogeological features required by environmental and geotechnical consultants. It does not include any information concerning past uses of land. The datasheet is produced by querying the Landmark database to a distance defined by the client from a site boundary provided by the client.
In this datasheet the National Grid References (NGRs) are rounded to the nearest 10m in accordance with Landmark's agreements with a number of Data Suppliers.

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Radon Potential dataset Copyright Notice

Information supplied from a joint dataset compiled by The British Geological Survey and Public Health England. The probability result is only valid for properties above ground. All basement and cellar areas are considered to be at additional risk from high radon levels. If an underground room such as a cellar or basement makes up part of the living or working accommodation, the property should be tested regardless of Radon Affected Area status.

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Report Version v53.0

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Summary

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Agency & Hydrological					
BGS Groundwater Flooding Susceptibility	pg 1	Yes		Yes	n/a
Contaminated Land Register Entries and Notices					
Discharge Consents					
Prosecutions					
Enforcement and Prohibition Notices					
Integrated Pollution Controls					
Integrated Pollution Prevention And Control	pg 1			4	1
Local Authority Integrated Pollution Prevention And Control					
Local Authority Pollution Prevention and Controls	pg 2			1	
Local Authority Pollution Prevention and Control Enforcements					
Nearest Surface Water Feature	pg 2			Yes	
Pollution Incidents to Controlled Waters	pg 2		1		
Historical Prosecutions					
Registered Radioactive Substances					
Substantiated Pollution Incident Register					
Water Abstractions	pg 3		4	1	1 (*60)
Water Industry Act Referrals					
Groundwater Vulnerability Map	pg 19	Yes	n/a	n/a	n/a
Groundwater Vulnerability - Soluble Rock Risk			n/a	n/a	n/a
Groundwater Vulnerability - Local Information			n/a	n/a	n/a
Bedrock Aquifer Designations	pg 19	Yes	n/a	n/a	n/a
Superficial Aquifer Designations			n/a	n/a	n/a
Source Protection Zones					
Extreme Flooding from Rivers or Sea without Defences				n/a	n/a
Flooding from Rivers or Sea without Defences				n/a	n/a
Areas Benefiting from Flood Defences				n/a	n/a
Flood Water Storage Areas				n/a	n/a
Flood Defences				n/a	n/a
OS Water Network Lines	pg 20				5
Water Framework Directive - Catchment	pg 20	Yes		Yes	
Water Framework Directive - Groundwater	pg 20	Yes			
Water Framework Directive - Surface Waters					

Summary

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Waste					
BGS Recorded Landfill Sites	pg 21		1		3
Historical Landfill Sites	pg 21		1		7
Integrated Pollution Control Registered Waste Sites					
Licensed Waste Management Facilities (Landfill Boundaries)	pg 23		2		1
Licensed Waste Management Facilities (Locations)	pg 23		1	1	1
Local Authority Landfill Coverage	pg 24	1	n/a	n/a	n/a
Local Authority Recorded Landfill Sites					
Potentially Infilled Land (Non-Water)	pg 24		7	10	11
Potentially Infilled Land (Water)	pg 26				2
Registered Landfill Sites	pg 26		1	3	4
Registered Waste Transfer Sites					
Registered Waste Treatment or Disposal Sites					
Hazardous Substances					
Control of Major Accident Hazards Sites (COMAH)	pg 29			1	
Explosive Sites	pg 29			1	
Notification of Installations Handling Hazardous Substances (NIHHS)					
Planning Hazardous Substance Consents					
Planning Hazardous Substance Enforcements					

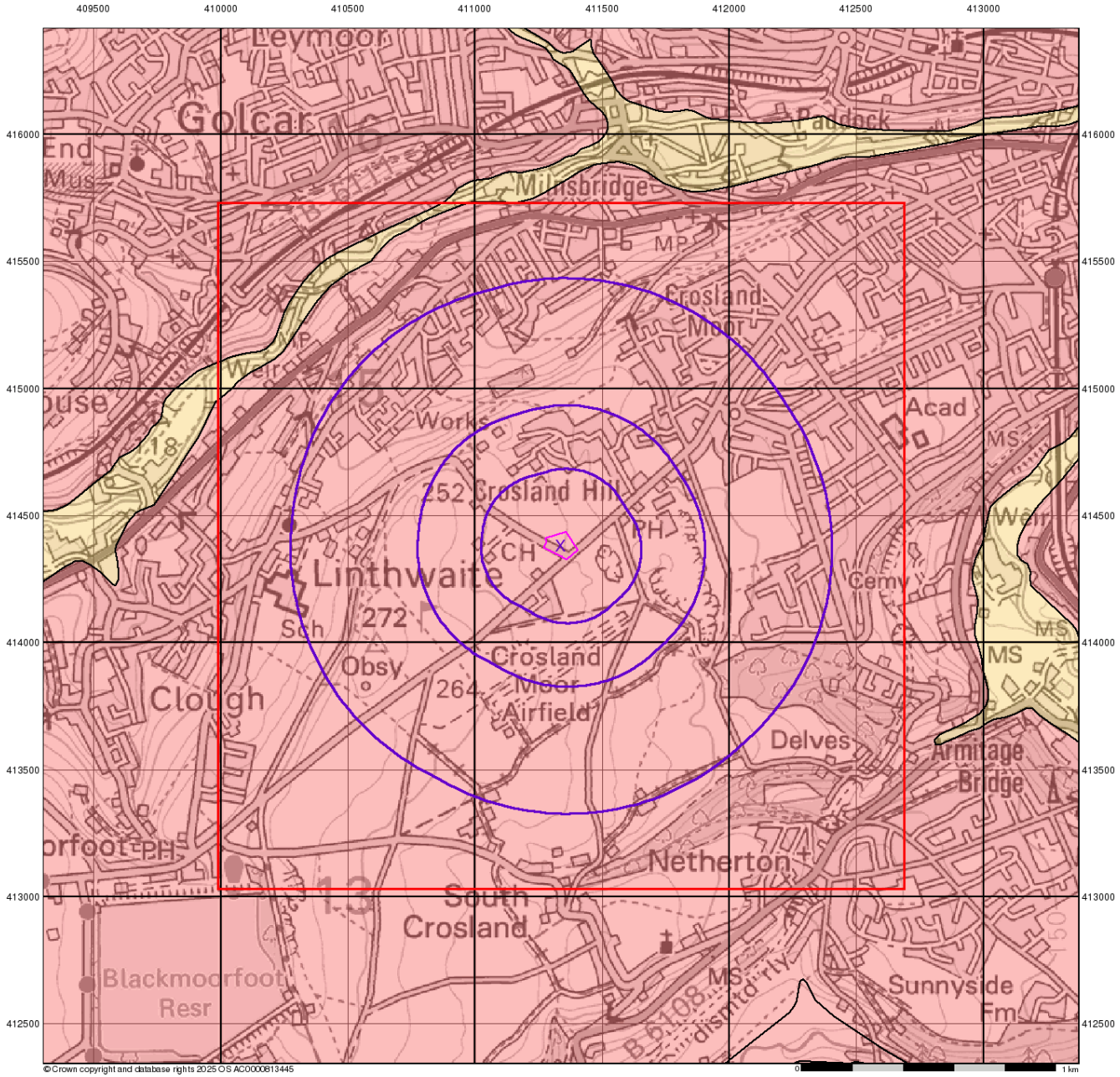
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Summary

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Geological					
BGS 1:625,000 Solid Geology	pg 30	Yes	n/a	n/a	n/a
BGS Estimated Soil Chemistry	pg 30	Yes			Yes
BGS Recorded Mineral Sites	pg 31		10	27	44
BGS Urban Soil Chemistry					
BGS Urban Soil Chemistry Averages					
CBSCB Compensation District			n/a	n/a	n/a
Coal Mining Affected Areas			n/a	n/a	n/a
Mining Instability			n/a	n/a	n/a
Man-Made Mining Cavities					
Natural Cavities					
Non Coal Mining Areas of Great Britain	pg 45	Yes		n/a	n/a
Potential for Collapsible Ground Stability Hazards	pg 45	Yes		n/a	n/a
Potential for Compressible Ground Stability Hazards	pg 45		Yes	n/a	n/a
Potential for Ground Dissolution Stability Hazards				n/a	n/a
Potential for Landslide Ground Stability Hazards	pg 45	Yes		n/a	n/a
Potential for Running Sand Ground Stability Hazards	pg 45		Yes	n/a	n/a
Potential for Shrinking or Swelling Clay Ground Stability Hazards				n/a	n/a
Radon Potential - Radon Affected Areas	pg 45	Yes	n/a	n/a	n/a
Radon Potential - Radon Protection Measures	pg 45	Yes	n/a	n/a	n/a
Industrial Land Use					
Contemporary Trade Directory Entries	pg 46			1	12
Fuel Station Entries	pg 47				1
Points of Interest - Commercial Services	pg 47			1	6
Points of Interest - Education and Health					
Points of Interest - Manufacturing and Production	pg 47		5	9	17
Points of Interest - Public Infrastructure	pg 50		1		4
Points of Interest - Recreational and Environmental	pg 50			1	5
Underground Electrical Cables					

Summary

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Sensitive Land Use					
Ancient Woodland	pg 52				1
Areas of Adopted Green Belt	pg 52	1			
Areas of Unadopted Green Belt	pg 52	1			
Areas of Outstanding Natural Beauty					
Environmentally Sensitive Areas					
Forest Parks					
Local Nature Reserves					
Marine Nature Reserves					
National Nature Reserves					
National Parks					
Nitrate Sensitive Areas					
Nitrate Vulnerable Zones					
Ramsar Sites					
Sites of Special Scientific Interest					
Special Areas of Conservation					
Special Protection Areas					
World Heritage Sites					



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Groundwater Vulnerability

General

Specified Site | Specified Buffer(s) | Bearing Reference Point | Slice | Map ID

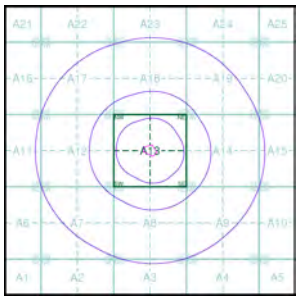
Agency and Hydrological

Bedrock Aquifers	Superficial Aquifers
High Vulnerability, Principal Aquifer	High Vulnerability, Principal Aquifer
High Vulnerability, Secondary Aquifer	High Vulnerability, Secondary Aquifer
Medium Vulnerability, Principal Aquifer	Medium Vulnerability, Principal Aquifer
Medium Vulnerability, Secondary Aquifer	Medium Vulnerability, Secondary Aquifer
Low Vulnerability, Principal Aquifer	Low Vulnerability, Principal Aquifer
Low Vulnerability, Secondary Aquifer	Low Vulnerability, Secondary Aquifer

Unproductive Aquifer

Soluble Rock

Site Sensitivity Context Map - Slice A



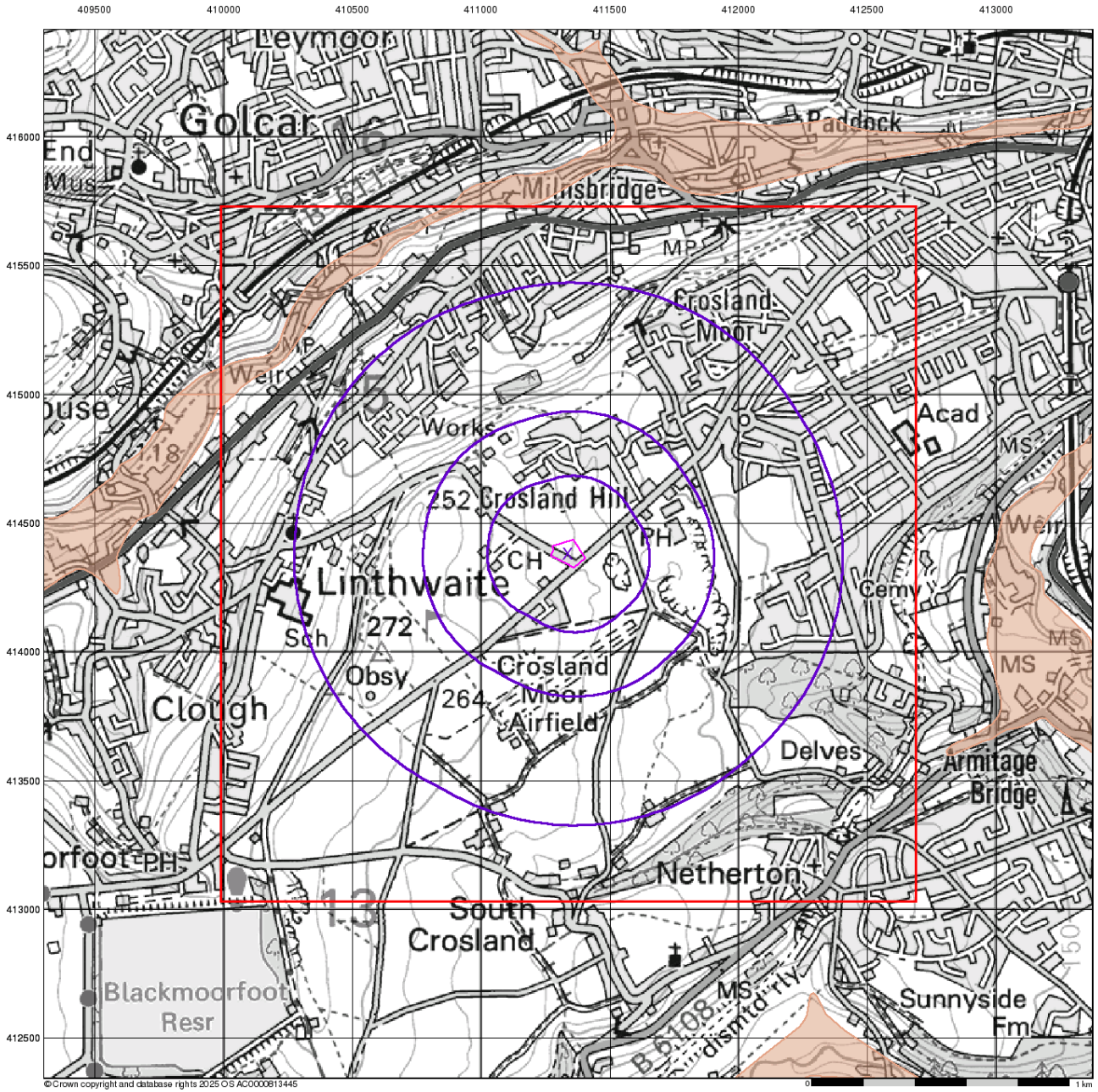
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Slice:	A
Site Area (Ha):	0.84
Search Buffer (m):	1000

Site Details

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Superficial Aquifer Designation

General

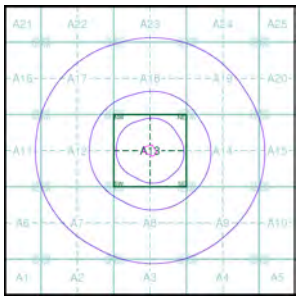
Specified Site | Specified Buffer(s) | Bearing Reference Point | Slice | Map ID

Agency and Hydrological

Geological Classes

- Principal Aquifer
- Secondary A Aquifer
- Secondary B Aquifer
- Secondary Undifferentiated
- Unproductive Strata
- Unknown
- Unknown (Lakes and Landslip)

Site Sensitivity Context Map - Slice A



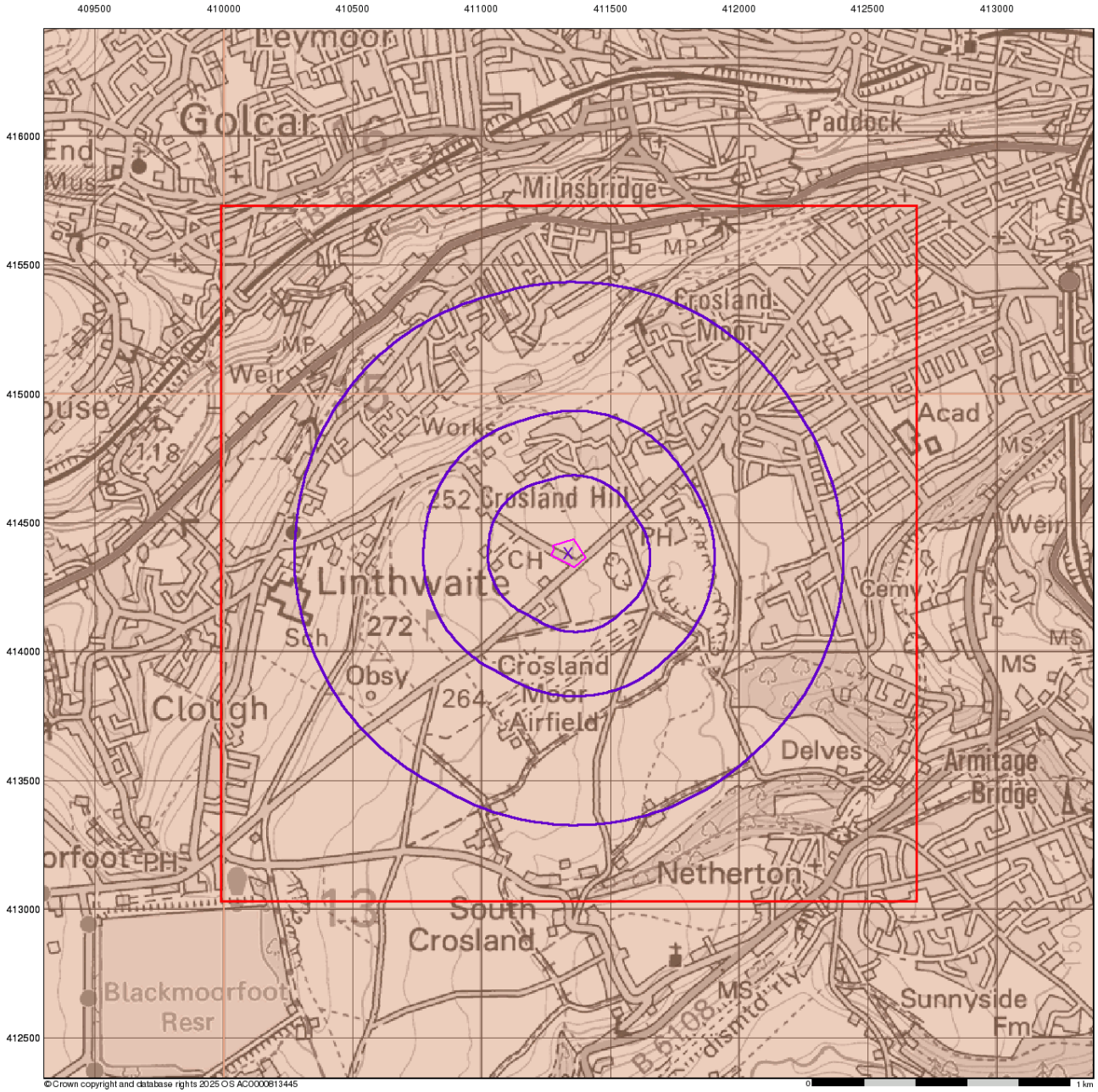
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Bedrock Aquifer Designation

General

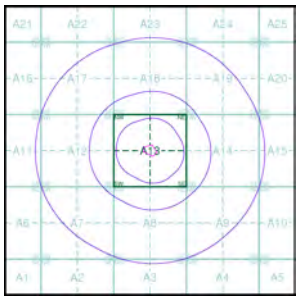
Specified Site | Specified Buffer(s) | Bearing Reference Point | Slice | Map ID

Agency and Hydrological

Geological Classes

- Principal Aquifer
- Secondary A Aquifer
- Secondary B Aquifer
- Secondary Undifferentiated
- Unproductive Strata
- Unknown
- Unknown (Lakes and Landslip)

Site Sensitivity Context Map - Slice A



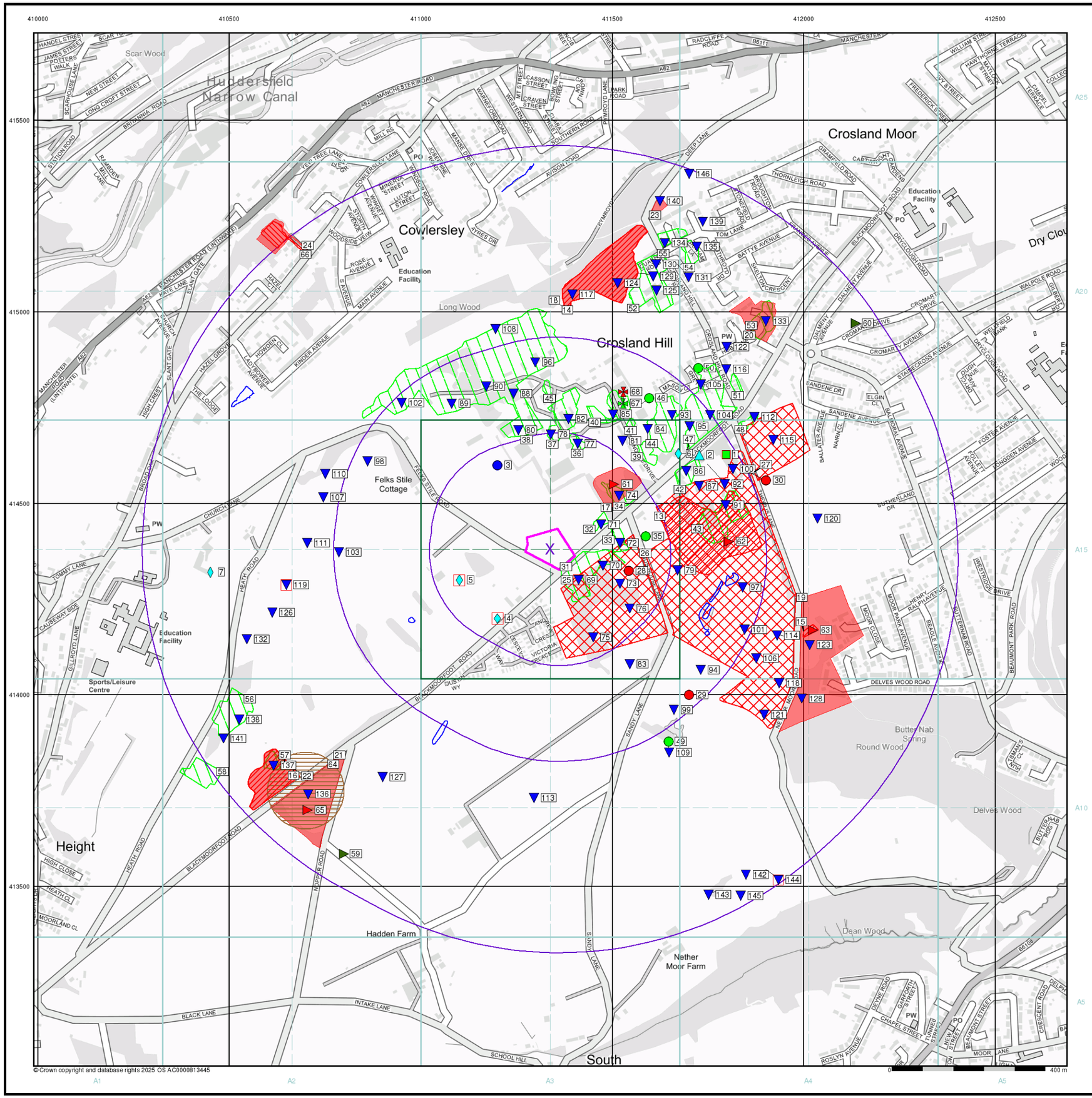
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General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Map ID
- Several of Type at Location

Agency and Hydrological

- Contaminated Land Register Entry or Notice (Location)
- Contaminated Land Register Entry or Notice
- Discharge Consent
- Enforcement or Prohibition Notice
- Integrated Pollution Control
- Integrated Pollution Prevention Control
- Local Authority Integrated Pollution Prevention and Control
- Local Authority Pollution Prevention and Control
- Local Authority Pollution Prevention and Control Enforcement
- Pollution Incident to Controlled Waters
- Historical Prosecutions
- Prosecutions
- Registered Radioactive Substance
- River Network or Water Feature
- Substantiated Pollution Incident Register
- Water Abstraction
- Water Industry Act Referral

Waste

- BGS Recorded Landfill Site (Location)
- BGS Recorded Landfill Site
- EA Historic Landfill (Buffered Point)
- EA Historic Landfill (Polygon)
- Integrated Pollution Control Registered Waste Site
- Licensed Waste Management Facility (Landfill Boundary)
- Licensed Waste Management Facility (Location)
- Local Authority Recorded Landfill Site (Location)
- Local Authority Recorded Landfill Site
- Potentially Infilled Land (Non-water)
- Potentially Infilled Land (Non-water)
- Potentially Infilled Land (Non-water)
- Potentially Infilled Land (Water)
- Potentially Infilled Land (Water)
- Potentially Infilled Land (Water)
- Registered Landfill Site
- Registered Landfill Site (Location)
- Registered Landfill Site (Point Buffered to 100m)
- Registered Landfill Site (Point Buffered to 250m)
- Registered Waste Transfer Site (Location)
- Registered Waste Transfer Site
- Registered Waste Treatment or Disposal Site (Location)
- Registered Waste Treatment or Disposal Site

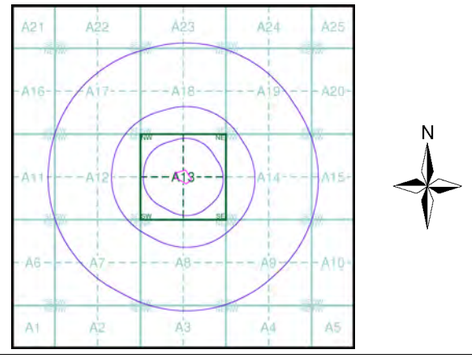
Hazardous Substances

- COMAH Site
- Explosive Site
- NIHHS Site
- Planning Hazardous Substance Consent
- Planning Hazardous Substance Enforcement

Geological

- BGS Recorded Mineral Site

Site Sensitivity Map - Slice A



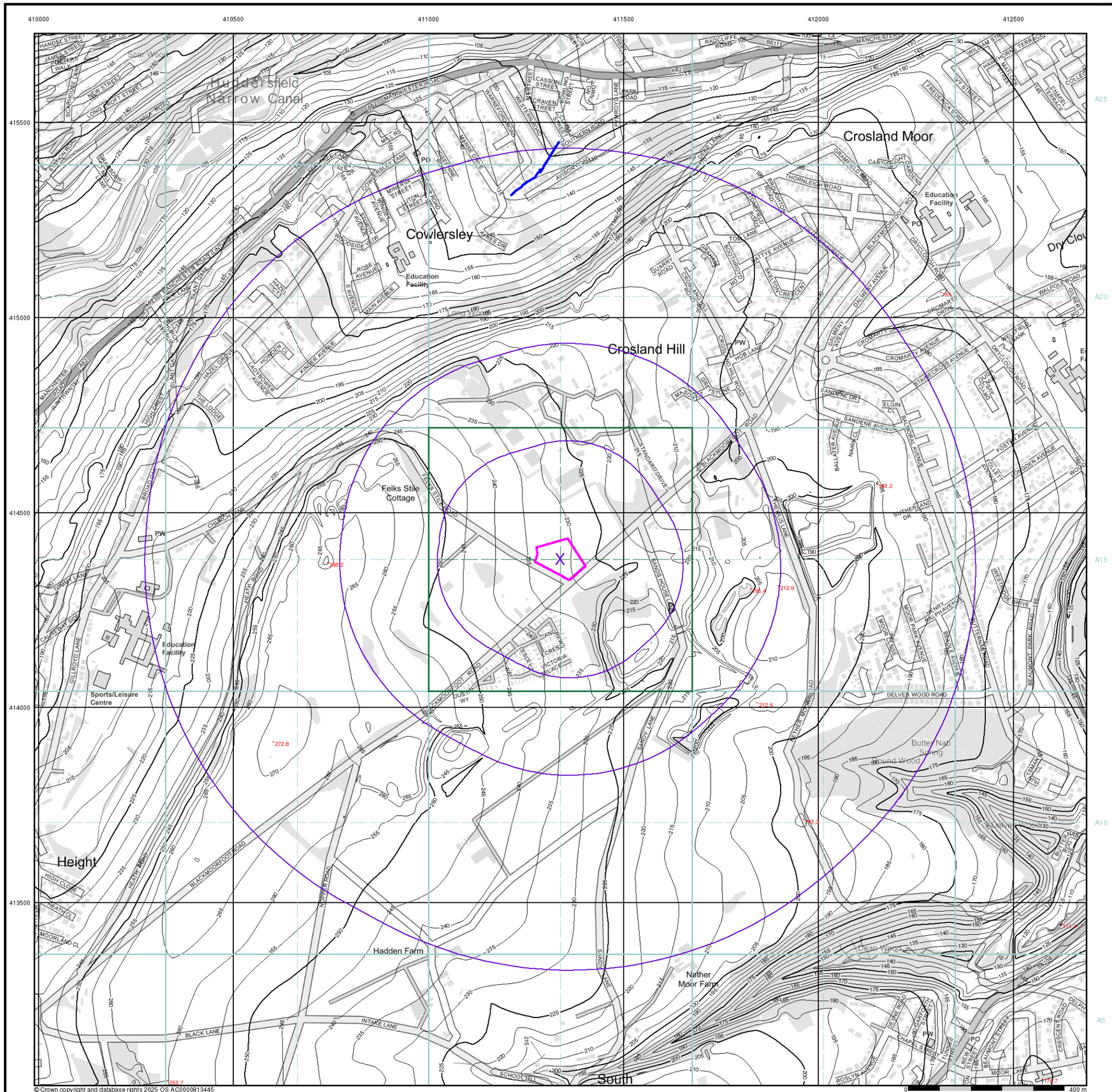
Order Details

Order Number:	389902519_1_1
Customer Ref:	PO25379/5641/EW
National Grid Reference:	411340, 414380
Slice:	A
Site Area (Ha):	0.84
Search Buffer (m):	1000

Site Details

Black Cats, Huddersfield, HD4 7AD

Landmark INFORMATION GROUP
Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



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LITHOS CONSULTING

General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point

OS Water Network Data

- Canal
- Reservoir
- Foreshore
- Marsh
- Tidal River
- Inland River
- Drain
- Other
- Lake
- Transfer
- Lock Or Flight Of Locks
- Sea

Contours (height in meters)

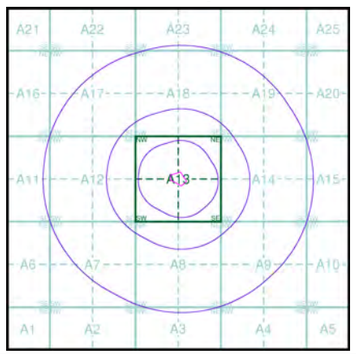
Standard Contour 105 100 95

Master Contour

Spot Height 167.3

- MLW Mean Low Water
- MHW Mean High Water

OS Water Network Map - Slice A



Order Details

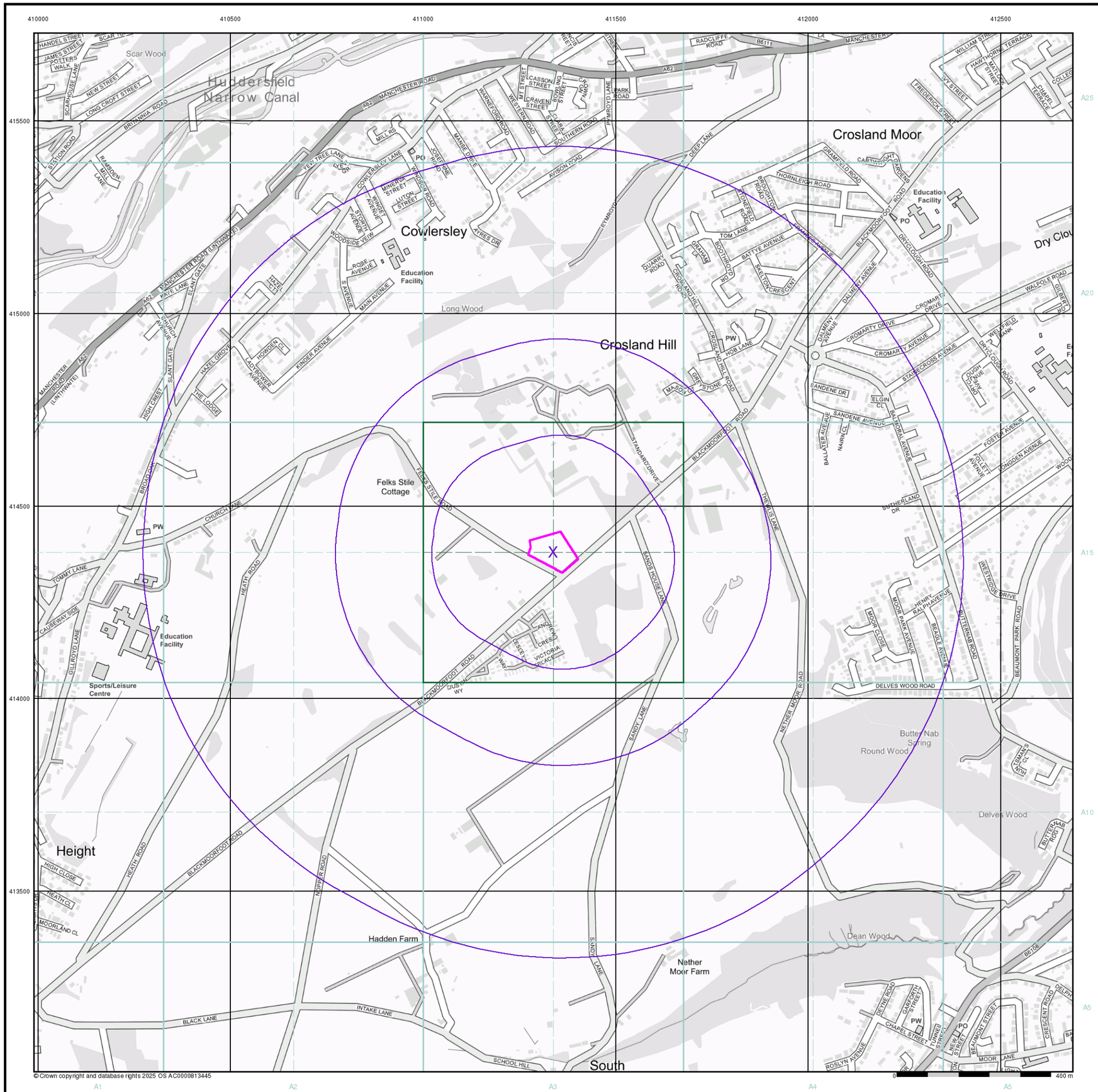
Order Number:	389902519_1_1
Customer Ref:	PO25379/5641/EW
National Grid Reference:	411340, 414380
Slice:	A
Site Area (Ha):	0.84
Search Buffer (m):	1000

Site Details

Black Cats, Huddersfield, HD4 7AD

Landmark INFORMATION GROUP

Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



LITHOS CONSULTING

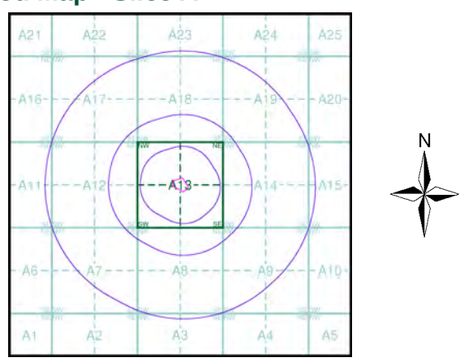
General

- Specified Site
- Specified Buffer(s)
- X Bearing Reference Point

Agency and Hydrological (Flood)

- Extreme Flooding from Rivers or Sea without Defences (Zone 2)
- Flooding from Rivers or Sea without Defences (Zone 3)
- Area Benefiting from Flood Defence
- Flood Water Storage Areas
- Flood Defence

Flood Map - Slice A



Order Details

Order Number:	389902519_1_1
Customer Ref:	PO25379/5641/EW
National Grid Reference:	411340, 414380
Slice:	A
Site Area (Ha):	0.84
Search Buffer (m):	1000

Site Details

Black Cats, Huddersfield, HD4 7AD

Landmark INFORMATION GROUP

Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk

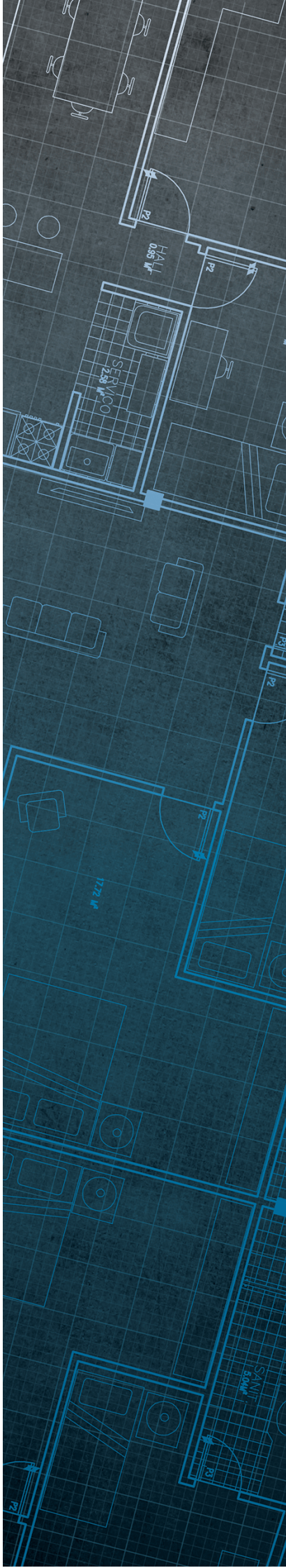
The Coal Authority

Consultants

Coal Mining Report

Black Cats
Huddersfield
Kirklees
HD4 7AD

Date of enquiry:	**11 November 2025**
Date enquiry received:	**11 November 2025**
Issue date:	**11 November 2025**
Our reference:	**51003537514001**
Your reference:	**PO25380/5641/EW**



Consultants
Coal Mining Report

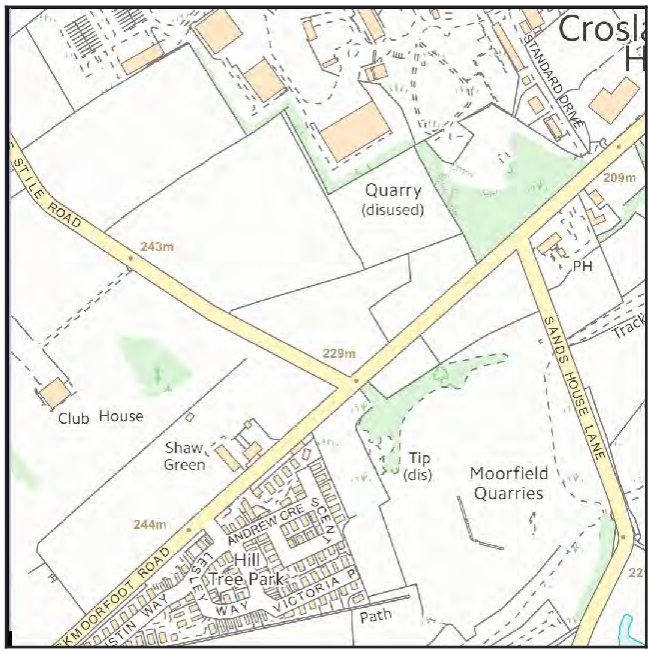
This report is based on and limited to the records held by the Coal Authority at the time the report was produced.

Client name

LITHOS CONSULTING

Enquiry address

Black Cats
Huddersfield
Kirklees
HD4 7AD



Approximate position of property

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How to contact us

0345 762 6848 (UK)
+44 (0)1623 637 000 (International)

200 Lichfield Lane
Mansfield
Nottinghamshire
NG18 4RG

reports@miningremediation.gov.uk

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Section 1 – Mining activity and geology

Past underground mining
No past mining recorded.

Probable unrecorded shallow workings
None.

Spine roadways at shallow depth
No spine roadway recorded at shallow depth.

Mine entries
None recorded within 100 metres of the enquiry boundary.

Abandoned mine plan catalogue numbers
None available.

Outcrops
No outcrops recorded.

Geological faults, fissures and breaklines
No faults, fissures or breaklines recorded.

Opencast mines
None recorded within 500 metres of the enquiry boundary.

Coal Authority managed tips
None recorded within 500 metres of the enquiry boundary.

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Section 2 – Investigative or remedial activity

Please refer to the 'Summary of findings' map (on separate sheet) for details of any activity within the area of the site boundary.

Site investigations
None recorded within 50 metres of the enquiry boundary.

Remediated sites
None recorded within 50 metres of the enquiry boundary.

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.

Mine gas
None recorded within 500 metres of the enquiry boundary.

Mine water treatment schemes
None recorded within 500 metres of the enquiry boundary.

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Section 3 – Licensing and future mining activity

Future underground mining
None recorded.

Coal mining licensing
None recorded within 200 metres of the enquiry boundary.

Court orders
None recorded.

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

Withdrawal of support notices
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.

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.

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Section 4 – Further information

Based on the responses in this report, no further information has been highlighted.

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.

MINE GAS: Please note, if there are no recorded instances of mine gas within 500m of the enquiry boundary, this does not mean that mine gas is not present within the vicinity. The Coal Authority Mine Gas data is limited to only those sites where a Mine Gas incident has been recorded. 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. In these instances, the Coal Authority recommends that a more detailed Gas Risk Assessment is undertaken by a competent assessor.

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Section 5 – Data definitions

The datasets used in this report have limitations and assumptions within their results. For more guidance on the data and the results specific to the enquiry boundary, please **email us at reports@miningremediation.gov.uk.**

Past underground coal mining

Details of all recorded underground mining relative to the enquiry boundary. Only past underground workings where the enquiry boundary is within 0.7 times the depth of the workings (zone of likely physical influence) allowing for seam inclination, will be included.

Probable unrecorded shallow workings

Areas where the Coal Authority believes there to be unrecorded coal workings that exist at or close to the surface (less than 30 metres deep).

Spine roadways at shallow depth

Connecting roadways either, working to working, or, surface to working, both in-seam and cross measures that exist at or close to the surface (less than 30 metres deep), either within or within 10 metres of the enquiry boundary.

Mine entries

Details of any shaft or adit either within, or within 100 metres of the enquiry boundary including approximate location, brief treatment details where known, the mineral worked from the mine entry and conveyance details where the mine entry has previously been sold by the Authority or its predecessors British Coal or the National Coal Board.

Abandoned mine plan catalogue numbers

Plan numbers extracted from the abandoned mines catalogue containing details of coal and other mineral abandonment plans deposited via the Mines Inspectorate in accordance with the Coal Mines Regulation Act and Metalliferous Mines Regulation Act 1872. A maximum of 9 plan extents that intersect with the enquiry boundary will be included. This does not infer that the workings and/or mine entries shown on the abandonment plan will be relevant to the site/property boundary.

Outcrops

Details of seam outcrops will be included where the enquiry boundary intersects with a conjectured or actual seam outcrop location (derived by either the British Geological Survey or the Coal Authority) or intersects with a defined 50 metres buffer on the coal (dip) side of the outcrop. An indication of whether the Coal Authority believes the seam to be of sufficient thickness and/or quality to have been worked will also be included.

Geological faults, fissures and breaklines

Geological disturbances or fractures in the bedrock. Surface fault lines (British Geological Survey derived data) and fissures and breaklines (Coal Authority derived data) intersecting with the enquiry boundary will be included. In some circumstances faults, fissures or breaklines have been known to contribute to surface subsidence damage as a consequence of underground coal mining.

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Opencast mines
Opencast coal sites from which coal has been removed in the past by opencast (surface) methods and where the enquiry boundary is within 500 metres of either the licence area, site boundary, excavation area (high wall) or coaling area.

Coal Authority managed tips
Locations of disused colliery tip sites owned and managed by the Coal Authority, located within 500 metres of the enquiry boundary.

Site investigations
Details of site investigations within 50 metres of the enquiry boundary where the Coal Authority has received information relating to coal mining risk investigation and/or remediation by third parties.

Remediated sites
Sites where the Coal Authority has undertaken remedial works either within or within 50 metres of the enquiry boundary following report of a hazard relating to coal mining under the Coal Authority's Emergency Surface Hazard Call Out procedures.

Coal mining subsidence
Details of alleged coal mining subsidence claims made since 31 October 1994 either within or within 50 metres of the enquiry boundary. Where the claim relates to the enquiry boundary confirmation of whether the claim was accepted, rejected or whether liability is still being determined will be given. Where the claim has been discharged, whether this was by repair, payment of compensation or a combination of both, the value of the claim, where known, will also be given.

Details of any current 'Stop Notice' deferring remedial works or repairs affecting the property/site, and if so the date of the notice.

Details of any request made to execute preventative works before coal is worked under section 33 of the Coal Mining Subsidence Act 1991. If yes, whether any person withheld consent or failed to comply with any request to execute preventative works.

Mine gas
Reports of alleged mine gas emissions received by the Coal Authority, either within or within 500 metres of the enquiry boundary that subsequently required investigation and action by the Coal Authority to mitigate the effects of the mine gas emission. Please note, if there are no recorded instances of mine gas reported, this does not mean that mine gas is not present within the vicinity. The Coal Authority Mine Gas data is limited to only those sites where a Mine Gas incident has been recorded.

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Mine water treatment schemes
Locations where the Coal Authority has constructed or operates assets that remove pollutants from mine water prior to the treated mine water being discharged into the receiving water body.

These schemes are part of the UK's strategy to meet the requirements of the Water Framework Directive. Schemes fall into 2 basic categories: Remedial – mitigating the impact of existing pollution or Preventative – preventing a future pollution incident.

Mine water treatment schemes generally consist of one or more primary settlement lagoons and one or more reed beds for secondary treatment. A small number are more specialised process treatment plants.

Future underground mining
Details of all planned underground mining relative to the enquiry boundary. Only those future workings where the enquiry boundary is within 0.7 times the depth of the workings (zone of likely physical influence) allowing for seam inclination will be included.

Coal mining licensing
Details of all licenses issued by the Coal Authority either within or within 200 metres of the enquiry boundary in relation to the under taking of surface coal mining, underground coal mining or underground coal gasification.

Court orders
Orders in respect of the working of coal under the Mines (Working Facilities and Support) Acts of 1923 and 1966 or any statutory modification or amendment thereof.

Section 46 notices
Notice of proposals relating to underground coal mining operations that have been given under section 46 of the Coal Mining Subsidence Act 1991.

Withdrawal of support notices
Published notices of entitlement to withdraw support and the date of the notice. Details of any revocation notice withdrawing the entitlement to withdraw support given under Section 41 of the Coal Industry Act 1994.

Payment to owners of former copyhold land
Relevant notices which may affect the property and any subsequent notice of retained interests in coal and coal mines, acceptance or rejection notices and whether any compensation has been paid to a claimant.

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The Coal Authority

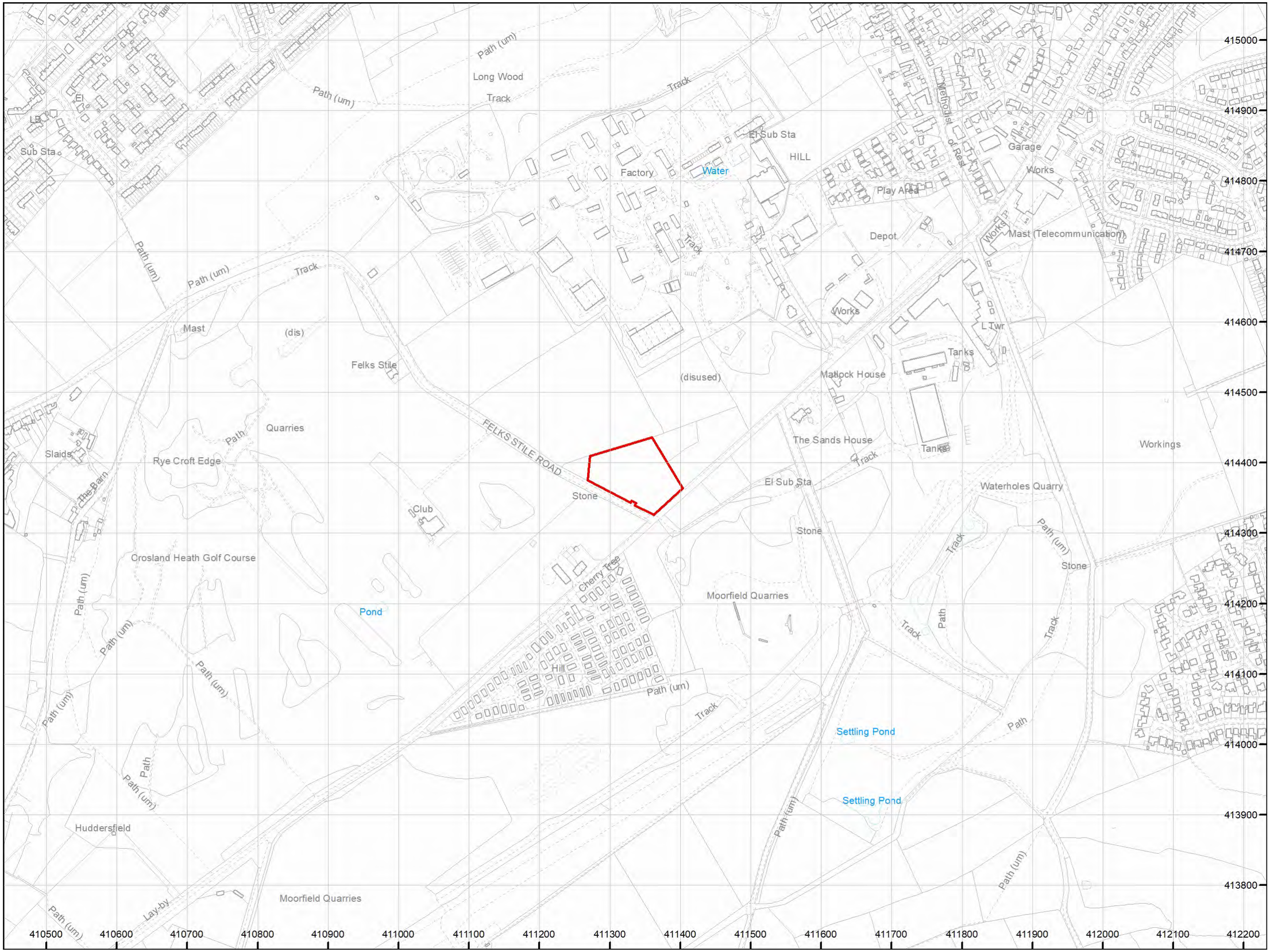
Summary of findings

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The map highlights any specific surface or subsurface features within or near to the boundary of the site.

Key

Approximate position of the enquiry boundary shown



How to contact us

0345 762 6848 (UK)
+44 (0)1623 637 000 (International)
reports@miningremediation.gov.uk

Appendix F
Trial Pit Logs
&
Soakaway Test Results

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP519
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411334.34 - 414406.69 Level: 231.80	Date 01/11/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.70	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	J&T					Dark brown clayey silty fine to coarse SAND with rare sandstone gravel. Frequent rootlets. (TOPSOIL)
				0.30	231.50		Light brown very clayey fine to medium SAND. (GRANULAR RESIDUAL SOIL)
				0.50	231.30		Light greyish brown fine to medium SAND. (GRANULAR RESIDUAL SOIL)
	0.70	T					
				0.80	231.00		Light orangish brown very sandy angular to subangular fine to coarse GRAVEL of sandstone with a high sandstone cobble content. (GRANULAR RESIDUAL SOIL)
				1.50	230.30		Medium strong yellowish brown fine to medium SANDSTONE. Recovered as gravel and cobbles. (ROUGH ROCK SANDSTONE)
				1.70	230.10		*At 1.7m, soakaway undertaken.* *At 1.7m, refusal on bedrock.* End of pit at 1.70 m

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Co-ordinates from hand held GPS, hole not surveyed in.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP537
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411310.53 - 414361.63 Level: 232.40	Date 02/11/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.60	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	J&T		0.20	232.20		Dark brown silty clayey fine to coarse SAND with rare sandstone gravel. (TOPSOIL)
				0.60	231.80		Light brown very gravelly silty fine to coarse SAND with a low cobble content. (GRANULAR RESIDUAL SOIL)
				1.10	231.30		Light brown very sandy subangular fine to coarse GRAVEL of sandstone. (GRANULAR RESIDUAL SOIL)
				1.60	230.80		Medium strong light yellowish brown fine to medium SANDSTONE. Recovered as sandy gravel and cobbles. (ROUGH ROCK SANDSTONE)
							At 1.6m, refusal on bedrock.
							End of pit at 1.60 m

1
2
3
4
5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Co-ordinates from hand held GPS, hole not surveyed in.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP538
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411367.38 - 414345.95 Level: 228.45	Date 02/11/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 2.00	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	B					MADE GROUND: Dark brown clayey silty fine to coarse SAND. Frequent rootlets. (MADE GROUND TOPSOIL)
				0.30	228.15		MADE GROUND: Dark greyish brown very silty fine to medium SAND. (GRANULAR MADE GROUND)
▼	0.70	J&T					*At 0.8m, groundwater seepage.*
				1.30	227.15		Medium strong light yellowish brown fine to medium SANDSTONE. Recovered as gravel, cobbles and boulders. (ROUGH ROCK SANDSTONE)
							At 1.3m, groundwater inflow.
	1.80	T					
				2.00	226.45		*At 2.0m, refusal on bedrock.* End of pit at 2.00 m

1
2
3
4
5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Co-ordinates from hand held GPS, hole not surveyed in.

Stability: 1. The sides of the trial pit were unstable between 0.8m and 1.3m depth during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP539
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411372.34 - 414398.68 Level: 229.30	Date 02/11/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.60	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.10	J&T		0.30	229.00		Dark brown clayey silty fine to coarse SAND. (TOPSOIL)
▼				1.10	228.20		Light brown silty very sandy angular to subangular fine to coarse GRAVEL with a medium cobble content. (GRANULAR RESIDUAL SOIL) *At 0.8m groundwater seepage.*
				1.60	227.70		Weak light yellowish brown fine to medium SANDSTONE. Recovered as gravel and cobbles. (ROUGH ROCK SANDSTONE) *At 1.6m, refusal on bedrock.* End of pit at 1.60 m

1
2
3
4
5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Co-ordinates from hand held GPS, hole not surveyed in.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP547
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411387.41 - 414370.87 Level: 227.55	Date 03/11/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.40	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.30	227.25		MADE GROUND: Dark brown clayey silty fine to coarse SAND. (MADE GROUND TOPSOIL)
	0.50	J&T		0.70	226.85		MADE GROUND: Light brown sandstone COBBLES and BOULDERS with some sandy gravel. (GRANULAR MADE GROUND)
				1.20	226.35		Light brown silty very gravelly fine to coarse SAND. Gravel is subangular to subrounded sandstone. (GRANULAR RESIDUAL SOIL)
				1.40	226.15		Light yellowish brown fine to medium SANDSTONE. Recovered as gravel and cobbles. (ROUGH ROCK SANDSTONE) End of pit at 1.40 m

1
2
3
4
5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Co-ordinates from hand held GPS, hole not surveyed in.

Stability: 1. The sides of the trial pit were unstable between ground level and 0.7m depth during excavation.

AGS

LITHOS CONSULTING

Trial Pit Log

Trialpit No
TP548
Sheet 1 of 1

Project Name: Black Cats	Project No. 4486	Co-ords: 411353.25 - 414374.29 Level: 230.25	Date 03/11/2023
Location: Blackmoorfoot Road, Huddersfield		Dimensions (m): Depth 1.30	Scale 1:25
Client: Vistry Homes, Countryside Partnerships, Miller Homes & Empire Knight Group			Logged JBR

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							Orangish brown silty clayey fine to coarse SAND. (TOPSOIL)
				0.40	229.85		Orange brown very sandy subangular fine to coarse GRAVEL of sandstone with a high cobble content. (GRANULAR RESIDUAL SOIL)
				1.00	229.25		Medium strong light yellowish brown fine to medium SANDSTONE. Recovered as gravel and cobbles. (ROUGH ROCK SANDSTONE)
				1.30	228.95		*At 1.3m, refusal on bedrock.* End of pit at 1.30 m

1
2
3
4
5

Remarks: 1. Prior to excavation a Cable Avoidance Tool (CAT) survey was carried out. 2. Groundwater was not apparent during excavation. 3. Backfilled with materials arising upon completion. 4. Co-ordinates from hand held GPS, hole not surveyed in.

Stability: 1. The sides of the trial pit remained stable during excavation.

AGS

SOIL INFILTRATION RATE IN ACCORDANCE WITH BRE DIGEST 365: 1991

Client:	Vistry Homes, Countryside Partnerships & Miller Homes
Engineer	CD & EW
Job Name:	Black Cats
Job No.:	4486

Date:	**01/11/2023**
Trial Pit No.	**TP519**
Test No.	**1**

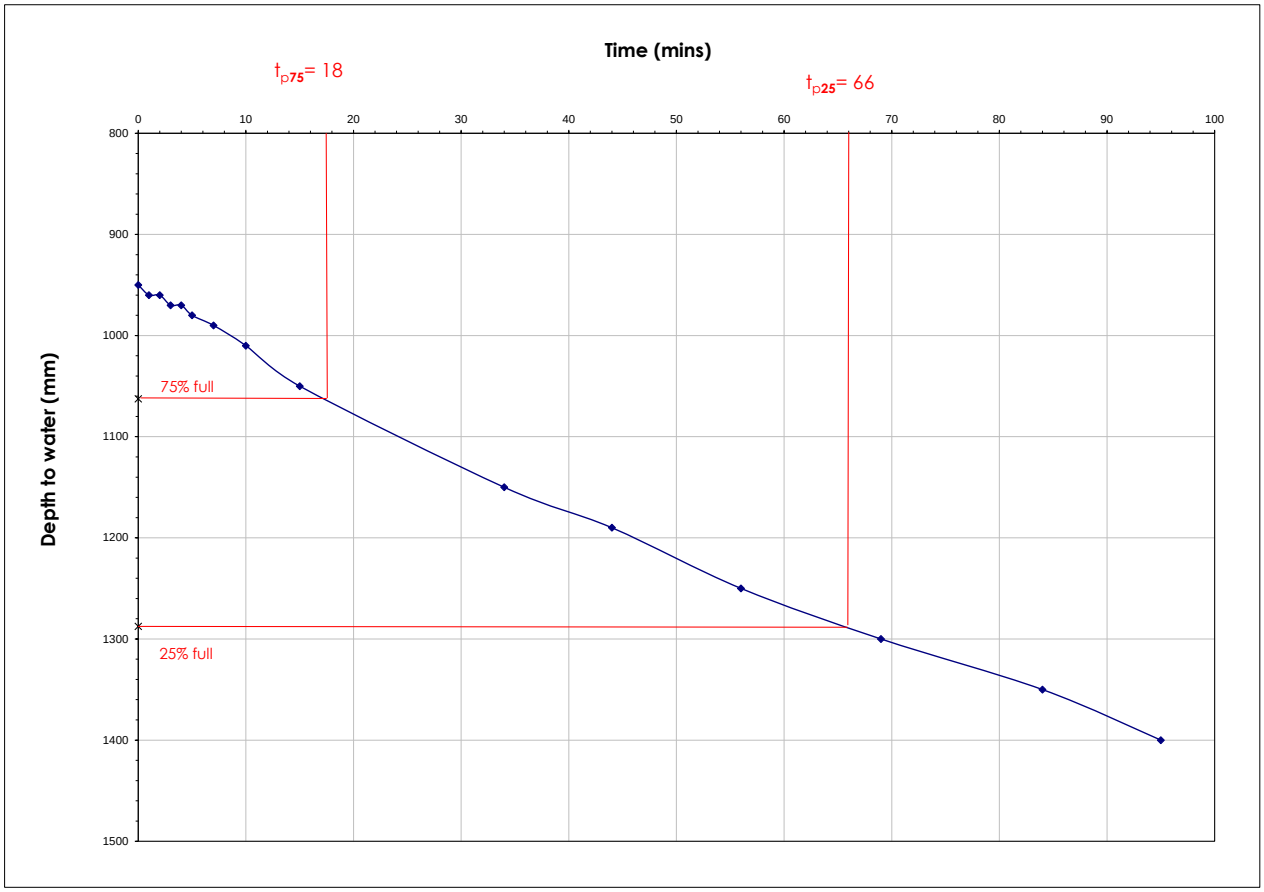
Time	Elapsed Time	Depth to water from ground level		
	(min)	(m)	(mm)	
10:51	0	0.95	950	
10:52	1	0.96	960	
10:53	2	0.96	960	
10:54	3	0.97	970	
10:55	4	0.97	970	
10:56	5	0.98	980	
10:58	7	0.99	990	
11:01	10	1.01	1010	
11:06	15	1.05	1050	
11:25	34	1.15	1150	
11:35	44	1.19	1190	
11:47	56	1.25	1250	
12:00	69	1.30	1300	
12:15	84	1.35	1350	
12:26	95	1.40	1400	DRY

SOAKAWAY TRIAL PIT			
Dimensions		**(m)**	**(mm)**
Length	=	2.50	2500
Width	=	0.65	650
Depth	=	1.40	1400

Effective Depth (% full)		**(mm)**	**(m)**
0.25	=	1287.5	1.29
0.50	=	1175	1.18
0.75	=	1062.5	1.06

Depth at start of test (mm)	=	950
Depth at end of test (mm)	=	1400
Base area of pit	=	1.625
a_{p50} - 50% internal surface area inc. base	=	3.0425
V_{p75-25} - Volume 75 - 25%	=	0.365625

Read from the graph:		
$t_{p\,75}$ (min)	=	18
$t_{p\,25}$ (min)	=	66



Soil infiltration rate, f, (m/s) = 4.17E-05

SOIL INFILTRATION RATE IN ACCORDANCE WITH BRE DIGEST 365: 1991

Client:	Vistry Homes, Countryside Partnerships & Miller Homes
Engineer	CD & EW
Job Name:	Black Cats
Job No.:	4486

Date:	**01/11/2023**
Trial Pit No.	**TP519**
Test No.	**2**

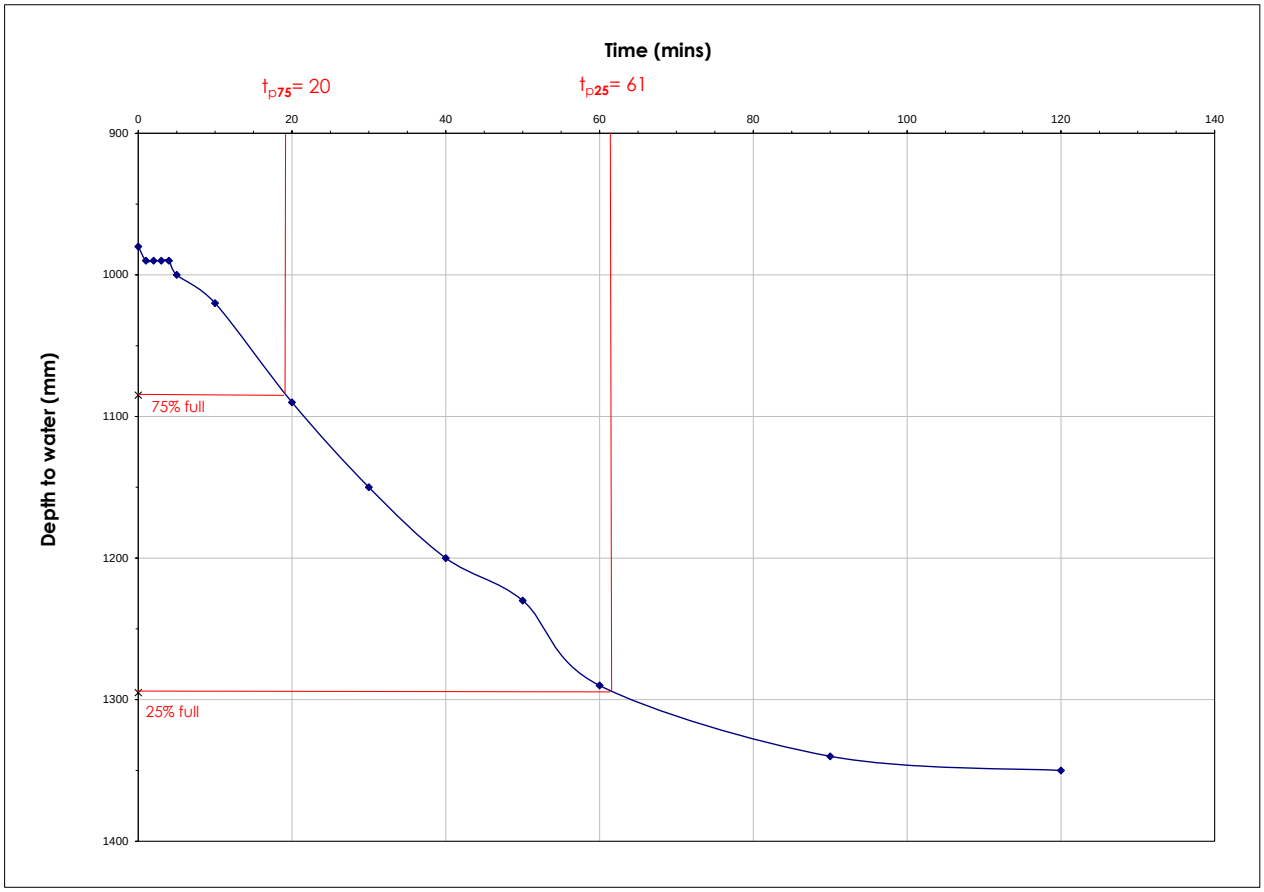
Time	Elapsed Time	Depth to water from ground level	
	(min)	(m)	(mm)
12:39	0	0.98	980
12:40	1	0.99	990
12:41	2	0.99	990
12:42	3	0.99	990
12:43	4	0.99	990
12:44	5	1.00	1000
12:50	10	1.02	1020
13:12	20	1.09	1090
13:29	30	1.15	1150
13:51	40	1.20	1200
14:08	50	1.23	1230
14:28	60	1.29	1290
14:49	90	1.34	1340
14:54	120	1.35	1350

SOAKAWAY TRIAL PIT			
Dimensions		**(m)**	**(mm)**
Length	=	2.50	2500
Width	=	0.65	650
Depth	=	1.40	1400

Effective Depth (% full)		**(mm)**	**(m)**
0.25	=	1295	1.30
0.50	=	1190	1.19
0.75	=	1085	1.09

Depth at start of test (mm)	=	980
Depth at end of test (mm)	=	1350
Base area of pit	=	1.625
a_{p50} - 50% internal surface area inc. base	=	2.948
V_{p75-25} - Volume 75 - 25%	=	0.34125

Read from the graph:		
$t_{p\,75}$ (min)	=	20
$t_{p\,25}$ (min)	=	61



Soil infiltration rate, f, (m/s) = 4.71E-05