C8023
NOVEMBER 2018

GEOENVIRONMENTAL APPRAISAL REPORT

of land to the north of
SCHOOL STREET, PHASE 3, THURNSCOE

prepared for
KEEPMOAT HOMES

REPORT TYPE:	**Geoenvironmental Appraisal**	**REPORT STATUS:**	**Final**
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EXECUTIVE SUMMARY

Introduction	Sirius Geotechnical Ltd (Sirius) were commissioned by Keepmoat Homes (Keepmoat) to undertake a geoenvironmental appraisal of land to the north of School Street, Thurnscoe, referred to as 'Phase 3' (the "site"). It is understood that consideration is being given to development of the site with approximately 311 low rise residential properties (not exceeding three storey) with associated gardens, areas of soft landscaping, hard surfaced roadways / hardstanding and areas of public open space (POS).
Site Details	The site is roughly rectangular in area. The main site area comprises a gently undulating agricultural field, with a central gulley associated with a drainage feature. A footpath is located within the southeastern area of the site, leading from School Street to a footbridge over the offsite railway to the east. An overgrown drainage ditch is located to the southeastern extent of the agricultural field. In addition, the site comprises two areas of land located to the south of the agricultural field, one north of Lingamore Leys, which is currently partly fenced off, and comprises a stockpile of sub-soil. The southwestern corner of the land off Lingamore Leys, is used by Keepmoat Homes for site cabins, staff parking and materials storage. The second portion of land is located east of School Street / Lingamore Leys and comprises undeveloped roughly surfaced land. The site is gently undulating and in general slopes from northwest to southwest and northeast to southwest, with minimum and maximum levels of approximately 47m Above Ordnance Datum (m AOD) and 58m AOD, according to the available topographic survey. A gulley runs northeast to southwest across the site. At the time of the site investigation works no water was flowing in the gulley, though anecdotal evidence suggests that the gulley flows during periods of high rainfall through winter and spring, with the southwestern area of the site historically flooding.
Site History	The site has largely remained in use as agricultural land. Residential development took place within the south of the site in the 1970's, until the properties were demolished and cleared in approximately 2009.
Fieldwork	The investigation, which was supervised by a Sirius Geoenvironmental Engineer, took place in September 2018 and comprised the excavation of thirty-six machine-excavated trial pits (plus five infiltration test pits) and the drilling of eight window sample boreholes. Five shallow hand dug pits were excavated to retrieve additional samples of topsoil within the southern and southeastern areas of the site where vehicular access was limited. Permanent monitoring installations for combined groundwater and ground gas monitoring were installed in each of the window sample boreholes.
Laboratory Testing	Selected samples of soils were tested for a range of potential contaminants under subcontract with Chemtest Ltd, a UKAS and MCERTS-accredited laboratory. Geotechnical laboratory testing on selected samples was carried out under subcontract by Professional Soils Laboratory (PSL), a UKAS-accredited laboratory.
Ground Conditions	The investigation has identified topsoil across the site, with made ground locally encountered to a depth of 1.10m bgl within the southwest of the site. Topsoil and localised made ground were in turn underlain by natural residual Pennine Upper Coal Measures Formation soils, to depths of between 0.70m and greater than 2.80m bgl. The weathering profile of the UCM was generally found to comprise high to very high strength clays underlain by highly weathered siltstone bedrock. Granular residual soils were encountered within the northern and eastern extents of the site, underlain by sandstone bedrock.

Ground Stability	Published geological information conjectures the Brierley Coal and an un-named thin coal seam to sub-crop approximately 70m and 300m north of the site, respectively, dipping towards the northeast away from the site. No shallow coal mining is recorded below, or within the vicinity of the site, and the site does not lie within a development high risk area. The recorded coal seams are considered to pose a low risk to surface stability. It would be prudent however to undertake rotary probing within the northern area of the site to assess the presence / absence of the Brierley Coal and any associated localised bell pits / crop workings to confirm this conclusion.
Soakaways	Although soakaways are generally unsuitable for the majority of the site, soakaway infiltration maybe locally viable within sandstone bedrock. Should soakaway infiltration be considered appropriate within this area of the site, additional testing should be undertaken to allow the full three fill cycles to be undertaken in accordance with BRE guidance.
Foundations and Floor Slabs	Spread foundations (strip and trench fill) could be taken down through the topsoil (and if encountered any localised made ground) into the underlying natural ground of adequate strength. It is considered for the proposed development, formations on natural materials are expected to predominantly comprise medium to high strength cohesive residual soils. Due to its shallow nature, some foundations will bear directly onto bedrock. There is the potential that cohesive soils may swell as they rehydrate through wetter periods of the year, resulting in ground heave. On this basis, heave protection measures are recommended to be adopted for foundations. Suspended floor slabs may be required where soil swelling may occur.
Sulphate Class	DS-1 and AC-2z. Further testing during enabling works may allow refinement of this assessment.
Contamination	No potentially unacceptable contaminant linkages exist for either site end-users or controlled waters.
Asbestos	ACMs were not observed within the soils encountered during this investigation.
Ground Gas	Interim ground gas monitoring results indicate that the site should be classified as Characteristic Situation 1, with no protection measures required. A further four ground gas monitoring visits are planned and the full results, and an interpretation of these, will be issued as an addendum letter on completion of the monitoring programme. No radon protection measures are required.
Invasive Species	An ecological survey should be carried out to confirm the absence of invasive plant species.
Other Issues	A surface water feature is recorded to run northeast to southwest across the site (although no evidence of the water feature was noted during fieldworks, other than a gulley) and existing live services are present including drainage. It is unclear which services are proposed to be either retained, diverted or disconnected as part of development proposals. Consideration should be given to any wayleaves / easements associated with the existing services.

The executive summary is an overview of the key findings and conclusions of the report. There may be other information contained in the body of the report which puts into context the findings of the executive summary. No reliance should be placed on the executive summary in isolation, particularly when deriving design detail/abnormal costs.

1. INTRODUCTION

Sirius Geotechnical Ltd (Sirius) was commissioned by Keepmoat Homes (Keepmoat) to undertake a geoenvironmental appraisal of land to the north of School Street, Thurnscoe, referred to as Phase 3 (the "site"), as defined by the red line shown on the Site Features Plan in Appendix A, as Drawing No. C8023/02.

It is understood that consideration is being given to the development of the site with 311 low rise residential properties (not exceeding three storey) with associated gardens, areas of soft landscaping, hard surfaced roadways / hardstanding and areas of public open space (POS). The proposed development is shown on Drawing No. 2238/06 Rev. C, Context Plan - Phases 2 and 3, dated July 2017 by Chris Gothard Architectural Ltd, presented in Appendix A of this report.

The objectives of this appraisal were to:

- Establish the historical development of the site and surrounding area from a review of available plans;
- Establish the environmental setting of the site;
- Investigate soil and groundwater conditions;
- Determine the potential risks posed by any ground contamination and provide recommendations on remedial measures to manage such risks;
- Establish the risks associated with hazardous ground gas;
- Provide advice relating to geotechnical issues associated with the site;
- Provide recommendations for highway / pavement design for the proposed development.

The desk study element of this investigation includes an assessment of information provided by Landmark Information Group (Envirocheck® Report), the British Geological Survey (BGS), the Coal Authority (CA), in addition to available online information provided by the Environment Agency (EA).

A site inspection (walk over survey) was undertaken by a Sirius geoenvironmental engineer on 24th August 2018.

Fieldwork was undertaken from 10th to 19th September 2018 and comprised the excavation of thirty-six trial pits and five infiltration test pits, and the drilling of eight window sample boreholes. Each of the eight window sample boreholes were installed with ground gas and groundwater monitoring standpipes. Excavation of five shallow hand dug pits was undertaken on 5th October 2018 within areas inaccessible to vehicles.

This report, which was designed to meet the requirements of relevant current guidance, presents the factual information available during this appraisal, an interpretation of the data obtained and recommendations relevant to the defined objectives.

It has been assumed in the production of this report that the site is to be developed for a low-rise residential with consumption of homegrown produce end use. In addition, it is assumed that ground levels will not change significantly from those described in this report. If these are not the case, then amendments to the recommendations made in this report may be required.

Where the report refers to the potential presence of invasive plants (such as Japanese Knotweed) or asbestos-containing materials (ACMs), such observations are for information only and should be verified by a suitably qualified expert.

The comments and opinions presented in this report are based on the findings of the desk study, ground conditions encountered during intrusive investigation works performed by Sirius and the results of tests carried out within one or more laboratories. There may be other conditions prevailing on the site which have not been revealed by this investigation and which have not been taken into account by this report. Responsibility cannot be accepted for any conditions not revealed by this investigation. Any diagram or opinion on the possible configuration of strata, contamination or other spatially variable features between or beyond investigation positions is conjectural and given for guidance only. Confirmation of ground conditions between exploratory holes should be undertaken if deemed necessary. Evaluation of ground gas and groundwater is based on observations made at the time of the investigation and monitoring visits. It should be noted that ground gas and groundwater levels and quality may vary due to seasonal and other effects.

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2. SITE DETAILS AND DESCRIPTION

Table 2.1 Current Site Overview

Location	The site comprises a roughly rectangular shaped plot of land, located to the north of School Street, in the village of Thurnscoe, located centrally between Barnsley and Doncaster town centres. A site location plan is provided as Drawing No. C8023/01 within Appendix A.
National Grid Reference (NGR)	445840mE, 406240mN
Topography and Features	The site is roughly rectangular in area, with approximate dimensions of 300m north-south by 350m east-west. The main site area comprises a gently undulating agricultural field, with a central gulley associated with a drainage feature. A footpath is located within the southeastern area of the site, leading from School Street to a footbridge over the offsite railway to the east. An overgrown drainage ditch is located to the southeastern extent of the agricultural field. In addition, the site comprises two areas of land located to the south of the agricultural field, one north of Lingamore Leys, which is currently partly fenced off, and comprises a stockpile of sub-soil. The southwestern corner of the land off Lingamore Leys, is used by Keepmoat Homes for site cabins, staff parking and materials storage. The second portion of land is located east of School Street / Lingamore Leys and comprises undeveloped roughly surfaced land. The main area of the site is accessed through a wire roped gate present at the northern extent of School Street. The additional site areas can be accessed from Lingamore Leys and School Street respectively. The site is gently undulating and in general slopes from the north to the southwestern site corner, with minimum and maximum levels of approximately 47m Above Ordnance Datum (m AOD) within the southwest and 58m AOD within the northwest. A gulley runs from the central northern site area to the southwest across the site, with historical maps indicating a former watercourse / drainage feature leading into a culvert. At the time of the site investigation works no water was

	flowing in the gulley, though anecdotal evidence suggests that water flows through the gulley during periods of high rainfall during winter and spring periods, with the southwestern area of the site historically flooding. Evidence suggest that the land holder may have historically raised levels within the southwest to minimise the extent of flooding occurring on-site. An underground electrical cable runs from the southeastern corner of the site towards the footbridge, at which point it converts to an overhead electrical cable. The overhead electricity cables are orientated approximately north-south located towards the eastern site boundary. A manhole chamber is present in the central eastern area of the site, associated with an approximately northwest-southeast orientated public water main.
Approximate Site Area	10.9 hectares.
Site Boundaries	The sites western boundary is formed by a series of hedgerows and trees, with residential properties beyond, while the northern boundary runs across open fields, with no definitive boundary demarcation. The sites eastern boundary is defined by a mixed wire and metal fence, leading onto railway land beyond. The southern boundary of the site is demarcated by residential properties towards the southeast, an area of undeveloped land in the central southern area and Lingamore Leys highway along the southwestern site boundary. Residential development is currently underway by Keepmoat to the south of the site.
Current Land Use	The site is currently in use as agricultural land. The parcels of land to the south are currently undeveloped, and partly used for placement of cabins, storage and stockpiling of sub-soils.
Invasive Plant Species	An ecological survey should be carried out to confirm the absence / presence of any invasive plant species.
Adjacent Land Uses	The surrounding land use to the south and west of the site is predominantly residential, with agricultural land located to the north. Railway land forms the eastern site boundary, with agricultural and residential land beyond.

The main site features are shown on Drawing No. C8023/02 within Appendix A.

3. ENVIRONMENTAL SETTING

3.1. Introduction

Published environmental, geological and historical data relating to the site has been reviewed. A summary of relevant information is provided below and a copy of the Envirocheck Report is enclosed in Appendix B. A copy of the Coal Authority Mining Report is included in Appendix C.

3.2. Site History

Table 3.1 presents a summary of the site history from 1851 to date. It is not the intention of this report to describe in detail all of the changes that have occurred on or adjacent to the site, only those pertinent to the proposed development.

Table 3.1 Site History

Map Dates	On-site Features	Offsite Features (only features within 500m that may affect the site are listed)
1851 – 1854	The site is shown as undeveloped land and is split into several agricultural fields. A surface water feature is located from the northern central area of the site to the southwestern site corner, leading off-site. An area of woodland is shown in the northern area of the site, to the west of the stream. Bridle Road is shown in the southeastern and eastern site area.	The surrounding area is predominantly used for agricultural purposes. The “Grange” is located approximately 200m to the southwest of the site, with an associated spring well. A sandstone quarry is shown approximately 330m to the northwest of the site.
1892 – 1907	The area of woodland is shown to have extended southwards with areas of rough grassland to the east. A new footpath is shown to cross the site, merging with the former Bridle Road. A small pond is shown at the northern extent of the surface water feature. The surface water feature is shown to be partly culverted below a footpath within the southwestern site corner.	A newly constructed railway line is shown orientated north-south along the site’s eastern boundary. The footpath within the site is shown as a bridge over the railway line. The sandstone quarry is no longer shown. The “Grange” is now labelled as “Low Grange” and the spring well is no longer shown. A second railway branch is shown to the east.
1930 – 1948	The areas of rough grassland are now shown as woodland named as “Whin Wood”. A second small pond is shown to the north of the woodland.	Residential properties have been developed to beyond the railway to the east and southeast of the site.

Map Dates	On-site Features	Offsite Features (only features within 500m that may affect the site are listed)
	Two small un-named structures are shown in the western central area of the site and in the northeastern area of the site. The two small structures are not shown after approximately 1932.	
1955 – 1967	The woodland is no longer shown. The second pond is no longer evident; a new drain is shown running north to south from the pond's former location, merging with the surface water course.	New residential development to the west of the site from 1961. The second railway line 50m to the east of the site is dismantled by 1961 and is no longer shown on OS maps after c.1989.
1970 – 2000	Approximately 20 no. residential properties are shown to have been developed in the southern and south western portion of the site. School Street highway is shown to partly impinge into the southern area of the site.	Further expansion of construction of residential properties to the south and southwest of the site. The surface water stream is shown to be partly culverted to the southwest below the new development.
2018	The residential properties in the south and southwestern portion of the site have been demolished. Online aerial images indicate demolition and clearance took place in approximately 2009. Online aerial images also indicate an area of vegetation adjacent to the surface water course within the southwestern site area in 2003. By 2009, this appears to have been cleared with possible localised earthworks.	No significant changes noted.

3.3. Published Geological Information

A summary of available published geological information is provided in Table 3.2.

Table 3.2 Geological Summary

Sources of Information	BGS 1:10,000 scale geological map (Sheet name, SE40NE). BGS 1:50,000 scale geological map (Barnsley, Sheet 87). BGS Geology of the Barnsley district: a brief explanation of the geological map sheet 87 Barnsley, dated 2007. BGS Geology of Britain Viewer (on-line service).

	BGS Lexicon of Named Rock Units (on-line service). BGS borehole records (on-line service). Coal Authority (CA) Interactive Map Viewer (on-line service). CA Consultants Mining Report, Ref: 178227804_2, dated 29th August 2018 Envirocheck Report, Ref: 178227804_1_1, dated 29th August, 2018
Made Ground	None recorded on the published maps but localised made ground may be present in the southwest of the site, associated with the historical development.
Superficial Deposits	No superficial deposits are recorded to underlie the site.
Solid Geology	The majority of the site is shown to be underlain by the Pennine Upper Coal Measures Formation (PUCMF) strata, comprising '*interbedded grey mudstone, siltstone and pale grey sandstone, commonly with coal seams…*' An arcuate sub-crop of Dalton (Newstead) Rock is present across the central western to central southern portions of the site, described within the BGS memoir as '*sandstone, yellow, feldspathic, micaceous*', and within the BGS lexicon as '*thickly bedded soft brown sandstone*'.
Mining and Quarrying	**Coal Seams:** The BGS map conjectures the Brierley Coal and an un-named thin coal seam to sub-crop approximately 70m and 300m north of the site, respectively, dipping towards the northeast away from the site. The Elmsall Coal is shown to sub-crop approximately 250m-350m to the south / southwest of the site, dipping towards the northeast below the site. The generalised vertical section for the local map sheet shows the Elmsall Coal seam to vary between 0.0m and 0.6m bgl in thickness. The Emsall Coal (at a recorded thickness of between 0.3m to 0.6m) is shown to stratigraphically sub-crop approximately 30m below the Brierley Coal.

		The 2007 BGS memoir for the site states '*The coal seams of the Upper Coal Measures are generally unproductive, being thin or dirty (mud-rich), and occur within a sequence dominated by sandstone*'. The memoir does include the Elmsall coal within a table of named coal seams within the district however, recorded at a thickness of between 0.0-0.6m, and recorded to have been '*?worked (opencast)*'.
	Coal Mining:	The CA report states that the site is in an area that could be affected by underground mining in seven seams of coal at 140m and 800m depth, last worked in 1981. The site is not in an area that could be affected by present underground mining and is not in an area likely to be affected from any planned future underground coal mining. The CA report states that the site is not within the boundary of an opencast site from which coal has been removed by opencast methods.
	Mine Entries:	The CA do not record any mine entries within, or within 20 metres of, the boundary of the site. The online CA interactive viewer indicates a number of mine entries from 790m southeast of the site.
	Quarries:	Historical OS maps indicate a former sandstone quarry located 330m northwest of the site, from at least 1851, up until approximately 1892.
BGS Recorded Mineral Sites	A BGS recorded mineral site is reported to be present 327m to the northwest of the site relating to a ceased opencast quarry, which appears to correlate with the historical quarry described above. The commodity is recorded as Carboniferous Dalton Rock Sandstone. A second ceased opencast sandstone quarry record is reported to be located 539m to the north.	

	Four ceased BGS recorded mineral sites are located between approximately 700m and 1km to the southeast of the site for 'common clay and shale' and 'coal - deep'. One BGS record located 964m to the southeast at 'Hickleton Colliery Methane' is classified as 'dormant', for the extraction of 'liquid or gas'.
BGS Borehole Records	BGS borehole records located approximately 320m and 600m northwest of the site (SE40NE19/C&D, dated from 1940) record ground conditions comprising 'clay' to depths of between 1.1m and 1.8m bgl, overlying 'splint coal' and 'coaly shale' at thicknesses of 0.1m and 0.15m respectively. The coal seam / shaley coal are recorded to be underlain by 'blue / grey metal' (considered to represent mudstones) to a maximum depth of 10m bgl. The coal seam may be representative of the thin un-named seam which is conjectured to sub-crop 300m to the north and is shown to be exposed within the railway cuttings to the northeast. Borehole records located along the eastern site boundary of the site (SE40NE20/A&B, dated from 1940) record 'clay' to 1.8m depth, underlain by 'blue / grey / brown metal' to a maximum depth of 6.0m bgl. These boreholes are recorded to be south of the conjectured subcrop of the Brierley coal seam. Two BGS borehole records are located 150m and 180m west and northwest of the site (ref. SE40NE49 and SE40NE50, dated from 1977 and 1978 drilled on behalf of Hickleton Colliery 'to prove the Thorncliffe Seam'). Both boreholes were open hole drilled to depths of 23m and 27m bgl, with no record of strata maintained. The remaining depths of the rotary holes were cored and logged in detail, with bands of mudstone and sandstone recorded to depths of 30m and 33m, underlain by variable bands of coal, mudstone / seatearth, carbonaceous mudstone, ironstone and 'dirt'. The combined bands were recorded at thicknesses of approximately 3m to 4m, underlain by mudstone and siltstone bands to maximum depths of 40m.

3.4. Hydrology and Hydrogeology

A summary of available information pertaining to hydrology and hydrogeology is presented in Table 3.3 to Table 3.5, inclusive.

Table 3.3 Surface Water Features

	Presence/location	Comments
Classified Watercourses (within 500m)	NR	N/A
Unclassified Watercourses (within 500m)	Several surface water feature records (classified as inland rivers) are present on-site, shown from the central northern site area to the southwest of the site.	A 'lake' is recorded adjacent to the northeastern site boundary (considered to represent a small pond shown on OS mapping).
Licensed Surface Water Abstractions (within 1000m)	NR	N/A
Other Surface Water Features (Canals, Ponds, Lakes, etc.) (within 250m)	NR	N/A
Flood Risk Status	Review of the EA website indicates the site to be located within a flood zone 1, with a low probability of flooding.	The EA recommend that a flood risk assessment is undertaken where the development is larger than 1 hectare.

NR - none recorded.

Table 3.4 Groundwater Occurrence and Abstraction

	Presence/location	Comments
Licensed Abstractions (within 1000m)	NR	N/A
Private Wells	NR	N/A
Source Protection Zones (within 500m)	NR	N/A

	Presence/location	Comments
Springs	NR	N/A

NR - none recorded.

Table 3.5 Groundwater Vulnerability Status

	Environment Agency Classification
Groundwater Classification	The bedrock beneath the site is classified as a Secondary A Aquifer, which is defined as "*having 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….*".

3.5. Landfilling and Waste Management

Information on waste management and related activities that could impact upon the site is summarised in Table 3.6.

Table 3.6 Waste Management Activities

	Presence / Location	Comments
Historical Landfills **(within 1000m)**	Three historical landfill records are located within 1km of the site.	The closest record is located 43m to the northeast of the site (recorded at the former railway cutting), with a last input date of 31st July 1982. The historical landfill is reported to have accepted 'Inert, Industrial, Commercial, Household and Special Waste and Liquid Sludge'. The second closest record located 355m northeast of the site refers to the same landfill. A third historical landfill record is located 628m to the southeast, named as Brickworks Quarry. The last input date was December 1980, with wastes

	Presence / Location	Comments
		specified as 'household'.
Registered and Local Authority Landfills **(within 1000m)**	Two registered landfills have been recorded within 1km of the site. Five local authority recorded landfill sites within 1k of the site.	The closest record is located 54m to the southeast of the site, relating to the historical railway cutting and is last dated 1st February 1981. The license is currently lapsed / cancelled and had no known restriction on source of waste. Waste types included a wide range of materials, including 'contaminated rubbish / bags' and 'sewage sludge'. A second registered landfill is recorded to be located 547m to the northeast, also relating to the former railway cutting. The license is currently lapsed / cancelled and was last dated from July 1978. Authorised wastes included demolition rubble and inert wastes. Four of the local authority recorded landfill sites are located between 51m to the east and 645m to the southeast, and all correspond with the landfill records detailed above. The fifth record is located 842m to the southeast with an 'unknown' last reported status.
Other Licensed Waste Management Facilities **(within 500m)**	NR	N/A
Evidence of Fly-Tipping on Site?	Occasional littering was noted around the site entrance and in the gully running along the southern boundary of the field.	N/A

	Presence / Location	Comments
Other Evidence of Waste Disposal on or within 250m of Site	Anecdotal evidence suggests that the landholder may have raised levels in the southwest of the site. No information on fill type was available.	N/A
Ground Gas Risk Assessment Required?	Yes.	Given the proximity of the historical / registered landfill to the east of the site, there is the potential for migration of hazardous ground gas into the site. It is recommended that a ground gas monitoring programme is undertaken to characterise the risk to the proposed development.

NR - none recorded

3.6. Radon Risk

The BGS and HPA "Indicative Atlas of Radon in England and Wales" and the assessment contained within the Envirocheck Report, indicate that the site lies within an area in which 1 to 3% of properties are above the action level and therefore **no radon protective measures are required**.

3.7. Ecological Receptors

The site is recorded to form part of an adopted green belt and to be within a nitrate vulnerable zone.

3.8. Other

Other potentially contaminative activities or environmental constraints are listed below. The entries relate to activities within approximately 250m of the site, with the exception of Control of Major Accident Hazards Sites (COMAH) where the assessment is extended to a distance of approximately 1km from the site.

- A substantiated pollution incident register record is located 187m to the southeast, categorised as a Category 2 - Significant Impact to land. The record is dated from 2003 and relates to ‘vehicles and vehicle parts’.

- The closest active trade directory entry is located 18m northwest of the site and relates to a wrought ironwork company.

4. PREVIOUS INVESTIGATION FINDINGS

A site investigation (and subsequent gas assessment letter reports) has previously been undertaken at the site, as detailed below. The initial site investigation was undertaken prior to demolition works within the south of the site:

- Brunswick Street and Reema Estate, Thurnscoe, South Yorkshire, Phase I/II Geoenvironmental Investigation for Barratt Sheffield, Project Ref. S7/032, dated October 2007, prepared by Abatech International Ltd (Abatech).

- Reema Estate, Thurnscoe, Supplementary Ground Investigation and Phase II Report Review for Keepmoat Homes, Project Ref. C3676A, dated March 2010, prepared by Sirius.

Phase I and II Geoenvironmental Investigation by Abatech International Ltd (October 2007)

Abatech completed site investigation works at the site, in addition to an area of land to the south collectively referenced as the 'Reema Estate'. An additional parcel of land referenced as Brunswick Street was also incorporated into the investigation. Only relevant information pertinent to the School Street, Phase 3 site is summarised below.

Site investigation works were undertaken at the School Street, Phase 3 site in September 2007, with fieldworks comprising the excavation of thirteen trial pits (TP01 to TP12, and TP22) and the drilling of seven window sample boreholes (WS05 and WS17 to WS22), three of which were installed with gas and groundwater monitoring wells (WS5, WS18 and WS21).

During the initial rounds of ground gas monitoring, only two of the three monitoring wells were monitored on-site, as the installation within WS21 had been vandalised. A peak carbon dioxide concentration of 0.9% was recorded within WS18, with no detectable gas flow rates. Groundwater levels varied between 2.35m and 2.42m bgl within WS18, whilst WS5 was found to remain dry.

Ground conditions generally comprised topsoil from ground level to depths of between 0.2m and 0.4m below ground level (bgl), overlying stiff to very stiff orangish brown occasionally mottled grey clay, with variable sand and gravel content, encountered to depths of between 0.7m and 1.9m bgl. An SPT 'N' value of 15 within the clay is indicative of high strength soils. Orange brown clayey sand was recorded directly below topsoil within exploratory holes towards the southwest of the site, in turn underlain by clays. These soils are considered representative of residual bedrock. Localised limestone sub-base made ground was recorded at a thickness of 0.15m within WS5 below topsoil.

The residual soils were found to grade into highly weathered sandstones and mudstones, proven to a maximum depth of 2.6m bgl. SPT 'N' values within the bedrock ranged from 17 to >50, representative of high strength soil to extremely weak rock.

Chemical laboratory testing undertaken on soil samples obtained from a number of exploratory holes across the site (WS5, WS19, WS21, TP2, TP4, TP6, TP8, TP9 and TP12) did not identify any contaminants of concern, although testing was limited to a suite of metals and PAH's. On the basis of the laboratory test results, Abatech considered that no specific remediation was likely to be required at the site, subject to further confirmatory works during demolition and enabling works. Ground gas monitoring was also recommended to be completed at the site.

On the basis of the site investigation, Abatech considered that strip/trench fill foundations would be suitable for a residential end use 'of typical construction', over-deepened where in the influence of trees. A tree survey was recommended.

Supplementary Ground Investigation and Phase 2 Report Review (dated March 2010)

Sirius completed supplementary ground investigation at the 'Reema Estate' site in February 2010, based on the recommendations for further works provided within the Abatech report. No access was provided within the main agricultural area of the site however. The supplementary site investigation (within the southern area of School Street, Phase 3 site area) comprised two trial pits (ref. SW2 and SW3) with subsequent soakaway infiltration testing and one window sample borehole (WS2), where access permitted. The window sample borehole was installed with a gas and groundwater monitoring well.

A subsequent ground gas investigation undertaken in 2011 included the installation of two gas and groundwater monitoring wells (WS5 and WS6), located within the southeast of the School Street, Phase 3 site area.

Ground conditions generally comprised reworked topsoil and cohesive made ground to depths of between 0.2m and 0.7m bgl, underlain by granular and cohesive residual soils. Mudstone and sandstone bedrock were encountered at depths of between 0.9m and 2.1m bgl.

Six ground gas monitoring visits were undertaken within WS2 at the site between March and July 2010. A peak and steady state concentration of 1.6% v/v carbon dioxide was recorded, with corresponding non-detected flow rates. Methane was not detected on any visit. The results are representative of Characteristic Situation 1 conditions.

Following discussion with the local authority, Sirius subsequently installed six additional gas and groundwater monitoring wells across the 'Reema Estate' area, two of which were included within the School Street, Phase 3 site area. Three additional gas monitoring visits were completed in March 2011, with generally low / non-detectable concentrations of methane and carbon dioxide recorded, with non-detect flows, also representative of Characteristic Situation 1 conditions. On the basis of the 'Reema Estate' site as a whole, Amber 1 precautions were recommended, with further monitoring and assessment recommended to allow the site to be further zoned into 'Green' and 'Amber 1' conditions (in accordance with guidance provided within Ciria C665).

Chemical laboratory testing undertaken on soil samples obtained from SW2 and SW3 did not identify any contaminants of concern. On the basis of the laboratory test results, it was considered that no extensive remedial measures were required, although a suitable clean cover methodology was recommended to be agreed with the regulators. Site won topsoils were recommended to be screened to remove anthropogenic materials and re-tested prior to re-use on site.

Further investigation was recommended across the agricultural area of the site, including pesticide analysis.

Soakaway infiltration tests were undertaken in the two trial pits; the water level in each of the infiltration test pits did not pass either the 75% or 25% effective depths within a 24-hour period. The results were therefore considered to represent poor infiltration, and that traditional shallow soakaways would not be feasible.

On the basis of the site investigation, it was considered that strip/trench fill foundations would be suitable for a residential end use 'of conventional construction'.

5. PRELIMINARY CONCEPTUAL SITE MODEL

Based on the desk study information, a combined preliminary conceptual site model and conceptual exposure model (CSM) has been developed for the proposed future land use (low rise residential with gardens). This summarises the understanding of surface and sub-surface features, the potential contaminant sources, transport pathways and receptors to assess potential contaminant linkages.

A qualitative risk assessment has also been made of each contaminant linkage operating following the methodology described in Appendix D. The preliminary CSM is presented in schematic form in Drawing No. C8023/03 in Appendix A.

In summary, the following potential contaminant linkages have been assessed as posing a potentially unacceptable level of risk (defined as being greater than “low” risk) in the proposed end-use:

- Inhalation and ingestion of, and dermal contact with, any localised made ground or topsoil/ shallow natural soils in which asbestos-containing materials (ACMs, inhalation only) or elevated concentrations of metals, metalloids, organic contaminants (including hydrocarbons and PAHs) or pesticides are present. These linkages are assessed as posing a **moderate** risk to future site users, construction workers and adjacent land users;

- Attack of construction materials (concrete and plastic) by sulphates and organic contaminants; this linkage is considered to pose a **low to moderate** risk to the built environment;

- Possible leachable heavy metals and organic contaminants in made ground and/or shallow natural soils posing a **low to moderate** risk to controlled waters (including underlying Secondary A Aquifer and on and offsite surface water features);

- Hazardous permanent ground gases resulting from putrescible materials or contaminants within made ground on and offsite posing a **moderate** risk to end users, adjacent site users and construction workers.

Invasive plant species may be present on or adjacent to the site but will pose a low risk to the built environment provided that an appropriate survey and, if required, a method of treatment / removal has been / will be undertaken.

6. FIELDWORK

6.1. Scope of Investigation

The information contained in this report is limited to areas of land accessible during the investigation within the site boundary, as indicated on the site plan presented in Appendix A as Drawing No. C8023/02.

The investigation, which was supervised by a Sirius Geoenvironmental Engineer, took place from 10th to 19th September 2018 and comprised:

- Excavation of thirty-six machine-excavated trial pits (TP01 to TP36) to a maximum depth of 2.80m bgl;
- Excavation of five infiltration trial pits (SA01 to SA04, including SA02A) to a maximum depth of 1.60m bgl;
- Drilling of eight window sample boreholes (WS01 to WS08) to a maximum depth of 2.00m bgl.

On 5th October 2018, five shallow hand dug pits (HP01 to HP05) were excavated to a maximum depth of 0.35m bgl in the southern and southeastern areas of the site to provide additional information on the ground conditions in these areas.

Permanent monitoring installations for combined groundwater and ground gas monitoring were installed in all of the window sample boreholes (WS01 to WS08).

6.2. Exploratory Hole Locations

The exploratory hole locations were selected using the findings of the preliminary conceptual site model in order to achieve general site coverage as detailed in Table 6.1. The principles given in BS 10175:2011+A2:2017 and BS EN 1997:2007 were followed when determining exploratory hole locations.

Table 6.1 Exploratory Hole Rationale

Exploratory Hole	Rationale
TP01 to TP36 WS01 to WS08	General coverage across accessible areas of the site to investigate the shallow soil and contamination profile.
SA01 to SA04 including SA02A	General coverage across accessible areas to allow infiltration testing in varying stratum.
HP01 to HP05	Shallow hand dug pits within southern and southeastern site areas (where access was restricted) to obtain shallow samples of topsoil / made ground / natural soils and confirm shallow ground conditions.

Access was available across the majority of the site area, although access was restricted for vehicular access along the eastern site boundary given the presence of overhead electricity mains. Access was also limited within the southern portions of the site which are currently in use as a compound and storage / stockpile area.

Several live services were present crossing the site, including a water main running northwest to southeast across the site, a sewer located within the south and electricity mains within the south and overhead electricity cables within the east.

Exploratory hole locations are shown on Drawing No. C8023/04 in Appendix A of this report.

6.3. Strata Description

Strata descriptions were logged in accordance with Eurocode 7. Detailed descriptions of strata and groundwater observations made during investigation works, together with samples recovered and the results of all in situ field testing, are presented on the Engineer's records in Appendix E. The depths of strata on the record sheets are recorded from current ground levels at each location, unless indicated otherwise.

6.4. Geotechnical Testing

Geotechnical laboratory testing on selected samples was carried out under subcontract by Professional Soils Laboratory (PSL), a UKAS-accredited laboratory.

Geotechnical and geochemical test results are included within Appendix F of this report.

6.5. Chemical Testing

Selected samples of the made ground, topsoil and natural soils were tested for a range of potential contaminants under subcontract with Chemtest, a UKAS and MCERTS-accredited laboratory.

The potential contaminants of concern identified by the preliminary conceptual site model were selected as the analytes for the samples recovered from the site. The results of soil analysis, as received from the laboratory, are presented in Appendix F of this report.

6.6. Soakaway Testing

Soakaway tests were undertaken to provide an indication as to the potential use / installation of soakaways on site.

Soakaway tests were carried out in four trial pits (Ref. SA01, SA02A, SA03 and SA04) in general accordance with the test method specified in BRE Digest 365 - Soakaway Design. Water was added to the excavation, to fill the test zone, using a water bowser. Owing to the slow speed of infiltration, soakaway tests were not repeated three times as defined within BRE 365. Soakaway tests were completed within cohesive and granular UCM residual soils and the underlying UCM bedrock.

Plots of water level against time are provided on the soakaway result sheets, contained within Appendix E of this report.

7. GROUND CONDITIONS AND MATERIAL PROPERTIES

7.1. Strata Profile

A summary of the strata profile encountered is provided in Table 7.1.

Table 7.1 Strata Profile

Strata	Depth Range (Thickness Range)	Description and Comments
Topsoil	Ground Level (0.20 to 0.40m)	Topsoil was encountered from ground level across the site, generally comprising brown, slightly clayey, slightly gravelly sand. Reworked topsoil was identified within exploratory holes SA02 and TP01 within the southwest of the site, including gravels of brick and pipe bedding material, and occasional fragments of plastic and plastic bag. Reworked topsoil was also recorded within hand dug pits HP01 to HP05, located within land to the south of Lingamore Lane and within land to the southeast. The reworked topsoil within the hand dug pits included fragments of brick and concrete, in addition to glass and plastic within HP04.
Made Ground	Ground level to 0.40m (0.05m - 0.70m)	Made ground was encountered beneath topsoil in SA02, comprising red-brown gravelly sand with moderate cobble content of brick, concrete and pipe bedding with occasional fragments of plastic, tile and carpet. Anecdotal evidence suggests that the made ground was placed in the southwest of the site to alleviate from localised historic flooding. A thin (0.05m thick) layer of cohesive made ground was encountered within HP02, with fragments of brick and concrete.

Strata	Depth Range (Thickness Range)	Description and Comments
Residual UCM soils	0.10m to 1.10m (0.30m to >2.40m)	Residual bedrock was encountered directly underlying topsoil and localised made ground across the site, comprising principally cohesive residual soils. Granular residual soils were locally recorded towards the northern and eastern extents of the site. Cohesive residual soils generally comprised stiff, to very stiff, high, to very high strength, low, to high plasticity, grey-mottled brown-yellow, slightly sandy, slightly gravelly clay, with gravels of siltstone and locally carbonaceous mudstone. Firm, medium strength cohesive soils were recorded within TP01 and SA02, encountered at a depth of between 1.50m and 2.40m bgl. Very stiff blue-grey clay with gravels of carbonaceous mudstone was noted within TP01 at a depth of 2.40m, proven to a maximum depth of 2.80m bgl. Stiff blue-grey clays were recorded within TP07 at a depth of between 1.30m and 1.80m bgl. Cohesive soils were found with fissuring and cracking on occasion, to a depth of approximately 1.0m bgl. Pale grey-brown sandy gravels and gravelly slightly clayey sands were recorded within several exploratory holes, typically grading into sandy cobbly gravels and sandstone bedrock. The soils recorded across the site are considered to represent residual UCM siltstones and sandstones.
UCM Bedrock	0.70m to >2.80m Base not proven	Extremely weak to very weak, distinctly to partially weathered UCM bedrock was identified across the site, at depths of between 0.70m and >2.80m bgl. UCM bedrock was recorded as comprising siltstones and sandstones, commonly recovered as gravelly clays and clayey gravels.

Strata	Depth Range (Thickness Range)	Description and Comments
		Exploratory holes were excavated / drilled to refusal within the bedrock, which varied at depths of between 0.80m and 2.70m bgl.

7.2. Material Properties

Topsoil and Made Ground

Water soluble sulphate (SO_4^{2-}) analyses performed on eighteen samples of reworked topsoil, topsoil and made ground recorded concentrations of between <10mg/l and 49mg/l, together with recorded pH ranging from 6.6 to 8.3. These results indicate a design sulphate class of DS-1 and an ACEC class of AC-1 in accordance with BRE Special Digest 1 (2005) for the design of buried concrete, based on natural ground designation and mobile groundwater conditions.

Residual / Competent UCM

Residual UCM

Water soluble sulphate (SO_4^{2-}) analyses performed on five samples of residual and competent UCM strata recorded concentrations of between <10mg/l and 58mg/l, together with recorded pH ranging from 5.1 to 8.2. These results indicate a design sulphate class of DS-1 and an ACEC class of AC-2z, in accordance with BRE Special Digest 1 (2005) for the design of buried concrete, based on natural ground designation and mobile groundwater conditions.

Ten Atterberg limit determinations undertaken on samples of cohesive residual UCM soils revealed liquid limits of between 32% and 53%, plastic limits of between 18% and 26%, and plasticity indices of between 14% and 27%. An Atterberg limit determination on a cohesive residual LCM soil obtained from TP24 at 0.9m bgl, recorded a liquid limit of 69%, a plastic limit of 29% and a plasticity index of 40%. This data indicates the cohesive residual LCM soils to be of variably low, to high plasticity.

The Consistency Indices (Ic) of the samples obtained indicate Ic values of between 1.05 and 1.47, indicative of very stiff consistency residual soils. Calculation of the modified Plasticity Index, in accordance with NHBC standards, indicates the material tested to have a typically low, to medium volume change potential.

Moisture contents taken within 20 residual UCM soils recorded values of between 11% and 33%. A plot of moisture contents with depth is included within Appendix F of this report, which indicates a general increase in moisture content with depth.

Nine SPTs undertaken within the cohesive residual soils recorded N values of between 15 and >50 blows for 30mm. Indicative undrained shear strengths of cohesive soils can be derived by applying a correlation to SPT 'N' values according to the material's plasticity, after Stroud (1975). Based on an average plasticity index of approximately 23% for the cohesive soils a correlation factor of 5 can be derived. Using Stroud's correlation, the SPT 'N' values indicates undrained shear strengths of between 75kPa and >250kPa (with mean and median values of 195kPa and 220kPa, respectively), indicating the cohesive soils to be of high, to very high strength.

Six hand shear vanes were undertaken within the cohesive residual soils, which identified undrained shear strengths typically ranging between Cu = 42kPa and 110kPa (with both mean and median values of 75kPa and 74kPa respectively), indicative of generally medium, to high strength material.

California Bearing Ratio (CBR) testing was undertaken on disturbed samples of the cohesive residual soils, following re-compaction in the laboratory using a 2.5kg rammer. The results of laboratory CBR testing are summarised in Table 7.2.

Table 7.2 Summary of CBR Testing

Sample Ref.	Depth (m bgl)	Moisture Content (%)	Bulk Density (Mg/m^3)	Dry Density (Mg/m^3)	CBR Value Top (%)	CBR Value Bottom (%)
TP09	0.6-0.8	13	1.91	1.69	22.6	24.7
TP26	0.4-0.6	24	1.94	1.56	26.2	30.7

Potential Desiccation in Clay Soils

The roots of vegetation can take water from the soil; in a clay soil, this may result in drying of the soil and consequent soil shrinkage and ground subsidence. As the soil re-hydrates, it can swell, resulting in ground heave. In accordance with guidance provided in BRE Digest 412 (dated February 1996), it is important to establish the extent and depth of any desiccation if possible, in clays soils as part of ground investigation, although there are no simple, reliable methods for carrying out such an assessment.

Comparisons of soil water contents with soil index properties can be assessed on a site-specific basis; the most commonly used criterion is that the onset of significant desiccation occurs when the soils water content is 0.4 times the liquid limit ($w<0.4w_l$). This method of detection is intended as an estimate only and is not intended to be a definitive assessment technique.

Table 7.3 below summarises the samples with moisture contents at 0.4 times the liquid limit. A plot of $w<0.4w_l$ with depth is included within Appendix F of this report.

Table 7.3 Summary of Samples with Moisture Content at or below 0.4 times Liquid Limit

Exploratory Hole	Depth (m bgl)	Liquid Limit (%)	Moisture Content (%)	0.4 times w_l
TP01	2.6	53	19	21.2
TP04	0.9	43	11	17.2
TP09	0.6	37	13	14.8
TP14	0.7	47	17	18.8
TP15	1.3	45	15	18
TP18	0.5	49	16	19.6
TP21	1.1	48	13	19.2
TP30	0.9	35	10	14

UCM Bedrock

Four in-situ SPTs undertaken within the highly weathered bedrock, comprising siltstones and sandstones, recorded N values of between >50 for 135mm penetration and >50 for 5mm penetration, with extrapolated N values of between 300 and 3,000. These SPT N values indicate the material to range from very high strength soil to very weak rock.

7.3. Obstructions

No sub-surface obstructions were encountered during the Sirius site investigation, although trial pits and window sample boreholes were found to refuse within competent siltstone and sandstone bedrock at depths of between approximately 0.8m and 2.7m bgl.

7.4. Ground Stability

Trial pits and boreholes were recorded to be stable during excavation / drilling.

7.5. Groundwater

Groundwater strikes recorded during the Sirius ground investigation are summarised in Table 7.4.

Table 7.4 Summary of Groundwater Encountered

Exploratory Hole	Depth Encountered During Fieldworks (m bgl)	Depth Encountered Post Fieldworks	Description	Stratum
TP01	2.8	N/A	Minor seepage	Cohesive residual UCM

N/A - Not Applicable

Subsequent groundwater monitoring has recorded each monitoring well to be dry.

It should be noted that the water levels are likely to fluctuate with the seasons/rainfall and therefore may be higher / lower at different periods of the year, compared to those recorded during this investigation.

7.6. Visual / Olfactory Evidence of Contamination

During our works, there was no olfactory or visual evidence of hydrocarbon or similar contamination.

7.7. Ground Gas

Ground gas monitoring has been undertaken in general accordance with the guidance given in CIRIA Report 151 “Interpreting Measurements of Gas in the Ground” (1995), CIRIA Report 655 “Assessing Risks Posed by Hazardous Ground Gases to Buildings”, (2007) and the British Standards BS 8485:2015 “Code of Practice for the Design of Protective Measures for Methane and Carbon Dioxide Ground Gases for New Buildings”.

For the purposes of gas risk assessment, the proposed development is considered to be characterised as comprising a Type A building (i.e. private housing with small room sizes), as defined in Table 3 of BS 8485:2015.

Ground gas monitoring has been carried out on two occasions to date. The results are summarised in Table 7.5. Full details of ground gas monitoring results are included in Appendix G.

Table 7.5 Summary of Gas Monitoring (2 visits only)

Well	Methane Peak (range) %v/v	Carbon Dioxide Steady State (range) %v/v	Oxygen (range) %v/v	Flow (steady) litres/hr
WS01	ND	0.2 - 0.3	20.4 - 20.5	ND
WS02	ND	0.1 - 0.3	20.5 - 20.6	ND
WS03	ND	0.4 - 0.5	20.3 - 20.5	ND
WS04	ND	ND - 0.1	20.7 - 20.8	ND
WS05	ND	0.2	20.4 - 20.7	ND
WS06	ND	0.2 - 0.4	20.4 - 20.5	ND
WS07	ND	0.1 - 0.4	20.4 - 20.5	ND
WS08	ND	0.4	20.3 - 20.6	ND

ND - Not Detected

The monitoring programme comprises six visits over a three-month period. On completion of this monitoring, a full set of results will be issued in an addendum letter.

8. RESULTS OF CHEMICAL TESTING

The results of chemical analysis are provided in full within Appendix F.

8.1. Assessment Methodology

Soil Data

The laboratory test data for the relevant soil strata were reviewed for completeness and consistency. Those determinands that represent potential contaminants of concern were subject to further evaluation.

For each potential contaminant of concern, analytical data for soil samples were evaluated against the relevant Generic Assessment Criterion (GAC), taking account of the Soil Organic Matter (SOM) content. For this site, measured values were compared to GACs derived for a residential with plant uptake end use. Source data for all GACs are provided in Appendix H.

If any samples recorded contaminant concentrations that exceeded that GAC, then consideration was given to the applicability of statistical data evaluation in line with the methods described for the Planning Scenario in CL:AIRE & CIEH “Guidance on Comparing Soil Contamination Data with a Critical Concentration”, May 2008.

8.2. Soil Analysis

Made Ground and Reworked Topsoil

Table 8.1 presents a summary of the analytical results obtained from three samples of reworked topsoil and one sample of granular made ground and their evaluation against the applicable GACs. Determinands recorded to exceed their relevant GACs have been subject to further assessment and evaluation.

Table 8.1 Summary of Total Soil Concentrations - Made Ground and Reworked Topsoil

Determinand	No. of Samples Tested	Range of Results (mg/kg unless specified)	GAC (mg/kg) (1% SOM)	No. of Samples >GAC	Samples Exceeding GAC
Metals					
Arsenic	4	12 - 25	37	0	
Cadmium	4	0.21 - 0.70	11	0	
Chromium (III)	4	18 - 41	910	0	

Determinand	No. of Samples Tested	Range of Results (mg/kg unless specified)	GAC (mg/kg) (1% SOM)	No. of Samples >GAC	Samples Exceeding GAC
Lead	4	20 - 58	200	0	
Inorganic Mercury	4	0.13 - 0.19	40	0	
Selenium	4	0.34 - 0.62	250	0	
Copper	4	23 - 30	200	0	
Nickel	4	16 - 41	130	0	
Zinc	4	73 - 140	450	0	
Inorganics					
pH	4	7.9 - 8.3	<5 - >9	0	
Total Sulphate	4	100 - 1200	2400	0	
Water Soluble Sulphate	4	<0.01 - 0.026 g/l	0.5 g/l	0	
Speciated PAH					
Acenaphthene	4	<0.1 - 0.21	200	0	
Anthracene	4	<0.1 - 0.36	2300	0	
Acenaphthylene	4	<0.1 - 0.24	170	0	
Benzo(a)anthracene	4	<0.1 - 1.3	*b(a)p**	0	
Benzo(b)fluoranthene	4	<0.1 - 1.5	*b(a)p**	0	
Benzo(k)fluoranthene	4	<0.1 - 0.73	*b(a)p**	0	
Benzo(g,h,i)perylene	4	<0.1 - 2.3	*b(a)p**	0	
Benzo(a)pyrene	4	<0.1 - 1.3	2.1	0	
Chrysene	4	<0.1 - 2.3	*b(a)p**	0	
Dibenzo(a,h)anthracene	4	<0.1 - 1.4	*b(a)p**	0	
Fluoranthene	4	<0.1 - 2.3	280	0	
Fluorene	4	<0.1 - 0.37	170	0	
Indeno(1,2,3-cd)pyrene	4	<0.1 - 1.6	*b(a)p**	0	
Naphthalene	4	<0.1 - 0.52	1.0	0	
Pyrene	4	<0.1 - 2.5	620	0	
Phenanthrene	4	<0.1 - 1.5	95	0	
Others					
Phenol	5	<0.3	110	0	
TOC	5	0.41 - 3.1	3% w/w	1	TP01 at 0.3m
Asbestos	5	NAD	NAD	0	

Table based on a Residential with Gardens end use (with consumption of home-grown produce). GAC - Stage 1 generic assessment criteria. * Assessed using benzo(a)pyrene as a surrogate marker, except where stated in text. # GAC has been derived in line with Sirius standard GAC. NAD – No Asbestos Detected.

No determinants were found to exceed their relevant GACs, with the exception of total organic carbon (TOC), which was recorded at a concentration marginally exceeding the relevant GAC within one reworked topsoil sample. TOC does not pose a potential risk to human health and is specified at the 'Inert' waste threshold for information purposes only.

Topsoil

Table 8.2 presents a summary of the analytical results obtained from thirteen samples of topsoil and their evaluation against the applicable GACs.

Table 8.2 Summary of Total Soil Concentrations - Topsoil

Determinand	No. of Samples Tested	Range of Results (mg/kg unless specified)	GAC (mg/kg) (1% SOM)	No. of Samples >GAC	Samples Exceeding GAC
Metals					
Arsenic	13	9.5 - 21	37	0	
Cadmium	13	0.11 - 0.36	11	0	
Chromium (III)	13	22 - 38	910	0	
Lead	13	29 - 50	200	0	
Inorganic Mercury	13	<0.1 - 0.11	40	0	
Selenium	13	0.27 - 0.83	250	0	
Copper	13	21 - 29	200	0	
Nickel	13	18 - 43	130	0	
Zinc	13	71 - 120	450	0	
Inorganics					
pH	13	6.6 - 7.8	<5 - >9	0	
Total Sulphate	13	360 - 930	2400	0	
Water Soluble Sulphate	13	<0.01 - 0.049 g/l	0.5 g/l	0	
Speciated PAH					
Acenaphthene	13	<0.1 - 0.23	200	0	
Anthracene	13	<0.1 - 0.32	2300	0	
Acenaphthylene	13	<0.1 - 0.32	170	0	
Benzo(a)anthracene	13	<0.1 - 0.27	*b(a)p**	0	
Benzo(b)fluoranthene	13	<0.1 - 0.46	*b(a)p**	0	
Benzo(k)fluoranthene	13	<0.1 - 0.57	*b(a)p**	0	
Benzo(g,h,i)perylene	13	<0.1 - 0.44	*b(a)p**	0	
Benzo(a)pyrene	13	<0.1 - 1.4	2.1	0	
Chrysene	13	<0.1 - 0.75	*b(a)p**	0	
Dibenzo(a,h)anthracene	13	<0.1 - 0.31	*b(a)p**	0	
Fluoranthene	13	<0.1 - 0.74	280	0	
Fluorene	13	<0.1 - 0.13	170	0	
Indeno(1,2,3-cd)pyrene	13	<0.1 - 0.2	*b(a)p**	0	
Naphthalene	13	<0.1 - 0.24	1.0	0	
Pyrene	13	<0.1 - 0.73	620	0	
Phenanthrene	13	<0.1 - 0.55	95	0	
Speciated TPH					
Aliphatic EC 5-6	3	<1	24	0	
Aliphatic EC >6-8	3	<1	53	0	
Aliphatic EC >8-10	3	<1	13	0	

Determinand	No. of Samples Tested	Range of Results (mg/kg unless specified)	GAC (mg/kg) (1% SOM)	No. of Samples >GAC	Samples Exceeding GAC
Aliphatic EC >10-12	3	<1	62	0	
Aliphatic EC >12-16	3	<1	510	0	
Aliphatic EC >16-35	3	<1	41000	0	
Aromatic EC 5-7	3	<1	53	0	
Aromatic EC >7-8	3	<1	100	0	
Aromatic EC >8-10	3	<1	20	0	
Aromatic EC >10-12	3	<1	63	0	
Aromatic EC >12-16	3	<1	140	0	
Aromatic EC >16-21	3	<1	260	0	
Aromatic EC >21-35	3	<1	1100	0	
BTEX and Related					
Benzene	3	<0.001	0.063	0	
Toluene	3	<0.001	100	0	
Ethylbenzene	3	<0.001	26	0	
Xylenes (total)	3	<0.001	28	0	
MTBE	3	<0.001	31	0	
Others					
Phenol	13	<0.3	110	0	
TOC	13	0.78 - 2.2% w/w	3% w/w	0	
Asbestos	9	NAD	NAD	0	

Table based on a Residential with Gardens end use (with consumption of home-grown produce). GAC - Stage 1 generic assessment criteria. * Assessed using benzo(a)pyrene as a surrogate marker, except where stated in text. # GAC has been derived in line with Sirius standard GAC. NAD – No Asbestos Detected.

No determinants were found to exceed their relevant GACs. No pesticides were detected above the laboratory limit of detection within two topsoil samples tested.

Natural Ground

Table 8.3 presents a summary of the analytical results obtained from natural soils and their evaluation against the applicable GACs.

Table 8.3 Summary of Total Soil Concentrations - Natural Soils

Determinand	No. of Samples Tested	Range of Results (mg/kg unless specified)	GAC (mg/kg) (1% SOM)	No. of Samples >GAC	Samples Exceeding GAC
Metals					
Arsenic	2	13	37	0	
Cadmium	2	<0.1 - 0.24	11	0	
Chromium (III)	2	17 - 33	910	0	

Determinand	No. of Samples Tested	Range of Results (mg/kg unless specified)	GAC (mg/kg) (1% SOM)	No. of Samples >GAC	Samples Exceeding GAC
Lead	2	22 - 26	200	0	
Inorganic Mercury	2	<0.1 - 0.11	40	0	
Selenium	2	0.34 - 0.76	250	0	
Copper	2	22 - 23	200	0	
Nickel	2	22 - 26	130	0	
Zinc	2	32 - 77	450	0	
Inorganics					
pH	7	5.1 - 8.2	<5 - >9	0	
Total Sulphate	2	230	2400	0	
Water Soluble Sulphate	5	<0.01 - 0.058 g/l	0.5 g/l	0	
Speciated PAH					
Acenaphthene	2	<0.1	200	0	
Anthracene	2	<0.1	2300	0	
Acenaphthylene	2	<0.1	170	0	
Benzo(a)anthracene	2	<0.1	*b(a)p**	0	
Benzo(b)fluoranthene	2	<0.1	*b(a)p**	0	
Benzo(k)fluoranthene	2	<0.1	*b(a)p**	0	
Benzo(g,h,i)perylene	2	<0.1	*b(a)p**	0	
Benzo(a)pyrene	2	<0.1	2.1	0	
Chrysene	2	<0.1	*b(a)p**	0	
Dibenzo(a,h)anthracene	2	<0.1	*b(a)p**	0	
Fluoranthene	2	<0.1	280	0	
Fluorene	2	<0.1	170	0	
Indeno(1,2,3-cd)pyrene	2	<0.1	*b(a)p**	0	
Naphthalene	2	<0.1	1.0	0	
Pyrene	2	<0.1	620	0	
Phenanthrene	2	<0.1	95	0	
Speciated TPH					
Aliphatic EC 5-6	3	<0.01	24	0	
Aliphatic EC >6-8	3	<0.01	53	0	
Aliphatic EC >8-10	3	<0.1	13	0	
Aliphatic EC >10-12	3	<0.1	62	0	
Aliphatic EC >12-16	3	<0.1	510	0	
Aliphatic EC >16-35	3	<0.1	41000	0	
Aromatic EC 5-7	3	<0.01	53	0	
Aromatic EC >7-8	3	<0.01	100	0	
Aromatic EC >8-10	3	<0.1	20	0	
Aromatic EC >10-12	3	<0.1	63	0	
Aromatic EC >12-16	3	<0.1	140	0	
Aromatic EC >16-21	3	<0.1	260	0	
Aromatic EC >21-35	3	<0.1	1100	0	
BTEX and Related					

Determinand	No. of Samples Tested	Range of Results (mg/kg unless specified)	GAC (mg/kg) (1% SOM)	No. of Samples >GAC	Samples Exceeding GAC
Benzene	3	<0.0002	0.063	0	
Toluene	3	<0.0002	100	0	
Ethylbenzene	3	<0.0002	26	0	
Xylenes (total)	3	<0.0002	28	0	
MTBE	3	<0.0002	31	0	
Others					
Phenol	4	<0.3	110	0	
TOC	1	<0.2 - 0.82% w/w	3% w/w	0	

Table based on a Residential with Gardens end use (with consumption of home-grown produce). GAC - Stage 1 generic assessment criteria. * Assessed using benzo(a)pyrene as a surrogate marker, except where stated in text. # GAC has been derived in line with Sirius standard GAC. NAD – No Asbestos Detected.

No determinants recorded concentrations above the relevant GAC within the natural soils tested.

9. REVISED CONCEPTUAL SITE MODEL

The preliminary combined conceptual site model and conceptual exposure model, developed from the desk study information and presented in Section 5, has been revised in light of the ground investigation and the chemical analysis results presented above.

The revised conceptual model has been developed for the proposed future land use (residential with consumption of homegrown produce). This summarises the understanding of surface and sub-surface features, the potential contaminant sources, transport pathways and receptors. The revised conceptual model is presented in schematic form in Appendix A, Drawing No. C8023/05.

9.1. Summary of Residual Contaminant Linkages

The qualitative risk assessment of identified contaminant linkages has also been revised, following the methodology described in Appendix D. In summary, the revised CSM has not identified any residual contaminant linkages (defined as being greater than “low” risk) that could result in an unacceptable risk in the proposed end-use.

An assessment of the risk to the proposed development from hazardous ground gases is yet to be finalised following completion of the ground gas monitoring programme.

10. CONCLUSIONS AND RECOMMENDATIONS

10.1. General

This geoenvironmental appraisal has been performed for land off School Street, Thurnscoe.

It is understood that consideration is being given to development of the site with approximately 311 low rise residential properties (not exceeding three storey) with associated gardens, areas of soft landscaping, hard surfaced roadways / hardstanding and areas of public open space (POS). The proposed development is shown on Chris Gothard Architectural Ltd. Drawing No. 2238/06 Rev. C, presented in Appendix A. No proposed development levels have been provided to Sirius to date.

It has been assumed that ground levels will not change significantly from those described in this report. If these are not the case, then amendments to the interpretation and conclusions in this report may be required.

10.2. Flood Risk

A review of the EA website indicates that the site lies within a Flood Zone 1, with a low probability of flooding. A Flood Risk Assessment is likely to be required under the National Planning Policy Framework (NPPF) given the area of the site is greater than 1 ha.

10.3. Geotechnical

Mining and Quarrying

Published geological information conjectures the Brierley Coal and an un-named thin coal seam to sub-crop approximately 70m and 300m north of the site, respectively, dipping towards the northeast away from the site. The Elmsall Coal is shown to sub-crop approximately 250m-350m to the south / southwest of the site, dipping towards the northeast below the site. No shallow coal mining is recorded below, or within the vicinity of the site, and the site does not lie within a development high risk area.

Based on these assumptions, the recorded coal seams are considered to pose a low risk to surface stability. It would be prudent however to undertake rotary probing within the northern area of the site to assess the presence / absence of the Brierley Coal and any associated localised bell pits / crop workings to confirm this conclusion.

No mine entries are known to exist on the site. However, the possibility of encountering unrecorded mine entries should not be discounted. It is recommended that all excavations are examined for evidence of mine entries. If a mine entry is suspected, advice should be sought immediately from a suitably qualified engineer.

Inspection of historical OS plans has not revealed any evidence of quarrying or pitting beneath the site. The possibility of encountering unrecorded quarries / pits cannot however be discounted. It is recommended that excavations be examined for evidence of such features. If evidence of an infilled quarry / pit is suspected, works should cease, and the advice sought of a suitably qualified consultant.

Foundations

The investigation has identified topsoil across the site to depths of between 0.20m and 0.40m bgl. Made ground was locally encountered to a depth of 1.10m bgl within the southwest of the site. Topsoil and localised made ground were in turn underlain by natural residual Pennine Upper Coal Measures Formation (UCM) soils, to depths of between 0.70m and greater than 2.80m bgl. The weathering profile of the UCM was generally found to comprise high, to very high strength clays underlain by highly weathered siltstone bedrock. Granular residual soils were encountered within the northern and eastern extents of the site, underlain by sandstone bedrock.

Topsoil and localised pockets of reworked topsoil / made ground are unlikely to be encountered at formation level. Notwithstanding this observation, it is considered that these strata are unsuitable to support structural loads associated with this development owing to the possibility of bearing capacity failure and excessive total / differential settlements.

It is therefore recommended that the most suitable foundation solution would comprise spread foundations (strip and trench fill) taken down through the topsoil (and if encountered any localised made ground) into the underlying natural ground of adequate strength. It is considered for the proposed development, that the natural materials at foundation depth are predominantly expected to comprise high strength cohesive residual soils.

The underlying cohesive residual soils (at least firm in consistency and medium in strength) are considered to have a characteristic undrained shear strength (Cu) of at least 70kPa, at a founding depth of 0.9m bgl. By way of example, calculations indicate a 0.60m wide strip, bearing on the cohesive residual soils (at least medium strength) at a depth of 0.9m bgl, can impose a maximum line load of 90kN/m run. It is anticipated, in view of the nature of this material, that the application of such a pressure would keep settlements to 25mm or less.

Foundations placed into cohesive residual soils should be a minimum of 900mm deep (below finished or original ground levels, whichever is the lower), locally deepened within the zone of influence of existing or proposed trees.

A tree survey was beyond the scope of this investigation but should be undertaken, in light of trees being present along some of the site boundaries, to enable production of a detailed foundation schedule. The removal of trees during development of the site may cause heave of cohesive soils and heave protection measures should be adopted in foundation design where appropriate.

The geotechnical laboratory test results indicate that the residual cohesive soils generally have low moisture contents, which may be partly a result of a sustained period of dry weather during the Summer of 2018, in conjunction with vegetation (crops) growth. Notwithstanding the above, owing to the nature of formation of residual soils, these materials are also expected to have inherently low moisture contents. There is, in theory, the potential that these cohesive soils may swell as they rehydrate through wetter periods of the year, resulting in ground heave. On this basis, heave protection measures designed in accordance with NHBC Chapter 4.2 (section 4.2.10) are recommended to be adopted for foundations bearing within and onto residual cohesive soils.

For foundations constructed on medium dense granular residual soils, a minimum angle of shearing resistance (Φ') of 30º could be assumed. For preliminary foundation design and in accordance with Eurocode 7, a 0.60m wide strip footing at a depth of 0.5m bgl could support a design loading of 90kN/m run. Calculations indicate that for the above foundation size and loading scenario, settlement should be below 25mm.

In the event granular soils are encountered, foundations bearing upon granular residual soils should be placed a minimum of 500mm below finished ground level to alleviate any effects arising from frost heave beneath the foundation.

The settlement performance of cohesive and granular materials is fundamentally different. In the event foundations bear directly upon a mix of cohesive and granular residual soils, it is recommended that the settlement performance between foundation types is calculated / assessed. At this stage, reinforcement of foundations, to cater for potential differential settlement of natural cohesive and granular deposits is considered appropriate to mitigate the effects of differential settlements.

It is anticipated that bedrock may locally be encountered at shallow depth across the site. If foundation excavations encounter bedrock, it is recommended that all the foundation for an individual plot be deepened in order to bear upon a consistent stratum and thus limit the potential for unacceptable differential settlements. The recommended line load provided above is unlikely to exceed the bearing resistance of weathered siltstone / sandstone. Should the depth to rock be found to slope below proposed foundations, foundations may need to be stepped down to ensure that the foundation bears entirely onto the weathered rock.

The above calculations are based on theoretical foundations. Settlement of foundations upon granular and cohesive materials are dependent on foundation loading and dimensions. It is therefore recommended that foundation settlements are reviewed once final loading arrangements and foundation sizes are known.

General Foundation Considerations

Foundations should be taken below a line drawn up at 45° from the base of any existing or proposed services.

It should be noted that any groundwater encountered may have an adverse effect on foundation construction and performance, particularly in winter months (such as softening / loosening of founding materials / instability of excavation walls etc). This should be considered when designing foundations.

If any areas of deep made ground are encountered, or greater structural loads are anticipated, alternative foundation solutions may be required.

Floors

In accordance with current NHBC Standards 2018 and based on proven ground conditions it is considered that suspended floor slabs are likely to be required on the basis of possible soil swelling.

At the time of writing ground gas monitoring is incomplete. In view of this, it would be prudent at this stage, to give some consideration to any gas protection measures required to be incorporated into the floor slab design.

Sulphate Attack

Based on the samples tested, a Design Sulphate Class of DS-1 and an ACEC Class of AC-1 should be used for buried concrete structures coming into contact with topsoil or made ground and a Design Sulphate Class of DS-1 and an ACEC Class of AC-2z should be used for buried concrete structures installed within residual UCM soils and bedrock. Further testing of the residual soils during enabling works may allow refinement of this assessment.

Groundworks, Excavation Stability and Groundwater Dewatering

Excavations into the underlying natural soils should be assumed to be unstable. No personnel entry into unsupported excavations shall be allowed without an appropriate risk assessment. Reference to CIRIA report 97 (1992) should be made to establish suitable means of support or battering of excavation sides.

Given the presence of shallow bedrock across the site area, it is recommended that provision be made for a pneumatic breaker, to allow the excavation of service trenches and any deeper excavations.

Based on the results of this investigation, minor groundwater seepages or inflows within shallow excavations (<1.0m) are considered unlikely across the site. However, if groundwater is encountered at shallow depth then it should be possible to deal with seepages through normal site pumping practices for any shallow excavations open for short periods of time. Disposal / discharge of water will require appropriate treatment / consent.

It is recommended that an adequate drainage system for surface water be installed by a competent contractor in order to prevent surface water ponding or collecting both during and post construction, as this may lead to deterioration of the founding stratum.

To reduce the possibility of softening or swelling of cohesive soils at the base of foundation trenches, these should be suitably blinded with concrete in the event foundation concrete is not poured imediately.

Pavements and Highways

Following a topsoil strip it is likely that residual soils will be encountered at sub grade.

Based on a visual inspection of the natural soils and using laboratory measurements of Plasticity Index, it is possible to estimate the CBR using Table 5.1 Equilibrium Subgrade CBR Estimation from within Highways Agency publication “Interim Advice note 73/06 Revision 1 (2009), Design Guidance for Road Pavement Foundations”. Taking into consideration the range of estimated CBR and laboratory results, an indicative CBR value of 3% is recommended on the cohesive residual soils and an indicative CBR value of 5% for granular residual soils.

Notwithstanding the above, it is recommended that in-situ CBR testing be carried out along the alignment of proposed highways, following completion of the enabling works and when final site levels will be known.

All road design should be discussed with the relevant local authority if highways are to be subject to a Section 38 Agreement.

Soakaways

Infiltration tests were undertaken within four trial pits to determine infiltration rates for the potential use of soakaways on the sites. At the time of the intrusive works, the design invert level of the soakaway discharge pipe or soakaway base was not known. The infiltration rate is calculated from the time taken for the water level within the pit to fall from 75% to 25% of the effective depth of the test pit.

The water level in the infiltration test pits SA01, SA02A and SA03 (undertaken within residual cohesive soils and siltstone bedrock) did not pass the 25% effective depths within a 24-hour period, and therefore soakaways are not considered viable in these ground conditions.

Within infiltration test pit SA04 (undertaken within sandstone bedrock), the water level fell from the 75% to 25% effective depth within a period of approximately 11.5 hours, with an indicative infiltration rate of 3.16×10^{-6} m/s. This indicates that soakaway infiltration maybe viable within sandstone bedrock; it should be noted that due to time constraints only one fill cycle was possible. Should soakaway infiltration be considered appropriate within this area of the site, additional testing should be undertaken to allow the full three fill cycles to be undertaken in accordance with BRE guidance.

It is recommended that the Local Authority and the EA be consulted with respect to any proposed soakaway drainage for the site.

Surface Watercourse and Services

A surface water feature is recorded to run northeast to southwest across the site (although no evidence of the water feature was noted during fieldworks, other than a gulley) and existing live services are present including drainage. It is unclear which services are proposed to be either retained, diverted or disconnected as part of development proposals.

Consideration should be given to any wayleaves / easements associated with the existing services.

10.4. Asbestos-Containing Materials

Asbestos containing materials (ACMs) were not observed within the soils encountered during this investigation.

However, the possibility of fragments of asbestos-containing materials within localised made ground / shallow natural soils cannot be discounted. If encountered, advice should be sought from an appropriately qualified asbestos specialist and an appropriate strategy developed for the safe removal and disposal of the material.

10.5. Soil and Groundwater Contamination

Risk Evaluation for the Proposed Land Use (residential with consumption of homegrown produce)

The revised conceptual site model indicates that no potentially unacceptable contaminant linkages exist for either site end-users or controlled waters.

Localised made ground soils and reworked topsoils have not been found to contain elevated concentrations of contaminants that are considered to present an unacceptable risk to human health or controlled waters. The made ground soils have however been found to contain fragments of brick and concrete and are considered texturally unsuitable to remain at shallow depth in residential gardens.

Utilities

It is recommended that the results of the chemical testing are provided to the appropriate utility companies to determine the necessity for service protection.

Two samples were obtained as part of the Sirius investigation, and were tested for a suite of determinands considered to pose a risk to water pipes. The laboratory analyses have generally indicated that these soils are suitable for the use of PE pipework. However, it is recommended that once final site levels, the depth in which the pipes are to be placed and the material in which they will placed within are confirmed, that this information is reviewed in relation to the actual development layout and site drainage design.

Outline Remediation Requirements

Based on the findings of this investigation, no specific remedial works are considered necessary for the proposed development.

A localised area of made ground soil (SA02 AND HP02) encountered in the southwest of the site is considered texturally unsuitable to remain at shallow depth within residential garden areas or areas of public open space. The made ground soils should be removed from areas of proposed gardens and soft landscaping and placed and compacted in a controlled manner below areas of proposed hardstanding.

Where gardens and areas of soft landscaping are directly underlain by natural ground, a nominal 100mm depth of suitable topsoil should be placed to provide a suitable medium for plant growth. It is recommended that site-won topsoil should be stockpiled, and further tested and assessed, as part of enabling works, before being approved for re-use. The re-use of site won topsoil would be subject to regulatory approval.

Based on the laboratory test results, it is considered that the reworked topsoil material encountered within the south of the site is chemically suitable for re-use within proposed gardens / landscaped areas, subject to prior removal of any man-made / oversize and deleterious materials.

It is possible that areas of more significant contamination not identified to date may be encountered on-site during excavation and construction works. If any areas of noxious, odorous, brightly coloured, fibrous, liquid or other potential contamination are encountered, then further advice should be sought from a suitably qualified consultant.

In the event any soils are removed from site, this activity should be undertaken in accordance with the current Duty of Care regulations, the EC Landfill Directive and the EA Technical Guidance Document WM3, dated 2015. Chemical results should be forwarded to suitably licensed soil treatment centre and/or landfill operators to determine disposal options.

10.6. Ground Gas

A summary of the ground gas monitoring results to date within the site are provided below. Calculated Q_{hg} (Quantity of Hazardous Gas) and Gas Screening Values (GSVs) are provisional only and may be subject to change based on future monitoring data.

The results to date have revealed no detectable methane concentrations and maximum steady state carbon dioxide concentrations of 0.5% v/v. A maximum peak negative flow rate of -1.6 litres/hour and a maximum positive peak flow rate of 0.3 litres/hour have been recorded, with no detectable steady flow rates. Based on these data, worst case Q_{hg} values of 0.0016 litres/hour for methane and 0.0005 litres/hour for carbon dioxide have been calculated. If these values are applied as provisional GSVs for the site, then the results are indicative of a very low hazard potential, characterised as Characteristic Situation 1 (CS1), as defined in Table 2 of BS8485:2015, with no ground gas protection measures required.

The above indicative assessment must be regarded as interim. A further four ground gas monitoring visits are planned and the full results, and an interpretation of these, will be issued as an addendum letter on completion of the monitoring programme.

Radon protection measures are not required by current guidance for the proposed development on this site.

10.7. Invasive Plants

Invasive plant species were not observed on this site at the time of investigation.

It is recommended that the absence / presence of invasive plant species is confirmed by qualified consultant ecologist and their advice taken on any appropriate treatment if required. The treatment of any invasive species should take place in advance of the proposed construction works.

10.8. Disposal of Soils

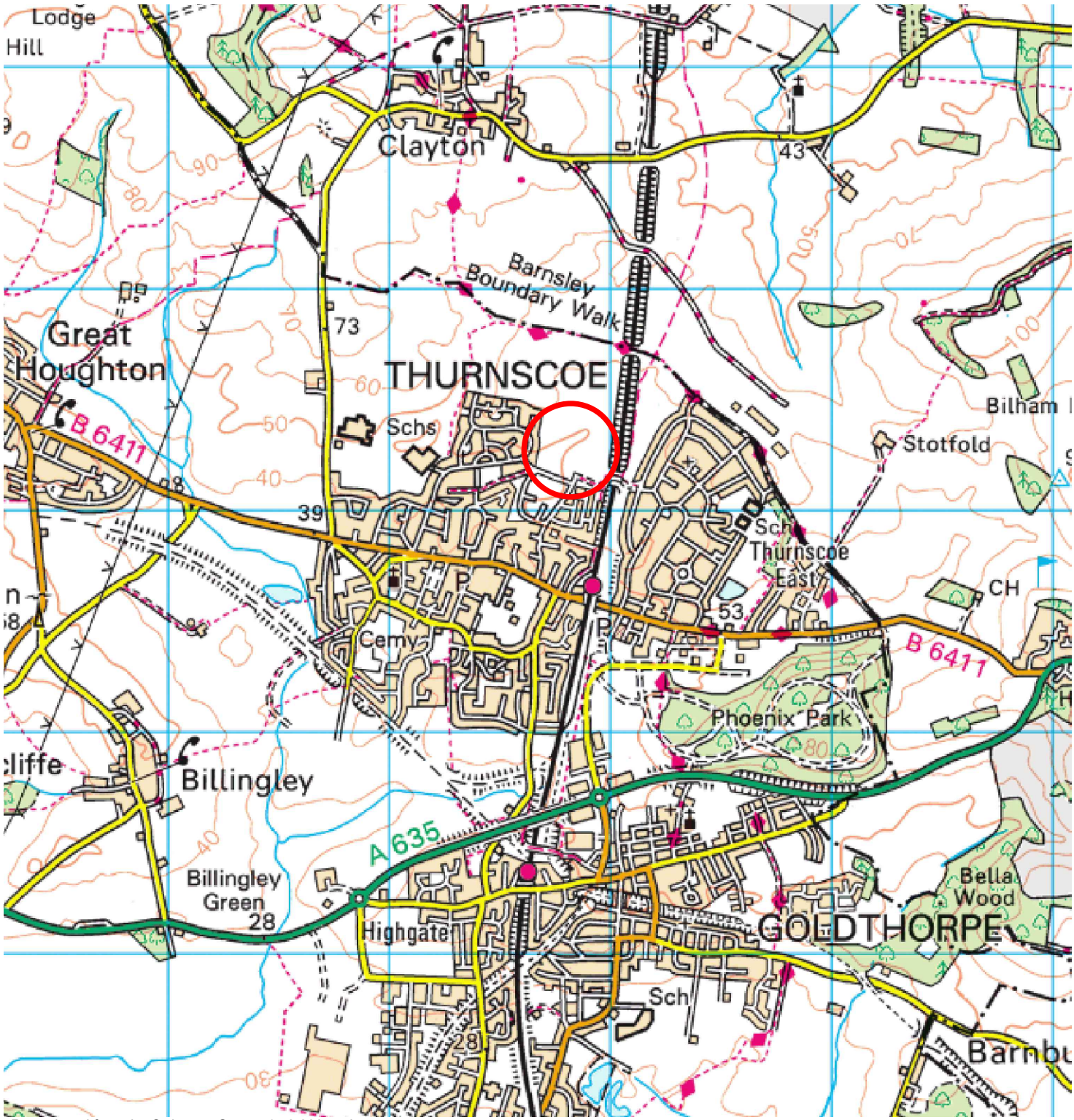
Any materials removed from site should be undertaken in accordance with current Duty of Care requirements and the Environment Agency Technical Guidance Document WM3, dated 2015. The waste may also be subject to Waste Acceptance Criteria (WAC) testing. In light of the regulations it is recommended that discussion with landfill operators takes place at an early stage.

11. REGULATORY APPROVALS

The conclusions and recommendations presented above are considered reasonable based on the findings of the site investigation. However, these cannot be guaranteed to gain regulatory approval and, therefore, the report should be passed to the appropriate regulatory authorities and/or other relevant organisations for their comment and approval prior to undertaking any works on site.

APPENDIX A

DRAWINGS



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NOTES

○ Site Location

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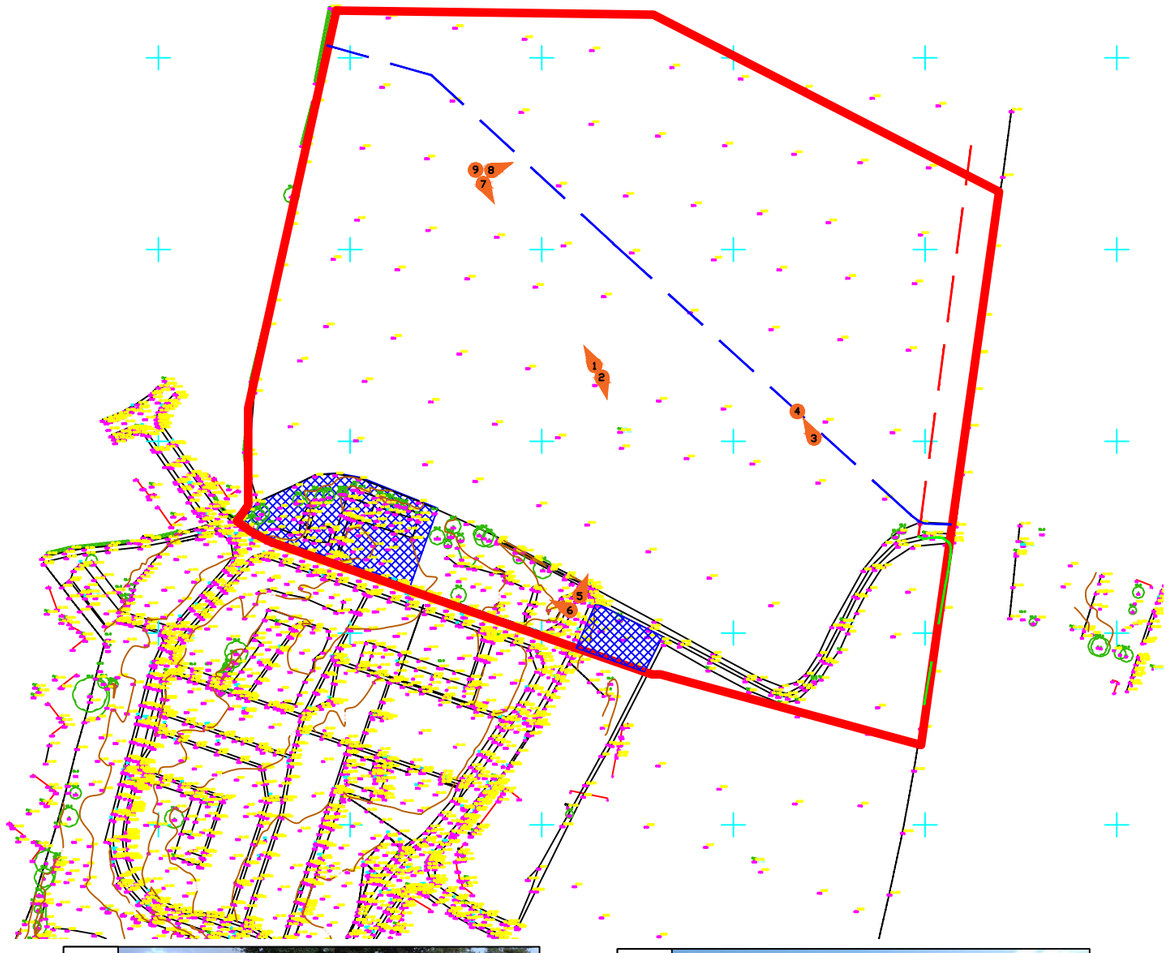
CLIENT	DRAWING NO.	REVISION NO.
Keepmoat Homes	C8023/01	0
SITE	DRAWN BY	APPROVED BY
Phase 3, School Street Thurnscoe	MF	RC
DRAWING TITLE	DATE	SCALE
Site Location Plan	November 2018	1:25,000

A4

Example of dried and cracked soils

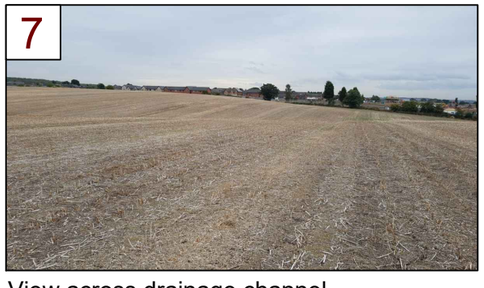
View northwest

View southeast



View along approximate line of water main

View northeast



View across drainage channel

View west into additional site area

View north from School Street to site access point

Open manhole and cover

NOTES

- Approximate Site Boundary
- Approximate location of overhead electricity cables
- Approximate location of water main
- Approximate location of below ground electricity cables
- Inaccessible during site investigation

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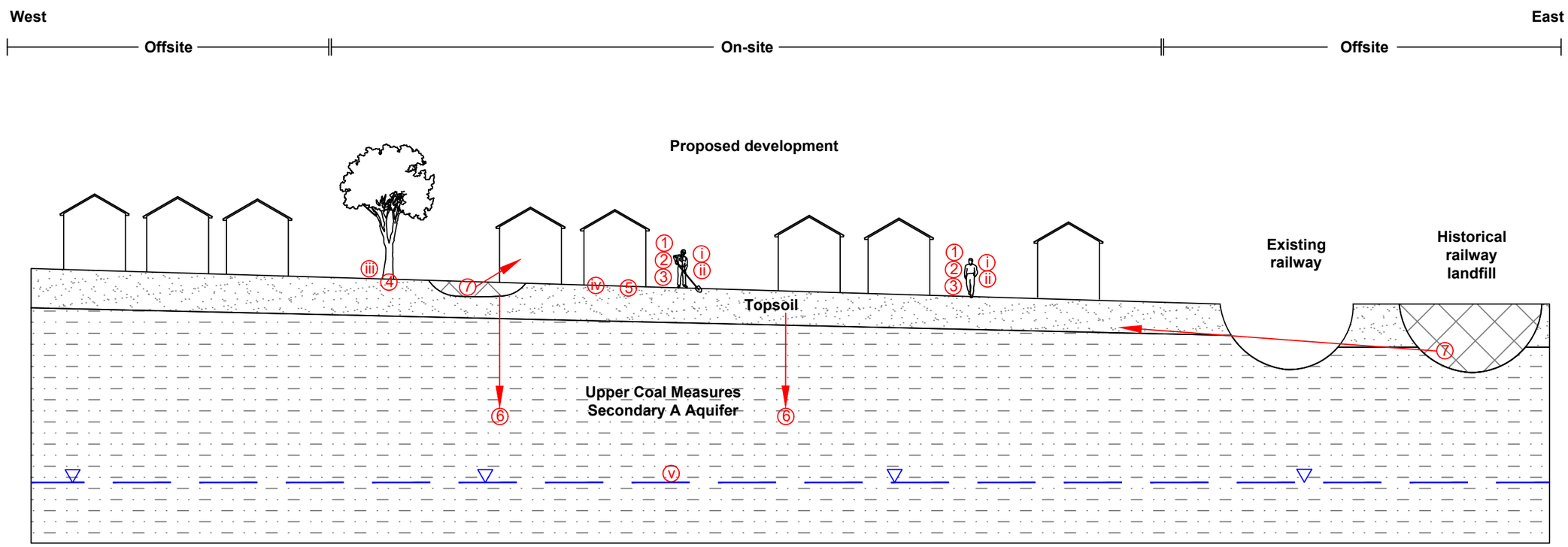
SITE

Phase 3, School Street, Thurnscoe

DRAWING TITLE

Site Features Plan

DRAWING NO.	REVISION NO.
C8023/02	0
DRAWN BY	APPROVED BY
MF	GH
DATE	SCALE	PAPER SIZE
November 2018	NTS	A3



Contamination Source	Contamination Pathway	Potential Receptors	Risk of Significant Contamination Linkage
Metals, metalloids, inorganic compounds, pesticides, asbestos (inhalation only), and hydrocarbons (including PAH's) may be present within topsoil, localised made ground and / or shallow soils at the site.	1) Direct and Indirect ingestion 2) Inhalation of contaminated particles and dust 3) Dermal contact	i. Construction and maintenance workers. ii. Site end users and adjacent land users	Moderate
	4) Plant Uptake	iii. Areas of private gardens and soft landscaping	Low to Moderate
Sulphates and organic contaminants which may be present in topsoil, localised made ground and / or shallow soils at the site.	5) Sulphate Attack	iv. Built environment	Low to Moderate
Possible leachable (and mobile) of metals, and metalloids, other inorganic and/or organic contaminates in perched/shallow groundwater.	6) Leaching and migration via groundwater flow	v. Underlying Secondary A Aquifer and on and off-site surface watercourses	Low to Moderate
Hazardous permanent ground gases resulting from areas of potential made ground on and offsite.	7) Gas migration	i. Construction and maintenance workers. ii. Site end users and adjacent land users iv. Built environment	Moderate

NOTES

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SITE

School Street, Phase 3, Thurnscoe

DRAWING TITLE

Preliminary Conceptual Site Model

DRAWING NO.	REVISION NO.
C8023/03	0
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RC	GH
DATE	SCALE	PAPER SIZE
November 2018	NTS	A3

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TP21 TP22 TP33 WS01 TP27 TP26 TP25 TP24 TP23 TP34 SA03 WS06 WS02 TP28 TP29 WS05 TP32 TP30 TP10 TP11 TP12 TP13 TP35 TP14 TP15 SA04 TP16 WS03 TP20 SA02A SA02 TP19 WS04 TP18 TP17 WS07 TP31 TP01 TP02 TP03 TP04 TP05 TP06 SA01 TP09 HP01 WS08 TP07 TP08 HP02 HP03 TP36 HP05 HP04

NOTES

- Approximate Site Boundary
- Trial Pit Location
- Window Sample Borehole Location with Gas and Groundwater Monitoring Installation
- Soakaway Infiltration Test Location
- Hand Dug Pit Location

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SITE

**School Street, Phase 3
Thurnscoe**

DRAWING TITLE

Exploratory Hole Location Plan

DRAWING NO.	REVISION NO.
C8023/04	0

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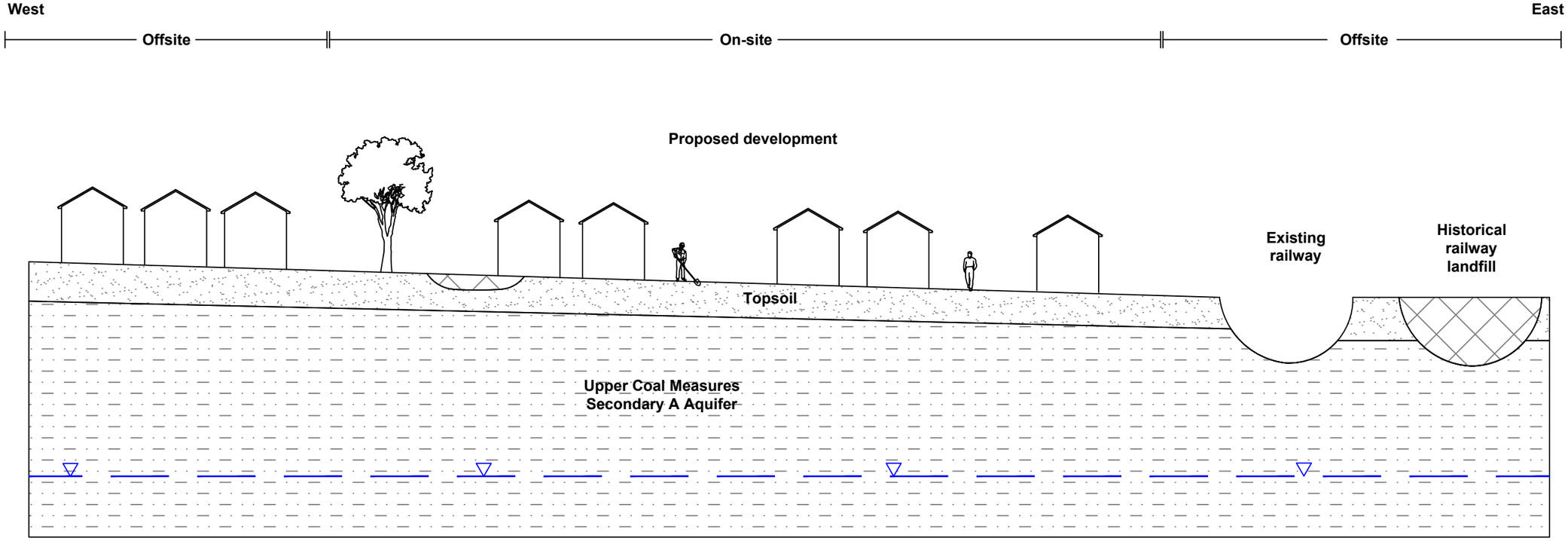
RC	GH

DATE	SCALE	PAPER SIZE
November 2018	1:1,000	A2



The revised CSM has not identified any residual contaminant linkages that could result in an unacceptable risk in the proposed end use. An assessment of the risk posed to the proposed development from hazardous ground gases is yet to be finalised following completion of the ground gas monitoring programme.

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SITE

School Street, Phase 3, Thurnscoe

DRAWING TITLE

Revised Conceptual Site Model

DRAWING NO.	REVISION NO.
C8023/05	0
DRAWN BY: RC	APPROVED BY: GH
DATE: November 2018	SCALE: NTS	PAPER SIZE: A3

PHASE 3 - APPRAISAL ACCOMMODATION SCHEDULE				
PRIVATE SALES UNITS			**No.**	**%**
House Type				
A	Detached	2 bed. 4 person	4	2
B	Detached and Semi-detached	2 bed. 3 person	10	4
C	Semi-detached and terrace	2 bed. 4 person	116	47
D	Detached	3 bed. 5 person	15	6
E	Detached and Semi-detached	3 bed. 5 person	19	8
F	Detached and Semi-detached	3 bed. 6 person	79	32
K	Semi-detached	3 bed. 5 person	4	2
		SUB-TOTAL	**247**	**100**
AFFORDABLE UNITS			**No.**	**%**
House Type				
G 740	Semi-detached	2 bed. 4 person	44	69
H 953	Semi-detached	3 bed. 5 person	20	31
		SUB-TOTAL	**64**	**100**
		TOTAL	**311**	

1:1000 DRAWING SCALE BAR (m)

0 10 20 30 40 50 60 70 80 90 100

GENERAL NOTES:

- This drawing is based on Haycock & Todd Topographical Survey, dated April 2013, job number 57847.
- REFER TO PLANNING LAYOUT DRAWING FOR ENLARGED DETAIL OF PHASE 2.

REVISION

A	MB	11.10.16	Scheme redesigned to relocate POS and reduce number of units.
B	MB	12.10.16	Road fronting 49-52 changed to private drive. Brick boundary walls removed.
C	MB	19.07.17	Phase 3 sketch layout added.

DRAWING TITLE:
CONTEXT PLAN - PHASES 2 & 3

PROJECT:
Residential Development

PROJECT ADDRESS:
School Street,
Thurnscoe

CLIENT:
KEEPMOAT HOMES

DRAWN	SCALE	DATE
MB	1:1000 @ A1	23rd SEP. 2016

JOB NO.	DWG. NO.	REVISION
2238	06	C

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Keepmoat
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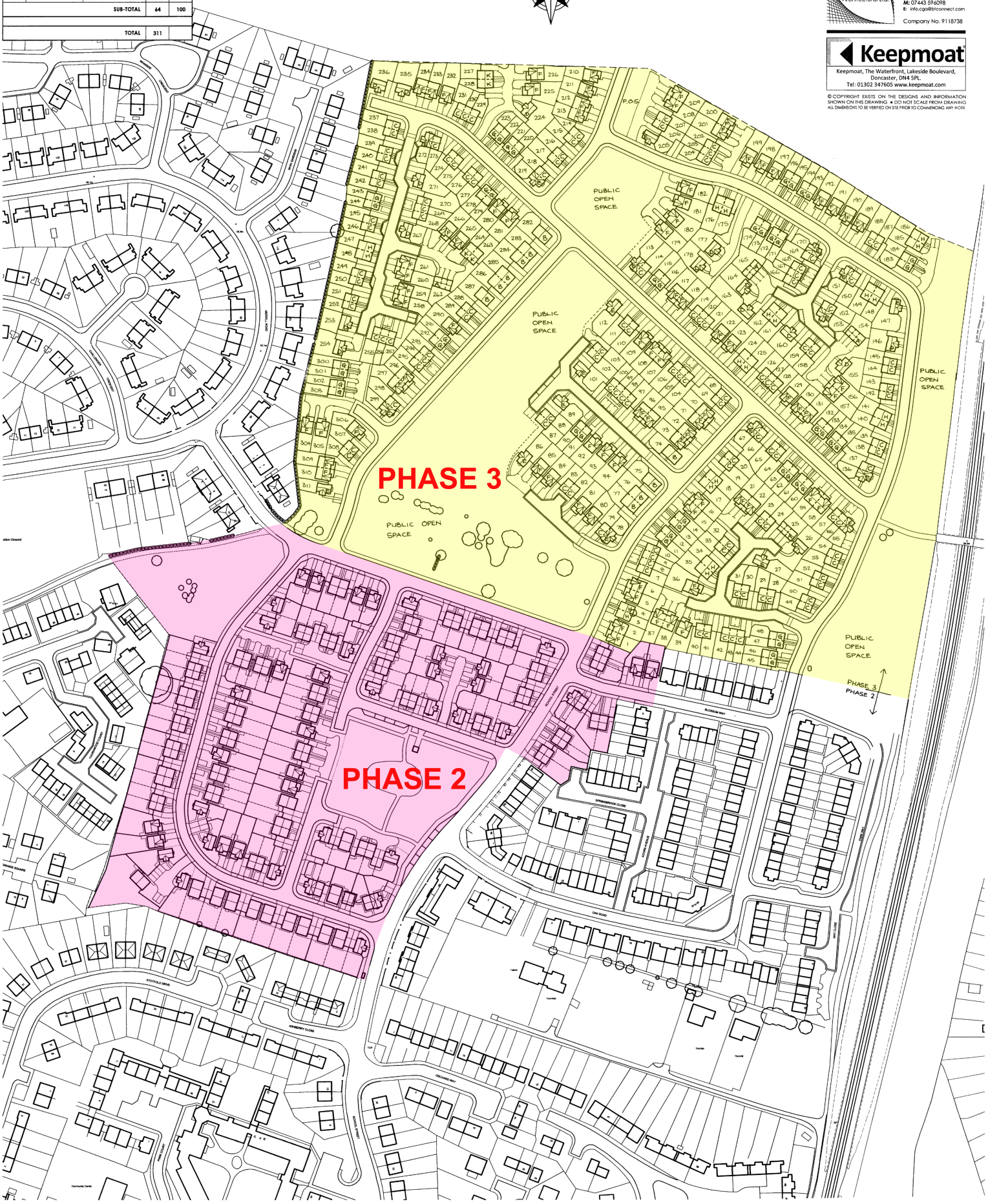

APPENDIX B

ENVIROCHECK REPORT

Envirocheck® Report:

Datasheet

Order Details:

Order Number:
178227804_1_1

Customer Reference:
C8023

National Grid Reference:
445840, 406240

Slice:
A

Site Area (Ha):
10.93

Search Buffer (m):
1000

Site Details:

Phase 3
Thurnscoe
ROTHERHAM
S63 0PQ

Client Details:

S Howson
Sirius Geotechnical Ltd
4245 Park Approach
Thorpe Park
Leeds
LS15 8GB

Contents

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 the attached 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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Report Version v53.0

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	Yes	n/a
Contaminated Land Register Entries and Notices					
Discharge Consents	pg 2				6
Prosecutions Relating to Controlled Waters			n/a	n/a	n/a
Enforcement and Prohibition Notices					
Integrated Pollution Controls	pg 3				1
Integrated Pollution Prevention And Control					
Local Authority Integrated Pollution Prevention And Control					
Local Authority Pollution Prevention and Controls	pg 3				3
Local Authority Pollution Prevention and Control Enforcements					
Nearest Surface Water Feature	pg 4	Yes			
Pollution Incidents to Controlled Waters	pg 4				2
Prosecutions Relating to Authorised Processes					
Registered Radioactive Substances					
River Quality	pg 4				1
River Quality Biology Sampling Points					
River Quality Chemistry Sampling Points					
Substantiated Pollution Incident Register	pg 4		1		1
Water Abstractions	pg 4				(*4)
Water Industry Act Referrals					
Groundwater Vulnerability	pg 5	Yes	n/a	n/a	n/a
Drift Deposits			n/a	n/a	n/a
Bedrock Aquifer Designations	pg 5	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 6	4	2	6	37

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 12				1
Historical Landfill Sites	pg 12		1	1	1
Integrated Pollution Control Registered Waste Sites					
Licensed Waste Management Facilities (Landfill Boundaries)					
Licensed Waste Management Facilities (Locations)	pg 12				1
Local Authority Landfill Coverage	pg 12	1	n/a	n/a	n/a
Local Authority Recorded Landfill Sites	pg 13		1	2	2
Registered Landfill Sites	pg 14		1		1
Registered Waste Transfer Sites					
Registered Waste Treatment or Disposal Sites					
Hazardous Substances					
Control of Major Accident Hazards Sites (COMAH)					
Explosive Sites					
Notification of Installations Handling Hazardous Substances (NIHHS)					
Planning Hazardous Substance Consents					
Planning Hazardous Substance Enforcements					
Geological					
BGS 1:625,000 Solid Geology	pg 15	Yes	n/a	n/a	n/a
BGS Recorded Mineral Sites	pg 15			1	6
CBSCB Compensation District			n/a	n/a	n/a
Coal Mining Affected Areas	pg 16	Yes	n/a	n/a	n/a
Mining Instability	pg 16	Yes	n/a	n/a	n/a
Man-Made Mining Cavities					
Natural Cavities					
Non Coal Mining Areas of Great Britain				n/a	n/a
Potential for Collapsible Ground Stability Hazards	pg 16	Yes		n/a	n/a
Potential for Compressible Ground Stability Hazards	pg 16		Yes	n/a	n/a
Potential for Ground Dissolution Stability Hazards				n/a	n/a
Potential for Landslide Ground Stability Hazards	pg 16	Yes		n/a	n/a
Potential for Running Sand Ground Stability Hazards	pg 16		Yes	n/a	n/a
Potential for Shrinking or Swelling Clay Ground Stability Hazards	pg 16	Yes		n/a	n/a
Radon Potential - Radon Affected Areas	pg 17	Yes	n/a	n/a	n/a
Radon Potential - Radon Protection Measures			n/a	n/a	n/a

Summary

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Industrial Land Use					
Contemporary Trade Directory Entries	pg 18		4	9	53
Fuel Station Entries	pg 23				1
Gas Pipelines					
Underground Electrical Cables					
Sensitive Land Use					
Ancient Woodland					
Areas of Adopted Green Belt	pg 24	1		1	
Areas of Unadopted Green Belt					
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	pg 24	1		1	
Ramsar Sites					
Sites of Special Scientific Interest					
Special Areas of Conservation					
Special Protection Areas					
World Heritage Sites					

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A13NE (SW)	0	1	445840 406242
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A13NW (NW)	0	1	445750 406300
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A13NW (W)	0	1	445800 406242
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A13NE (N)	0	1	445840 406250
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A13SW (S)	1	1	445800 406100
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A13SE (E)	28	1	446050 406200
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding to Occur at Surface	A13NE (E)	67	1	446100 406242
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A13SE (S)	108	1	445950 405950
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding to Occur at Surface	A13NE (E)	115	1	446150 406300
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A13NE (E)	120	1	446150 406350
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A18SW (NW)	223	1	445550 406600
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A14NW (NE)	254	1	446250 406450
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A8NE (S)	258	1	445900 405800
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A8NE (S)	273	1	445840 405800
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A14NW (NE)	283	1	446250 406500
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A8NE (SE)	343	1	446150 405750
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A14NW (NE)	354	1	446300 406550
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A14SW (SE)	367	1	446350 405950
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A19SW (NE)	495	1	446400 406650

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
1	**Discharge Consents** Operator: British Coal Corporation Property Type: MINING OF COAL + LIGNITE Location: Hickleton Colliery (Ncb) Outlet No., 1-Yard Drainage Interceptor Authority: Environment Agency, North East Region Catchment Area: Don Tributaries Reference: 3516 Permit Version: 1 Effective Date: 12th September 1983 Issued Date: 12th September 1983 Revocation Date: 1st March 1991 Discharge Type: Trade Effluent Discharge Environment: Freshwater Stream/River Receiving Water: Not Supplied **Status: Authorisation revoked** Positional Accuracy: Located by supplier to within 100m	A4NW (SE)	909	2	446300 405200
2	**Discharge Consents** Operator: British Coal Corporation Property Type: MINING OF COAL + LIGNITE Location: Hickleton Colliery (Ncb) Outlet No., 6-New Outlet Authority: Environment Agency, North East Region Catchment Area: Don Tributaries Reference: 3168 Permit Version: 1 Effective Date: 12th September 1983 Issued Date: 12th September 1983 Revocation Date: 1st March 1991 Discharge Type: Trade Effluent Discharge Environment: Freshwater Stream/River Receiving Water: Not Supplied **Status: Authorisation revoked** Positional Accuracy: Located by supplier to within 100m	A4NW (SE)	947	2	446400 405200
3	**Discharge Consents** Operator: Doncaster M.B.C. Property Type: WASTE COLLECTION/TREATMENT/DISPOSAL/MATERIALS RECOVERY Location: Chapel Lane Landfill Adjacent To Chapel Lane, Thurnscoe, Barnsley, South Yorkshire Authority: Environment Agency, North East Region Catchment Area: Don Tributaries Reference: C5092 Permit Version: 1 Effective Date: 17th June 1988 Issued Date: 17th June 1988 Revocation Date: 14th March 2007 Discharge Type: Trade Effluent Discharge Environment: Freshwater Stream/River Receiving Water: Tributary Of Frickley Beck **Status: Revoked (Water Resources Act 1991, Section 88 & Schedule 10 as amended by Environment Act 1995)** Positional Accuracy: Located by supplier to within 100m	A19NE (NE)	961	2	446720 406990
4	**Discharge Consents** Operator: Yorkshire Forward Property Type: MINING OF COAL + LIGNITE Location: Hickleton Former Colliery Site, Thurnscoe, South Yorkshire, England Authority: Environment Agency, North East Region Catchment Area: Don Tributaries Reference: Wra7499 Permit Version: 1 Effective Date: 16th March 1999 Issued Date: 16th March 1999 Revocation Date: 31st December 1999 Discharge Type: Trade Discharges - Site Drainage Discharge Environment: Freshwater Stream/River Receiving Water: Thurnscoe Dyke **Status: New Consent (Water Resources Act 1991, Section 88 & Schedule 10 as amended by Environment Act 1995)** Positional Accuracy: Located by supplier to within 10m	A4NW (SE)	991	2	446350 405131

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
4	**Discharge Consents** Operator: Yorkshire Forward Property Type: MINING OF COAL + LIGNITE Location: Hickleton Former Colliery Site, Thurnscoe, South Yorkshire, England Authority: Environment Agency, North East Region Catchment Area: Don Tributaries Reference: Wra7499 Permit Version: 1 Effective Date: 16th March 1999 Issued Date: 16th March 1999 Revocation Date: 31st December 1999 Discharge Type: Trade Discharges - Site Drainage Discharge Environment: Ditch Receiving Water: Thurnscoe Dyke **Status: New Consent (Water Resources Act 1991, Section 88 & Schedule 10 as amended by Environment Act 1995)** Positional Accuracy: Located by supplier to within 10m	A4NW (SE)	992	2	446350 405130
4	**Discharge Consents** Operator: Yorkshire Forward Property Type: MINING OF COAL + LIGNITE Location: Hickleton Former Colliery Site, Thurnscoe, South Yorkshire, England Authority: Environment Agency, North East Region Catchment Area: Don Tributaries Reference: Wra7499 Permit Version: 2 Effective Date: 1st January 2000 Issued Date: 16th March 1999 Revocation Date: 23rd September 2003 Discharge Type: Trade Discharges - Site Drainage Discharge Environment: Ditch Receiving Water: Thurnscoe Dyke **Status: Revoked (Water Resources Act 1991, Section 88 & Schedule 10 as amended by Environment Act 1995)** Positional Accuracy: Located by supplier to within 10m	A4NW (SE)	992	2	446350 405130
5	**Integrated Pollution Controls** Name: Hanley Swiffen & Co Ltd Location: 107 High Street, Thurnscoe, ROTHERHAM, South Yorkshire, S63 0QZ Authority: Environment Agency, North East Region Permit Reference: AI4689 Dated: 5th April 1993 Process Type: Application since found to be exempt from IPC Description: 2.2 A (C) Non-ferrous Metal processes within the Metal Industry **Status: Application since found to be exempt from IPC** Positional Accuracy: Unknown	A7SW (SW)	867	2	445039 405536
6	**Local Authority Pollution Prevention and Controls** Name: Larratt Pepper & Sons Ltd Location: 6 Clayton Lane, Thrunscoe, ROTHERHAM, South Yorks, S63 0RU Authority: Barnsley Metropolitan Borough Council, Environmental Health and Trading Standards Permit Reference: Epa70 Dated: Not Supplied Process Type: Local Authority Air Pollution Control Description: PG1/1Waste oil burners, less than 0.4MW net rated thermal input **Status: Authorisation revoked** Positional Accuracy: Automatically positioned to the address	A11SE (W)	898	3	444777 405910
7	**Local Authority Pollution Prevention and Controls** Name: Lidgett Concrete Co Ltd Location: Plot 6, Albion Drive, Thurnscoe, ROTHERHAM, South Yorks, S63 0BA Authority: Barnsley Metropolitan Borough Council, Environmental Health and Trading Standards Permit Reference: Ppc/B/20 Dated: 19th April 1994 Process Type: Local Authority Pollution Prevention and Control Description: PG3/1Blending, packing, loading and use of bulk cement **Status: Permitted** Positional Accuracy: Located by supplier to within 10m	A10NW (SE)	978	3	446861 405596
8	**Local Authority Pollution Prevention and Controls** Name: English Partnerships Location: Former Hickleton Colliery, Lidget Lane, Thurnscoe, Rotherham Authority: Barnsley Metropolitan Borough Council, Environmental Health and Trading Standards Permit Reference: Epa96 Dated: Not Supplied Process Type: Local Authority Air Pollution Control Description: PG3/5 Coal, coke and coal product processes **Status: Authorisation revoked** Positional Accuracy: Manually positioned to the road within the address or location	A9SE (SE)	987	3	446760 405429

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Nearest Surface Water Feature	A13NW (N)	0	-	445825 406362
9	**Pollution Incidents to Controlled Waters** Property Type: Water Company Sewage: Storm Overflow Location: Walbert Avenue, Thurnscoe, ROTHERHAM Authority: Environment Agency, North East Region Pollutant: Unknown Sewage Note: No Fish Killed Incident Date: 21st September 1995 Incident Reference: SH950004 Catchment Area: Dearne Tributaries Receiving Water: Freshwater Stream/River Cause of Incident: Not Given Incident Severity: Category 1 - Major Incident Positional Accuracy: Located by supplier to within 100m	A8SW (S)	855	2	445500 405300
10	**Pollution Incidents to Controlled Waters** Property Type: Other General Premises Location: THURNSCOE Authority: Environment Agency, North East Region Pollutant: Oils - Waste Oil Note: No Fish Killed Incident Date: 21st August 1997 Incident Reference: SH970396 Catchment Area: Dearne Tributaries Receiving Water: Freshwater Stream/River Cause of Incident: Not Given Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A7SE (SW)	965	2	445200 405300
	River Quality Name: Ings/Carr/Thurnscoe_Dikes GQA Grade: River Quality C Reach: Hickleton_Main_Colli_Houghton_Bec Estimated Distance (km): 2.6 Flow Rate: Flow less than 0.31 cumecs Flow Type: River Year: 2000	A4NW (S)	914	2	446225 405168
11	**Substantiated Pollution Incident Register** Authority: Environment Agency - North East Region, Yorkshire Area Incident Date: 12th February 2003 Incident Reference: 136628 Water Impact: Category 4 - No Impact Air Impact: Category 4 - No Impact Land Impact: Category 2 - Significant Incident Positional Accuracy: Located by supplier to within 10m Pollutant: Specific Waste Materials: Vehicles And Vehicle Parts	A14SW (SE)	187	2	446189 406060
12	**Substantiated Pollution Incident Register** Authority: Environment Agency - North East Region, Yorkshire Area Incident Date: 22nd July 2013 Incident Reference: 1137194 Water Impact: Category 2 - Significant Incident Air Impact: Category 4 - No Impact Land Impact: Category 4 - No Impact Positional Accuracy: Located by supplier to within 10m Pollutant: Other Pollutant	A9NE (SE)	660	2	446524 405657
	Water Abstractions Operator: C H Scholey & Sons Ltd Licence Number: 2/27/09/095 Permit Version: 101 Location: Borehole - Coal Measures - Frickley Lodge Authority: Environment Agency, North East Region Abstraction: General Farming And Domestic Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): 23 Yearly Rate (m3): 4546 Details: Frickley Lodge Farm, Nr. Doncaster Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 1st April 2008 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	A25SW (NE)	1593	2	447100 407500

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Water Abstractions Operator: Hickleton Golf Club Licence Number: 2/27/08/113 Permit Version: 100 Location: Borehole - Coal Measures - Hickleton Doncaster Authority: Environment Agency, North East Region Abstraction: Golf Courses: Spray Irrigation - Direct Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): 47 Yearly Rate (m3): 7954 Details: Hickleton Golf Club, Lidgett Lane, Hickleton, Doncaster Authorised Start: 01 April Authorised End: 31 October Permit Start Date: 20th June 1996 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	(E)	1665	2	447600 405600
	Water Abstractions Operator: Hickleton Golf Club Licence Number: 2/27/08/139/R01 Permit Version: 1 Location: Borehole-Coal Measures-Hickleton-Doncaster Authority: Environment Agency, North East Region Abstraction: Golf Courses: Spray Irrigation - Direct Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Hickleton Golf Club, Lidgett Lane, Hickleton, Doncaster Authorised Start: 01 April Authorised End: 31 October Permit Start Date: 1st April 2017 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	(E)	1693	2	447632 405610
	Water Abstractions Operator: Hickleton Golf Club Licence Number: 2/27/08/139 Permit Version: 1 Location: Borehole-Coal Measures-Hickleton-Doncaster Authority: Environment Agency, North East Region Abstraction: Golf Courses: Spray Irrigation - Direct Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Hickleton Golf Club, Lidgett Lane, Hickleton, Doncaster Authorised Start: 01 April Authorised End: 31 October Permit Start Date: 1st January 2006 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	(E)	1693	2	447632 405610
	Groundwater Vulnerability Soil Classification: Soils of High Leaching Potential (U) - Soil information for restored mineral workings and urban areas is based on fewer observations than elsewhere. A worst case vulnerability classification (H) assumed, until proved otherwise Map Sheet: Sheet 12 Vale of York Scale: 1:100,000	A13SW (SW)	0	2	445800 406185
	Groundwater Vulnerability Soil Classification: Soils of Low Leaching Potential - Soils in which pollutants are unlikely to penetrate the soil layer because water movement is largely horizontal or they have large ability to attenuate diffuse pollutants. Lateral flow from these soils contribute to groundwater recharge elsewhere in the catchment Map Sheet: Sheet 12 Vale of York Scale: 1:100,000	A13NE (SW)	0	2	445840 406242
	Drift Deposits None				
	Bedrock Aquifer Designations Aquifer Designation: Secondary Aquifer - A	A13NE (SW)	0	1	445840 406242
	Superficial Aquifer Designations No Data Available				
	Extreme Flooding from Rivers or Sea without Defences None				
	Flooding from Rivers or Sea without Defences None				

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Areas Benefiting from Flood Defences None				
	Flood Water Storage Areas None				
	Flood Defences None				
13	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 174.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A13NW (NW)	0	4	445800 406292
14	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 159.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A13NW (N)	0	4	445833 406300
15	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 130.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A13NW (NW)	0	4	445800 406292
16	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 891.3 Watercourse Level: Not Supplied Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A13SW (W)	0	4	445678 406179
17	**OS Water Network Lines** Watercourse Form: Lake Watercourse Length: 4.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A13NE (NE)	1	4	445912 406388
18	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 4.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A13NE (NE)	31	4	446059 406335
19	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 3.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A8NE (S)	324	4	445994 405733
20	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 12.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A8NE (S)	327	4	445955 405733

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
21	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 8.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A8NE (S)	331	4	445964 405728
22	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 12.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A8NE (S)	339	4	445959 405721
23	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 868.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A12NE (W)	379	4	445263 406373
24	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 620.1 Watercourse Level: Not Supplied Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A12NE (W)	422	4	445225 406242
25	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 148.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A18NW (N)	621	4	445797 407045
26	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 95.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A12SW (W)	662	4	444979 406121
27	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 4.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A17NE (NW)	663	4	445334 406985
28	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 591.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A17NE (NW)	667	4	445330 406988
29	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 413.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A17NE (NW)	667	4	445330 406988

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
30	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 322.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A12SW (W)	694	4	444958 406030
31	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 58.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A18NW (N)	731	4	445806 407155
32	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 170.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A8SW (S)	747	4	445598 405381
33	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 253.9 Watercourse Level: Not Supplied Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A7SE (SW)	751	4	445489 405414
34	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 1.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A14NE (E)	771	4	446791 406467
35	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 99.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A14NE (E)	772	4	446791 406468
36	**OS Water Network Lines** Watercourse Form: Lake Watercourse Length: 2.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A18NE (N)	783	4	446076 407171
37	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 2.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A18NE (N)	786	4	446076 407174
38	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 284.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A18NE (N)	786	4	446076 407176

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
39	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 237.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A18NE (N)	788	4	446076 407176
40	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 329.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A18NW (N)	789	4	445800 407213
41	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 109.9 Watercourse Level: Not Supplied Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A14NE (E)	829	4	446826 406561
42	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 8.2 Watercourse Level: Not Supplied Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A7NW (SW)	849	4	444927 405698
43	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 150.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A7NW (SW)	857	4	444921 405693
44	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 426.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Thurnsoe Dike Catchment Name: Don and Rother Primacy: 1	A3NE (S)	865	4	446063 405195
45	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 891.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A19SE (NE)	876	4	446833 406677
46	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 204.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A19SE (NE)	878	4	446837 406671
47	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 464.2 Watercourse Level: Underground Permanent: True Watercourse Name: Thurnsoe Dike Catchment Name: Don and Rother Primacy: 1	A3NE (S)	883	4	446024 405175

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
48	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 14.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A11SE (W)	898	4	444742 406176
49	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 14.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A17NE (NW)	918	4	445192 407198
50	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 152.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A7SE (SW)	931	4	445258 405308
51	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 164.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A15NW (E)	936	4	446951 406508
52	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 20.9 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A24SW (N)	942	4	446245 407276
53	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 49.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A3NE (S)	951	4	446135 405117
54	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 325.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A3NE (S)	954	4	446145 405114
55	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 172.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A24SW (N)	959	4	446264 407285
56	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 254.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A6NE (W)	967	4	444721 405858

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
57	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 454.9 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A3NE (S)	968	4	446102 405095
58	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 126.0 Watercourse Level: Not Supplied Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A3NE (S)	968	4	446102 405095
59	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 45.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A11SE (W)	983	4	444660 406077
60	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 472.9 Watercourse Level: Not Supplied Permanent: True Watercourse Name: Thurnsoe Dike Catchment Name: Don and Rother Primacy: 1	A4NW (SE)	994	4	446462 405177
61	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 437.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Don and Rother Primacy: 1	A4NW (SE)	996	4	446443 405166

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
62	**BGS Recorded Landfill Sites** Site Name: Brickworks Quarry Location: Thurnscoe, NR DEARNE, South Yorks Authority: British Geological Survey, National Geoscience Information Service Ground Water: Information not available Surface Water: Information not available Geology: N/A Positional Accuracy: Positioned by the supplier Boundary Accuracy: Good	A9NE (SE)	628	-	446589 405820
63	**Historical Landfill Sites** Licence Holder: Barnsley Metropolitan Borough Council Location: Chapel Lane, Thurnscoe, Barnsley Name: Former Railway Cutting Operator Location: Not Supplied Boundary Accuracy: As Supplied Provider Reference: EAHLD04415 First Input Date: 31st July 1978 Last Input Date: 31st July 1982 Specified Waste Type: Deposited Waste included Inert, Industrial, Commercial, Household and Special Waste, and Liquid Sludge EA Waste Ref: 0 Regis Ref: Not Supplied WRC Ref: 4400/0412 BGS Ref: Not Supplied Other Ref: WD20 B196, WD2 B7, WD2 T3, 20B196(9), 4400/0359, 4400/(65), 4400/2D11	A13SE (E)	43	2	446065 406163
64	**Historical Landfill Sites** Licence Holder: Barnsley Metropolitan Borough Council Location: Chapel Lane, Thurnscoe, Barnsley Name: Railway Cutting Operator Location: Not Supplied Boundary Accuracy: As Supplied Provider Reference: EAHLD04416 First Input Date: 1st July 1978 Last Input Date: 31st July 1982 Specified Waste Type: Deposited Waste included Inert, Industrial, Commercial and Household Waste, and Liquid Sludge EA Waste Ref: 0 Regis Ref: Not Supplied WRC Ref: 4400/0359 BGS Ref: Not Supplied Other Ref: 2D11(65), 4400/2D11, 80/22/1582, WD2 B7, WD2 B196, WD2 D11, 4400/(65), 4400/2D11	A14NW (NE)	355	2	446304 406547
65	**Historical Landfill Sites** Licence Holder: National Coal Board/Deane Urban District Council Location: Thurnscoe, Near Dearne, South Yorkshire Name: Brickworks Quarry Operator Location: Not Supplied Boundary Accuracy: As Supplied Provider Reference: EAHLD04417 First Input Date: 31st December 1950 Last Input Date: 31st December 1980 Specified Waste Type: Deposited Waste included Household Waste EA Waste Ref: 0 Regis Ref: Not Supplied WRC Ref: 4400/0539 BGS Ref: 87 Other Ref: 4400/(137), (137)B	A9NE (SE)	628	2	446583 405813
66	**Licensed Waste Management Facilities (Locations)** Licence Number: 65316 Location: 84 High Street , Thurnscoe, Rotherham, South Yorkshire, S63 0QH Operator Name: Mrs Stephanie Anne Speight Operator Location: Not Supplied Authority: Environment Agency - North East Region, Yorkshire Area Site Category: End of Life Vehicles **Licence Status: Surrendered** Issued: 11th August 2004 Last Modified: Not Supplied Expires: Not Supplied Suspended: Not Supplied Revoked: Not Supplied Surrendered: 15th July 2005 IPPC Reference: Not Supplied Positional Accuracy: Located by supplier to within 10m	A7SE (SW)	768	2	445267 405488
	Local Authority Landfill Coverage Name: Barnsley Metropolitan Borough Council - Has supplied landfill data		0	3	445840 406242

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Local Authority Landfill Coverage Name: Doncaster Metropolitan Borough Council - Has supplied landfill data		336	5	445966 406739
67	**Local Authority Recorded Landfill Sites** Location: Not Supplied Reference: 9 Authority: Barnsley Metropolitan Borough Council, Environmental Health and Trading Standards **Last Reported Status:** **Unknown** Types of Waste: Not Supplied Date of Closure: Not Supplied Positional Accuracy: Positioned by the supplier Boundary Quality: Moderate	A13SE (E)	51	3	446070 406149
68	**Local Authority Recorded Landfill Sites** Location: Not Supplied Reference: 9 Authority: Barnsley Metropolitan Borough Council, Environmental Health and Trading Standards **Last Reported Status:** **Unknown** Types of Waste: Not Supplied Date of Closure: Not Supplied Positional Accuracy: Positioned by the supplier Boundary Quality: Moderate	A14NW (NE)	368	3	446313 406557
69	**Local Authority Recorded Landfill Sites** Location: Chapel Lane, Thurnscoe Reference: 65 Authority: Doncaster Metropolitan Borough Council, Environmental Services **Last Reported Status:** **Unknown** Types of Waste: Not Supplied Date of Closure: Not Supplied Positional Accuracy: Positioned by the supplier Boundary Quality: Good	A14NW (NE)	369	5	446313 406558
70	**Local Authority Recorded Landfill Sites** Location: Not Supplied Reference: 137 Authority: Barnsley Metropolitan Borough Council, Environmental Health and Trading Standards **Last Reported Status:** **Unknown** Types of Waste: Not Supplied Date of Closure: Not Supplied Positional Accuracy: Positioned by the supplier Boundary Quality: Moderate	A9NE (SE)	645	3	446615 405867
71	**Local Authority Recorded Landfill Sites** Location: Lidget Lane, Thurnscoe Reference: 102 Authority: Doncaster Metropolitan Borough Council, Environmental Services **Last Reported Status:** **Unknown** Types of Waste: Not Supplied Date of Closure: Not Supplied Positional Accuracy: Positioned by the supplier Boundary Quality: Moderate	A9SW (SE)	842	5	446253 405255

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
72	**Registered Landfill Sites** Licence Holder: Barnsley M.B.C. Licence Reference: WD 2 B 7 (WD20 B 196) Site Location: Chapel Lane (Ii), Thurnscoe, Rotherham, South Yorkshire Licence Easting: 446060 Licence Northing: 406090 Operator Location: Cleansing Div. Smithies La.Depot, Barnsley, South Yorkshire Authority: Environment Agency - North East Region, Ridings Area Site Category: Landfill - Railway cutting Max Input Rate: Large (Equal to or greater than 75,000 and less than 250,000 tonnes per year) Waste Source Restrictions: No known restriction on source of waste Status: Licence lapsed/cancelled/defunct/not applicable/surrenderedCancelled Dated: 1st February 1981 Preceded By Licence: Wd 2 D11 (Wd20 B196) Superseded By Licence: Not Given Positional Accuracy: Manually positioned to the address or location Boundary Accuracy: Not Applicable Authorised Waste: Construction Ind. Wastes Contaminated Rubbish/Bags/Sacks Empty Used Containers Household + Commercial Waste Ind. Non-Haz. Inert, Non-Flammable Ind. Non-Haz. Potentially Combustible Medical, Surgical, Veterinary Wastes Metal Scrap Old Cars/Vehicles/Trailers Scrap Rubber (Including Tyres) Sewage Sludge Slag, Boiler/Flue Cleanings Tar, Pitch, Bitumen, Asphalts Used Filter Materials $	A13SE (SE)	54	2	446060 406090
73	**Registered Landfill Sites** Licence Holder: Doncaster M.B.C. Licence Reference: WD 2 D11 (WD20 B196) Site Location: Chapel Lane (I), Thurnscoe, Rotherham, South Yorkshire Licence Easting: 446460 Licence Northing: 406660 Operator Location: Town Hall, Barnsley, South Yorkshire Authority: Environment Agency - North East Region, Ridings Area Site Category: Landfill - Railway cutting Max Input Rate: Medium (Equal to or greater than 25,000 and less than 75,000 tonnes per year) Waste Source Restrictions: No known restriction on source of waste Status: Licence lapsed/cancelled/defunct/not applicable/surrenderedCancelled Dated: 1st July 1978 Preceded By Licence: Not Given Superseded By Licence: Wd 2 B 7 (Wd20 B 196) Positional Accuracy: Manually positioned to the address or location Boundary Accuracy: Not Applicable Authorised Waste: Demolition Rubble Other Inert Waste Road Mat'Ls/Kerbs/Asphalt/Tarmac/Stone	A19SW (NE)	547	2	446460 406660

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS 1:625,000 Solid Geology Description: Pennine Upper Coal Measures Formation	A13NE (SW)	0	1	445840 406242
74	**BGS Recorded Mineral Sites** Site Name: Thurnscoe Location: Not Supplied Source: British Geological Survey, National Geoscience Information Service Reference: 37815 Type: Opencast **Status: Ceased** Operator: Not Supplied Operator Location: Not Supplied Periodic Type: Carboniferous Geology: Dalton Rock Commodity: Sandstone Positional Accuracy: Located by supplier to within 10m	A18SW (NW)	327	1	445579 406733
75	**BGS Recorded Mineral Sites** Site Name: Clayton Location: Not Supplied Source: British Geological Survey, National Geoscience Information Service Reference: 37814 Type: Opencast **Status: Ceased** Operator: Not Supplied Operator Location: Not Supplied Periodic Type: Carboniferous Geology: Dalton Rock Commodity: Sandstone Positional Accuracy: Located by supplier to within 10m	A18NW (N)	539	1	445677 406964
76	**BGS Recorded Mineral Sites** Site Name: Hickleton Brickworks Location: Not Supplied Source: British Geological Survey, National Geoscience Information Service Reference: 13104 Type: Opencast **Status: Ceased** Operator: Not Supplied Operator Location: Not Supplied Periodic Type: Carboniferous Geology: Pennine Upper Coal Measures Formation Commodity: Common Clay and Shale Positional Accuracy: Located by supplier to within 10m	A9NE (SE)	698	1	446620 405740
77	**BGS Recorded Mineral Sites** Site Name: Hickleton Main Colliery No. 2 Shaft Location: Not Supplied Source: British Geological Survey, National Geoscience Information Service Reference: 174784 Type: Underground **Status: Ceased** Operator: Not Supplied Operator Location: Not Supplied Periodic Type: Carboniferous Geology: Pennine Coal Measures Group Commodity: Coal - Deep Positional Accuracy: Located by supplier to within 10m	A9SW (SE)	825	1	446385 405328
78	**BGS Recorded Mineral Sites** Site Name: Hickleton Main Colliery No. 1 Shaft Location: Not Supplied Source: British Geological Survey, National Geoscience Information Service Reference: 13099 Type: Underground **Status: Ceased** Operator: Not Supplied Operator Location: Not Supplied Periodic Type: Carboniferous Geology: Pennine Upper Coal Measures Formation Commodity: Coal - Deep Positional Accuracy: Located by supplier to within 10m	A9SW (SE)	864	1	446458 405326

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
79	**BGS Recorded Mineral Sites** Site Name: Hickleton Colliery Methane Location: Not Supplied Source: British Geological Survey, National Geoscience Information Service Reference: 11414 Type: Liquid or Gas Extraction **Status: Dormant** Operator: Not Supplied Operator Location: Not Supplied Periodic Type: Carboniferous Geology: Pennine Coal Measures Group Commodity: Abandoned Mine Methane Positional Accuracy: Located by supplier to within 10m	A9SE (SE)	964	1	446547 405264
79	**BGS Recorded Mineral Sites** Site Name: Hickleton Main Colliery No. 3 Shaft Location: Not Supplied Source: British Geological Survey, National Geoscience Information Service Reference: 174785 Type: Underground **Status: Ceased** Operator: Not Supplied Operator Location: Not Supplied Periodic Type: Carboniferous Geology: Pennine Coal Measures Group Commodity: Coal - Deep Positional Accuracy: Located by supplier to within 10m	A4NE (SE)	985	1	446529 405227
	Coal Mining Affected Areas Description: In an area which may be affected by coal mining activity. It is recommended that a coal mining report is obtained from the Coal Authority. Contact details are included in the Useful Contacts section of this report.	A13NE (SW)	0	6	445840 406242
	Mining Instability Mining Evidence: Inconclusive Coal Mining Source: Ove Arup & Partners Boundary Quality: As Supplied	A13NE (SW)	0	-	445840 406242
	Non Coal Mining Areas of Great Britain No Hazard				
	Potential for Collapsible Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NE (SW)	0	1	445840 406242
	Potential for Compressible Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NE (SW)	0	1	445840 406242
	Potential for Compressible Ground Stability Hazards Hazard Potential: Moderate Source: British Geological Survey, National Geoscience Information Service	A13SE (E)	46	1	446064 406166
	Potential for Ground Dissolution Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NE (SW)	0	1	445840 406242
	Potential for Landslide Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NE (SW)	0	1	445840 406242
	Potential for Running Sand Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NE (SW)	0	1	445840 406242
	Potential for Running Sand Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13SE (E)	46	1	446064 406166
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NE (SW)	0	1	445840 406242
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13SE (SE)	0	1	445854 406232
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A8NE (S)	216	1	445959 405845

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A12NE (NW)	237	1	445481 406547
	Radon Potential - Radon Affected Areas Affected Area: The property is in a Lower probability radon area (less than 1% of homes are estimated to be at or above the Action Level). Source: British Geological Survey, National Geoscience Information Service	A13NE (SW)	0	1	445840 406242
	Radon Potential - Radon Affected Areas Affected Area: The property is in an Intermediate probability radon area (1 to 3% of homes are estimated to be at or above the Action Level). Source: British Geological Survey, National Geoscience Information Service	A13SE (S)	0	1	445840 406076
	Radon Potential - Radon Protection Measures Protection Measure: No radon protective measures are necessary in the construction of new dwellings or extensions Source: British Geological Survey, National Geoscience Information Service	A13NE (SW)	0	1	445840 406242
	Radon Potential - Radon Protection Measures Protection Measure: No radon protective measures are necessary in the construction of new dwellings or extensions Source: British Geological Survey, National Geoscience Information Service	A13SE (S)	0	1	445840 406076

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
80	**Contemporary Trade Directory Entries** Name: Premier Iron Craft Location: 12, Whin Gardens, Thurnscoe, Rotherham, South Yorkshire, S63 0PJ Classification: Wrought Ironwork **Status: Active** Positional Accuracy: Automatically positioned to the address	A13NW (NW)	18	-	445660 406371
81	**Contemporary Trade Directory Entries** Name: Nippon Thompson (Europe) Location: 41, Briton Street, Thurnscoe, Rotherham, South Yorkshire, S63 0HH Classification: Bearing Manufacturers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A14NW (E)	240	-	446271 406268
81	**Contemporary Trade Directory Entries** Name: A G Engineering Location: 22b, Briton Street, Thurnscoe, ROTHERHAM, South Yorkshire, S63 0HH Classification: Engineers - General **Status: Active** Positional Accuracy: Automatically positioned to the address	A14NW (E)	282	-	446311 406253
82	**Contemporary Trade Directory Entries** Name: On The Move Design & Print Location: 19, Briton Square, Thurnscoe, Rotherham, South Yorkshire, S63 0HQ Classification: Printers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A14SW (E)	240	-	446256 406139
83	**Contemporary Trade Directory Entries** Name: Radar Cleaning Services Location: 9, Deightonby Street, Thurnscoe, Rotherham, South Yorkshire, S63 0JB Classification: Carpet, Curtain & Upholstery Cleaners **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A8NE (SE)	245	-	446055 405819
84	**Contemporary Trade Directory Entries** Name: Jacquis Ironing And Laundry Service Location: 42, Stuart Street, Thurnscoe, Rotherham, South Yorkshire, S63 0ED Classification: Ironing & Home Laundry Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A9NW (SE)	359	-	446285 405840
84	**Contemporary Trade Directory Entries** Name: Jacqui'S Ironing & Laundry Service Location: 42, Stuart Street, Thurnscoe, Rotherham, South Yorkshire, S63 0ED Classification: Ironing & Home Laundry Services **Status: Active** Positional Accuracy: Automatically positioned to the address	A9NW (SE)	359	-	446285 405840
85	**Contemporary Trade Directory Entries** Name: Duane'S Vehicle Recovery Location: 17, Lancaster Street, Thurnscoe, Rotherham, S63 0DZ Classification: Car Breakdown & Recovery Services **Status: Active** Positional Accuracy: Automatically positioned to the address	A14SW (E)	359	-	446370 406099
86	**Contemporary Trade Directory Entries** Name: Sir Cleanalot Location: 54, Merrill Road, Thurnscoe, Rotherham, South Yorkshire, S63 0PS Classification: Cleaning Services - Domestic **Status: Active** Positional Accuracy: Automatically positioned to the address	A12SE (W)	410	-	445232 406120
86	**Contemporary Trade Directory Entries** Name: Sir Cleanalot Location: 54, Merrill Road, Thurnscoe, Rotherham, South Yorkshire, S63 0PS Classification: Carpet, Curtain & Upholstery Cleaners **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12SE (W)	410	-	445232 406120
86	**Contemporary Trade Directory Entries** Name: Crystal Cleaning Group Location: 46, Merrill Road, Thurnscoe, Rotherham, South Yorkshire, S63 0PS Classification: Commercial Cleaning Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12SE (W)	420	-	445224 406096
87	**Contemporary Trade Directory Entries** Name: Chem Care Location: 27, Hanover Street, Thurnscoe, Rotherham, South Yorkshire, S63 0DT Classification: Carpet, Curtain & Upholstery Cleaners **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A14SW (SE)	439	-	446412 405909

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
88	**Contemporary Trade Directory Entries** Name: Valley Park Cleaners Location: 9, Dane Street South, Thurnscoe, Rotherham, South Yorkshire, S63 0DW Classification: Cleaning Services - Domestic **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A9NW (SE)	490	-	446285 405660
89	**Contemporary Trade Directory Entries** Name: Lidget Lane Pet Shop Location: 1, Lidget Lane, Thurnscoe, Rotherham, South Yorkshire, S63 0BY Classification: Pet Foods & Animal Feeds **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A8SE (S)	515	-	446056 405545
90	**Contemporary Trade Directory Entries** Name: Simpsons Pet Shop Location: 101a, Houghton Road, Thurnscoe, Rotherham, South Yorkshire, S63 0NG Classification: Pet Foods & Animal Feeds **Status: Inactive** Positional Accuracy: Automatically positioned in the proximity of the address	A7NE (SW)	545	-	445282 405749
90	**Contemporary Trade Directory Entries** Name: Eco Scooters Bassetlaw Ltd Location: 113, Houghton Road, Thurnscoe, Rotherham, South Yorkshire, S63 0NG Classification: Disability Equipment - Manufacturers & Suppliers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A7NE (SW)	570	-	445234 405759
91	**Contemporary Trade Directory Entries** Name: Bradford Domestic Appliances Location: 32-34, Lidget Lane, Thurnscoe, Rotherham, South Yorkshire, S63 0BT Classification: Domestic Appliances - Servicing, Repairs & Parts **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A8SE (S)	573	-	446117 405496
92	**Contemporary Trade Directory Entries** Name: Bob Green Location: Coronation St, Thurnscoe, Rotherham, South Yorkshire, S63 0EQ Classification: Car Body Repairs **Status: Inactive** Positional Accuracy: Manually positioned to the road within the address or location	A9SW (SE)	591	-	446273 405534
92	**Contemporary Trade Directory Entries** Name: B S R Vehicle Services Location: Whitworth Buildings, Thurnscoe, Rotherham, S63 0EH Classification: Garage Services **Status: Active** Positional Accuracy: Automatically positioned to the address	A9SW (SE)	614	-	446286 405515
93	**Contemporary Trade Directory Entries** Name: Brandels Ltd Location: Unit 1 Princess Dr, Thurnscoe, Rotherham, South Yorkshire, S63 0BL Classification: Brewers' Equipment & Services **Status: Inactive** Positional Accuracy: Manually positioned to the road within the address or location	A8SE (S)	615	-	446154 405462
93	**Contemporary Trade Directory Entries** Name: Dj Print Location: Unit 23, Princess Drive, Thurnscoe, Rotherham, S63 0BL Classification: Printers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A9SW (SE)	645	-	446187 405440
93	**Contemporary Trade Directory Entries** Name: Mad Wilburns Location: Thurnscoe Business Centre, Princess Drive, Thurnscoe, Rotherham, S63 0BL Classification: Painting & Decorating Supplies **Status: Active** Positional Accuracy: Automatically positioned to the address	A9SW (SE)	650	-	446177 405432
93	**Contemporary Trade Directory Entries** Name: Connect Express Ltd Location: Thurnscoe Business Centre, Princess Drive, Thurnscoe, Rotherham, S63 0BL Classification: Distribution Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A9SW (SE)	650	-	446177 405432

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
93	**Contemporary Trade Directory Entries** Name: A T Print Location: Unit 13, Thurnscoe Business Centre, Princess Drive, Thurnscoe, Rotherham, South Yorkshire, S63 0BL Classification: Printers **Status: Active** Positional Accuracy: Automatically positioned to the address	A9SW (SE)	659	-	446196 405429
93	**Contemporary Trade Directory Entries** Name: Go Mobility Ltd Location: Unit 19-20, Thurnscoe Business Centre, Princess Drive, Thurnscoe, Rotherham, South Yorkshire, S63 0BL Classification: Disability Equipment - Manufacturers & Suppliers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A9SW (SE)	659	-	446196 405429
93	**Contemporary Trade Directory Entries** Name: Clencoe Design Location: Unit 9, Princess Drive, Thurnscoe, Rotherham, South Yorkshire, S63 0BL Classification: Wrought Ironwork **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A9SW (SE)	659	-	446196 405429
93	**Contemporary Trade Directory Entries** Name: Kts Location: Unit 11, Thurnscoe Business Centre, Princess Drive, Thurnscoe, Rotherham, South Yorkshire, S63 0BL Classification: Bakery Equipment Manufacturers & Suppliers **Status: Inactive** Positional Accuracy: Manually positioned to the address or location	A9SW (SE)	659	-	446196 405429
93	**Contemporary Trade Directory Entries** Name: The Fibre Optic Co Location: Unit 12, Thurnscoe Business Centre, Princess Drive, Thurnscoe, Rotherham, South Yorkshire, S63 0BL Classification: Fibre Optics **Status: Inactive** Positional Accuracy: Manually positioned to the address or location	A9SW (SE)	659	-	446196 405429
93	**Contemporary Trade Directory Entries** Name: Dearne Valley Blinds Location: Unit 37, Thurnscoe Business Centre, Princess Drive, Thurnscoe, Rotherham, South Yorkshire, S63 0BL Classification: Blinds, Awnings & Canopies **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A9SW (SE)	659	-	446196 405429
93	**Contemporary Trade Directory Entries** Name: C S Logistics Location: Unit 43, Princess Drive, Thurnscoe, Rotherham, S63 0BL Classification: Distribution Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A9SW (SE)	661	-	446192 405425
93	**Contemporary Trade Directory Entries** Name: Donella Location: Unit 43, Princess Drive, Thurnscoe, Rotherham, S63 0BL Classification: Printers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A9SW (SE)	661	-	446192 405425
93	**Contemporary Trade Directory Entries** Name: Go Mobility Ltd Location: Unit 19-20, Thurnscoe Business Centre, Princess Drive, Thurnscoe, Rotherham, S63 0BL Classification: Disability Equipment - Manufacturers & Suppliers **Status: Active** Positional Accuracy: Automatically positioned to the address	A9SW (SE)	664	-	446217 405430
93	**Contemporary Trade Directory Entries** Name: Patrick Drake Location: Unit 6, Thurnscoe Business Centre, Princess Drive, Thurnscoe, Rotherham, S63 0BL Classification: Cabinet Makers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A9SW (SE)	666	-	446201 405422
94	**Contemporary Trade Directory Entries** Name: Thurnscoe Filling Station Location: Houghton Road, Thurnscoe, Rotherham, South Yorkshire, S63 0NJ Classification: Petrol Filling Stations **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A7NW (SW)	629	-	445153 405763

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
95	**Contemporary Trade Directory Entries** Name: J W Unlimited Services Location: 39, Westfield Crescent, Thurnscoe, Rotherham, S63 0PT Classification: Car Breakdown & Recovery Services **Status: Active** Positional Accuracy: Automatically positioned to the address	A12SW (W)	640	-	445011 406042
96	**Contemporary Trade Directory Entries** Name: G T Tyres & Exhausts Uk Ltd Location: Shirley House, Lidget Lane, Thurnscoe, Rotherham, South Yorkshire, S63 0DA Classification: Tyre Dealers **Status: Active** Positional Accuracy: Manually positioned within the geographical locality	A9SW (SE)	677	-	446350 405479
97	**Contemporary Trade Directory Entries** Name: D Greenhall Location: Princess Drive, Thurnscoe, Rotherham, S63 0BL Classification: Tyre Dealers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A8SE (S)	678	-	446114 405389
97	**Contemporary Trade Directory Entries** Name: Raynors Autos Location: Princess Drive, Thurnscoe, Rotherham, S63 0BL Classification: Garage Services **Status: Active** Positional Accuracy: Automatically positioned to the address	A8SE (S)	678	-	446114 405389
98	**Contemporary Trade Directory Entries** Name: Alive Supplies Location: Unit 36, Princess Drive, Thurnscoe, Rotherham, S63 0BL Classification: Cleaning Materials & Equipment **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A9SW (SE)	687	-	446233 405411
99	**Contemporary Trade Directory Entries** Name: Uk Film Sales Location: Westfield Cr, Thurnscoe, Rotherham, South Yorkshire, S63 0PU Classification: Photographic Processors **Status: Inactive** Positional Accuracy: Manually positioned to the road within the address or location	A12SW (W)	720	-	444954 405942
100	**Contemporary Trade Directory Entries** Name: Coast Controls Ltd Location: Unit 4, Thurnscoe Business Park, Thurnscoe, Rotherham, South Yorkshire, S63 0BH Classification: Engineers - General **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A9SW (SE)	753	-	446368 405401
100	**Contemporary Trade Directory Entries** Name: Hayselden Bodyshop Location: 3, Thurnscoe Business Park, Thurnscoe, Rotherham, S63 0BH Classification: Car Body Repairs **Status: Active** Positional Accuracy: Automatically positioned to the address	A9SW (SE)	767	-	446402 405405
101	**Contemporary Trade Directory Entries** Name: P & L Minis Location: 34, High Street, Thurnscoe, Rotherham, South Yorkshire, S63 0SU Classification: Car Dealers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A7SE (SW)	757	-	445426 405429
102	**Contemporary Trade Directory Entries** Name: K L S Location: 84, High Street, Thurnscoe, Rotherham, South Yorkshire, S63 0QH Classification: Motor Cycle Breakers & Dismantlers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A7SE (SW)	767	-	445267 405489
103	**Contemporary Trade Directory Entries** Name: N C S Trailers Ltd Location: Phoenix Lane, Thurnscoe, Rotherham, South Yorkshire, S63 0BD Classification: Commercial Vehicle Bodybuilders & Repairers **Status: Active** Positional Accuracy: Automatically positioned to the address	A9SW (SE)	780	-	446333 405353

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
104	**Contemporary Trade Directory Entries** Name: P W E Accident & Repair Centre Location: 2, Thurnscoe Business Park, Thurnscoe, Rotherham, South Yorkshire, S63 0BH Classification: Car Body Repairs **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A9SW (SE)	784	-	446427 405401
104	**Contemporary Trade Directory Entries** Name: Public Image Location: Thurnscoe Business Centre, Princess Drive, Thurnscoe, Rotherham, South Yorkshire, S63 0BL Classification: Screen Process Printers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A9SW (SE)	811	-	446470 405398
105	**Contemporary Trade Directory Entries** Name: Kesscass Scaffolding Services Location: 8, High Street, Thurnscoe, Rotherham, South Yorkshire, S63 0SU Classification: Scaffolding & Work Platforms **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A8SW (S)	792	-	445566 405344
106	**Contemporary Trade Directory Entries** Name: Balmoral Industrial Tanks Ltd Location: Barrowfield Road, Thurnscoe, Rotherham, S63 0EW Classification: Tanks, Vats & Cisterns **Status: Active** Positional Accuracy: Manually positioned to the road within the address or location	A9SW (SE)	801	-	446249 405296
107	**Contemporary Trade Directory Entries** Name: Close Brothers Brewery Rentals Container Services Location: Unit 9b, Albion Drive, Thurnscoe, Rotherham, S63 0BA Classification: Drums, Kegs, Barrels & Casks **Status: Active** Positional Accuracy: Automatically positioned to the address	A9NE (SE)	807	-	446765 405805
108	**Contemporary Trade Directory Entries** Name: Print Domain Ltd Location: 107, High Street, Thurnscoe, Rotherham, S63 0QZ Classification: Printers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A7SW (SW)	849	-	445080 405521
108	**Contemporary Trade Directory Entries** Name: Print Domain Ltd Location: 107, High Street, Thurnscoe, Rotherham, South Yorkshire, S63 0QZ Classification: Printers **Status: Active** Positional Accuracy: Automatically positioned to the address	A7SW (SW)	849	-	445080 405521
109	**Contemporary Trade Directory Entries** Name: Improve Cleaning Services Location: 189, Houghton Road, Thurnscoe, Rotherham, South Yorkshire, S63 0SA Classification: Steam Cleaning Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A7NW (SW)	849	-	444863 405820
110	**Contemporary Trade Directory Entries** Name: Church Hall Garage Ltd Location: High Street, Thurnscoe, Rotherham, S63 0QZ Classification: Garage Services **Status: Active** Positional Accuracy: Automatically positioned to the address	A7SW (SW)	888	-	445004 405540
111	**Contemporary Trade Directory Entries** Name: G T Tyres & Exhausts Uk Ltd Location: 17, Vincent Terrace, Thurnscoe, Rotherham, South Yorkshire, S63 0DE Classification: Tyre Dealers **Status: Active** Positional Accuracy: Automatically positioned to the address	A9SE (SE)	923	-	446684 405440
112	**Contemporary Trade Directory Entries** Name: Qualconvey Location: Unit 11, Albion Drive, Thurnscoe, Rotherham, South Yorkshire, S63 0BA Classification: Materials Handling Equipment **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A9NE (SE)	926	-	446807 405605

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
112	**Contemporary Trade Directory Entries** Name: C B R Container Services Location: Unit 9b, Albion Drive, Thurnscoe, Rotherham, South Yorkshire, S63 0BA Classification: Drums, Kegs, Barrels & Casks **Status:** **Inactive** Positional Accuracy: Automatically positioned to the address	A9NE (SE)	926	-	446793 405581
112	**Contemporary Trade Directory Entries** Name: Automate Location: Unit 11, Albion Drive, Thurnscoe, Rotherham, South Yorkshire, S63 0BA Classification: Garage Services **Status:** **Inactive** Positional Accuracy: Manually positioned to the address or location	A9NE (SE)	926	-	446807 405605
112	**Contemporary Trade Directory Entries** Name: T T Lifting Services Ltd Location: Unit 12f, Albion Drive, Thurnscoe, Rotherham, South Yorkshire, S63 0BA Classification: Lifting Equipment **Status:** **Inactive** Positional Accuracy: Automatically positioned to the address	A9NE (SE)	957	-	446833 405588
112	**Contemporary Trade Directory Entries** Name: Visibility Ltd Location: Albion Drive, Thurnscoe, Rotherham, South Yorkshire, S63 0BA Classification: Drums, Kegs, Barrels & Casks **Status:** **Inactive** Positional Accuracy: Manually positioned within the geographical locality	A9NE (SE)	958	-	446841 405601
112	**Contemporary Trade Directory Entries** Name: A J R Fabrications Location: Unit 12h, Albion Drive, Thurnscoe, Rotherham, South Yorkshire, S63 0BA Classification: Wrought Ironwork **Status:** **Inactive** Positional Accuracy: Automatically positioned to the address	A9NE (SE)	958	-	446841 405601
112	**Contemporary Trade Directory Entries** Name: Maan Engineering Ltd Location: Heritage House, Albion Drive, Thurnscoe, Rotherham, South Yorkshire, S63 0BA Classification: Hydraulic Systems & Equipment Manufacturers **Status:** **Inactive** Positional Accuracy: Manually positioned within the geographical locality	A9NE (SE)	958	-	446841 405601
113	**Contemporary Trade Directory Entries** Name: Europa Wire Rope Location: Lidget Works, Albion Drive, Thurnscoe, Rotherham, South Yorkshire, S63 0BA Classification: Ropes & Hawsers **Status:** **Inactive** Positional Accuracy: Automatically positioned to the address	A9SE (SE)	973	-	446807 405516
113	**Contemporary Trade Directory Entries** Name: Technical Lifting Solutions Ltd Location: Technical Lifting Solutions, Albion Drive, Barnsley, S63 0BA Classification: Lifting Equipment **Status:** **Inactive** Positional Accuracy: Automatically positioned to the address	A9SE (SE)	987	-	446826 405519
113	**Contemporary Trade Directory Entries** Name: Dearne Valley Foods Ltd Location: Unit 8-9, Albion Drive, Thurnscoe, Rotherham, South Yorkshire, S63 0BA Classification: Food Products - Manufacturers **Status:** **Inactive** Positional Accuracy: Automatically positioned to the address	A9SE (SE)	988	-	446844 405547
114	**Contemporary Trade Directory Entries** Name: D & G Utilitys Ltd Location: Unit 12a, Albion Drive, Thurnscoe, Rotherham, South Yorkshire, S63 0BA Classification: Engineers - General **Status:** **Active** Positional Accuracy: Automatically positioned to the address	A10NW (SE)	992	-	446881 405604
115	**Fuel Station Entries** Name: Thurnscoe Filling Station Location: Houghton Road , Thurnscoe , Rotherham, South Yorkshire, S63 0JX Brand: Obsolete Premises Type: Not Applicable **Status:** **Obsolete** Positional Accuracy: Automatically positioned to the address	A7NW (SW)	629	-	445152 405763

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
116	**Areas of Adopted Green Belt** Authority: Barnsley Metropolitan Borough Council, Planning Department Plan Name: Barnsley Unitary Development Plan **Status:** **Adopted** Plan Date: 31st December 2000	A13NE (NE)	0	8	445904 406385
117	**Areas of Adopted Green Belt** Authority: Doncaster Metropolitan Borough Council Plan Name: Doncaster Unitary Development Plan **Status:** **Adopted** Plan Date: 31st July 1998	A18SE (N)	334	9	445966 406737
118	**Nitrate Vulnerable Zones** Name: River Dearne Nvz Description: Surface Water Source: Environment Agency, Head Office	A13NE (SW)	0	10	445840 406242
119	**Nitrate Vulnerable Zones** Name: Ea Beck From The Skell To Goosepool Drain Nvz Description: Surface Water Source: Environment Agency, Head Office	A18SE (N)	340	10	445969 406742

Agency & Hydrological	Version	Update Cycle
Contaminated Land Register Entries and Notices		
Doncaster Metropolitan Borough Council - Environmental Services	April 2014	Annual Rolling Update
Rotherham Metropolitan Borough Council - Environmental Health Department	April 2014	Annual Rolling Update
Barnsley Metropolitan Borough Council - Environmental Health and Trading Standards	July 2013	Annual Rolling Update
Wakefield City Metropolitan District Council - Environmental Health	March 2015	Annual Rolling Update
Discharge Consents		
Environment Agency - North East Region	July 2018	Quarterly
Enforcement and Prohibition Notices		
Environment Agency - North East Region	March 2013	As notified
Integrated Pollution Controls		
Environment Agency - North East Region	October 2008	Variable
Integrated Pollution Prevention And Control		
Environment Agency - North East Region	July 2018	Quarterly
Local Authority Integrated Pollution Prevention And Control		
Barnsley Metropolitan Borough Council - Environmental Health and Trading Standards	April 2014	Variable
Doncaster Metropolitan Borough Council - Environmental Services	June 2014	Variable
Wakefield City Metropolitan District Council - Environmental Health	June 2014	Variable
Rotherham Metropolitan Borough Council - Planning Department	October 2014	Variable
Local Authority Pollution Prevention and Controls		
Barnsley Metropolitan Borough Council - Environmental Health and Trading Standards	April 2014	Annual Rolling Update
Doncaster Metropolitan Borough Council - Environmental Services	June 2014	Annual Rolling Update
Wakefield City Metropolitan District Council - Environmental Health	June 2014	Annual Rolling Update
Rotherham Metropolitan Borough Council - Planning Department	October 2014	Annual Rolling Update
Local Authority Pollution Prevention and Control Enforcements		
Barnsley Metropolitan Borough Council - Environmental Health and Trading Standards	April 2014	Variable
Doncaster Metropolitan Borough Council - Environmental Services	June 2014	Variable
Wakefield City Metropolitan District Council - Environmental Health	June 2014	Variable
Rotherham Metropolitan Borough Council - Planning Department	October 2014	Variable
Nearest Surface Water Feature		
Ordnance Survey	September 2017	
Pollution Incidents to Controlled Waters		
Environment Agency - North East Region	December 1998	Not Applicable
Prosecutions Relating to Authorised Processes		
Environment Agency - North East Region	March 2013	As notified
Prosecutions Relating to Controlled Waters		
Environment Agency - North East Region	March 2013	As notified
Registered Radioactive Substances		
Environment Agency - North East Region	January 2015	
River Quality		
Environment Agency - Head Office	November 2001	Not Applicable
River Quality Biology Sampling Points		
Environment Agency - Head Office	July 2012	Annually
River Quality Chemistry Sampling Points		
Environment Agency - Head Office	July 2012	Annually
Substantiated Pollution Incident Register		
Environment Agency - North East Region - Ridings Area	July 2018	Quarterly
Environment Agency - North East Region - Yorkshire Area	July 2018	Quarterly
Water Abstractions		
Environment Agency - North East Region	July 2018	Quarterly
Water Industry Act Referrals		
Environment Agency - North East Region	October 2017	Quarterly

Agency & Hydrological	Version	Update Cycle
Groundwater Vulnerability Environment Agency - Head Office	April 2015	Not Applicable
Drift Deposits Environment Agency - Head Office	January 1999	Not Applicable
Bedrock Aquifer Designations British Geological Survey - National Geoscience Information Service	August 2015	As notified
Superficial Aquifer Designations British Geological Survey - National Geoscience Information Service	August 2015	As notified
Source Protection Zones Environment Agency - Head Office	January 2018	Quarterly
Extreme Flooding from Rivers or Sea without Defences Environment Agency - Head Office	May 2018	Quarterly
Flooding from Rivers or Sea without Defences Environment Agency - Head Office	May 2018	Quarterly
Areas Benefiting from Flood Defences Environment Agency - Head Office	May 2018	Quarterly
Flood Water Storage Areas Environment Agency - Head Office	May 2018	Quarterly
Flood Defences Environment Agency - Head Office	May 2018	Quarterly
OS Water Network Lines Ordnance Survey	May 2018	Quarterly
BGS Groundwater Flooding Susceptibility British Geological Survey - National Geoscience Information Service	May 2013	As notified

Waste	Version	Update Cycle
BGS Recorded Landfill Sites		
British Geological Survey - National Geoscience Information Service	June 1996	Not Applicable
Historical Landfill Sites		
Environment Agency - Head Office	April 2018	Quarterly
Integrated Pollution Control Registered Waste Sites		
Environment Agency - North East Region	October 2008	Not Applicable
Licensed Waste Management Facilities (Landfill Boundaries)		
Environment Agency - North East Region - Ridings Area	April 2018	Quarterly
Environment Agency - North East Region - Yorkshire Area	April 2018	Quarterly
Licensed Waste Management Facilities (Locations)		
Environment Agency - North East Region - Ridings Area	July 2018	Quarterly
Environment Agency - North East Region - Yorkshire Area	July 2018	Quarterly
Local Authority Landfill Coverage		
Barnsley Metropolitan Borough Council - Environmental Health and Trading Standards	May 2000	Not Applicable
Doncaster Metropolitan Borough Council - Environmental Services	May 2000	Not Applicable
Rotherham Metropolitan Borough Council - Environmental Health Department	May 2000	Not Applicable
Wakefield City Metropolitan District Council - Environmental Health	May 2000	Not Applicable
Local Authority Recorded Landfill Sites		
Barnsley Metropolitan Borough Council - Environmental Health and Trading Standards	May 2000	Not Applicable
Doncaster Metropolitan Borough Council - Environmental Services	May 2000	Not Applicable
Rotherham Metropolitan Borough Council - Environmental Health Department	May 2000	Not Applicable
Wakefield City Metropolitan District Council - Environmental Health	May 2000	Not Applicable
Registered Landfill Sites		
Environment Agency - North East Region - Ridings Area	March 2003	Not Applicable
Environment Agency - North East Region - Yorkshire Area	March 2003	Not Applicable
Registered Waste Transfer Sites		
Environment Agency - North East Region - Ridings Area	March 2003	Not Applicable
Environment Agency - North East Region - Yorkshire Area	March 2003	Not Applicable
Registered Waste Treatment or Disposal Sites		
Environment Agency - North East Region - Ridings Area	March 2003	Not Applicable
Environment Agency - North East Region - Yorkshire Area	March 2003	Not Applicable
Hazardous Substances	**Version**	**Update Cycle**
Control of Major Accident Hazards Sites (COMAH)		
Health and Safety Executive	April 2018	Bi-Annually
Explosive Sites		
Health and Safety Executive	March 2017	Variable
Notification of Installations Handling Hazardous Substances (NIHHS)		
Health and Safety Executive	November 2000	Not Applicable
Planning Hazardous Substance Enforcements		
Rotherham Metropolitan Borough Council	February 2016	Variable
Wakefield City Metropolitan District Council	February 2016	Variable
Barnsley Metropolitan Borough Council - Planning Department	January 2016	Variable
Doncaster Metropolitan Borough Council	October 2015	Variable
Planning Hazardous Substance Consents		
Rotherham Metropolitan Borough Council	February 2016	Variable
Wakefield City Metropolitan District Council	February 2016	Variable
Barnsley Metropolitan Borough Council - Planning Department	January 2016	Variable
Doncaster Metropolitan Borough Council	October 2015	Variable

Geological	Version	Update Cycle
BGS 1:625,000 Solid Geology British Geological Survey - National Geoscience Information Service	January 2009	Not Applicable
BGS Recorded Mineral Sites British Geological Survey - National Geoscience Information Service	May 2018	Bi-Annually
CBSCB Compensation District Cheshire Brine Subsidence Compensation Board (CBSCB)	August 2011	Not Applicable
Coal Mining Affected Areas The Coal Authority - Property Searches	March 2014	As notified
Mining Instability Ove Arup & Partners	October 2000	Not Applicable
Non Coal Mining Areas of Great Britain British Geological Survey - National Geoscience Information Service	May 2015	Not Applicable
Potential for Collapsible Ground Stability Hazards British Geological Survey - National Geoscience Information Service	June 2015	As notified
Potential for Compressible Ground Stability Hazards British Geological Survey - National Geoscience Information Service	June 2015	As notified
Potential for Ground Dissolution Stability Hazards British Geological Survey - National Geoscience Information Service	June 2015	As notified
Potential for Landslide Ground Stability Hazards British Geological Survey - National Geoscience Information Service	June 2015	As notified
Potential for Running Sand Ground Stability Hazards British Geological Survey - National Geoscience Information Service	June 2015	As notified
Potential for Shrinking or Swelling Clay Ground Stability Hazards British Geological Survey - National Geoscience Information Service	June 2015	As notified
Radon Potential - Radon Affected Areas British Geological Survey - National Geoscience Information Service	July 2011	As notified
Radon Potential - Radon Protection Measures British Geological Survey - National Geoscience Information Service	July 2011	As notified
Industrial Land Use	**Version**	**Update Cycle**
Contemporary Trade Directory Entries Thomson Directories	May 2018	Quarterly
Fuel Station Entries Catalist Ltd - Experian	August 2018	Quarterly
Gas Pipelines National Grid	July 2014	
Underground Electrical Cables National Grid	December 2015	

Sensitive Land Use	Version	Update Cycle
Ancient Woodland		
Natural England	August 2018	Bi-Annually
Areas of Adopted Green Belt		
Barnsley Metropolitan Borough Council - Planning Department	August 2018	As notified
Doncaster Metropolitan Borough Council	August 2018	As notified
Rotherham Metropolitan Borough Council	August 2018	As notified
Wakefield City Metropolitan District Council	August 2018	As notified
Areas of Unadopted Green Belt		
Barnsley Metropolitan Borough Council - Planning Department	August 2018	As notified
Doncaster Metropolitan Borough Council	August 2018	As notified
Rotherham Metropolitan Borough Council	August 2018	As notified
Wakefield City Metropolitan District Council	August 2018	As notified
Areas of Outstanding Natural Beauty		
Natural England	August 2018	Bi-Annually
Environmentally Sensitive Areas		
Natural England	January 2017	
Forest Parks		
Forestry Commission	April 1997	Not Applicable
Local Nature Reserves		
Natural England	August 2018	Bi-Annually
Marine Nature Reserves		
Natural England	January 2018	Bi-Annually
National Nature Reserves		
Natural England	August 2018	Bi-Annually
National Parks		
Natural England	April 2017	Bi-Annually
Nitrate Vulnerable Zones		
Environment Agency - Head Office	December 2017	Bi-Annually
Department for Environment, Food and Rural Affairs (DEFRA - formerly FRCA)	October 2015	
Ramsar Sites		
Natural England	August 2018	Bi-Annually
Sites of Special Scientific Interest		
Natural England	February 2018	Bi-Annually
Special Areas of Conservation		
Natural England	August 2018	Bi-Annually
Special Protection Areas		
Natural England	August 2018	Bi-Annually

Data Suppliers

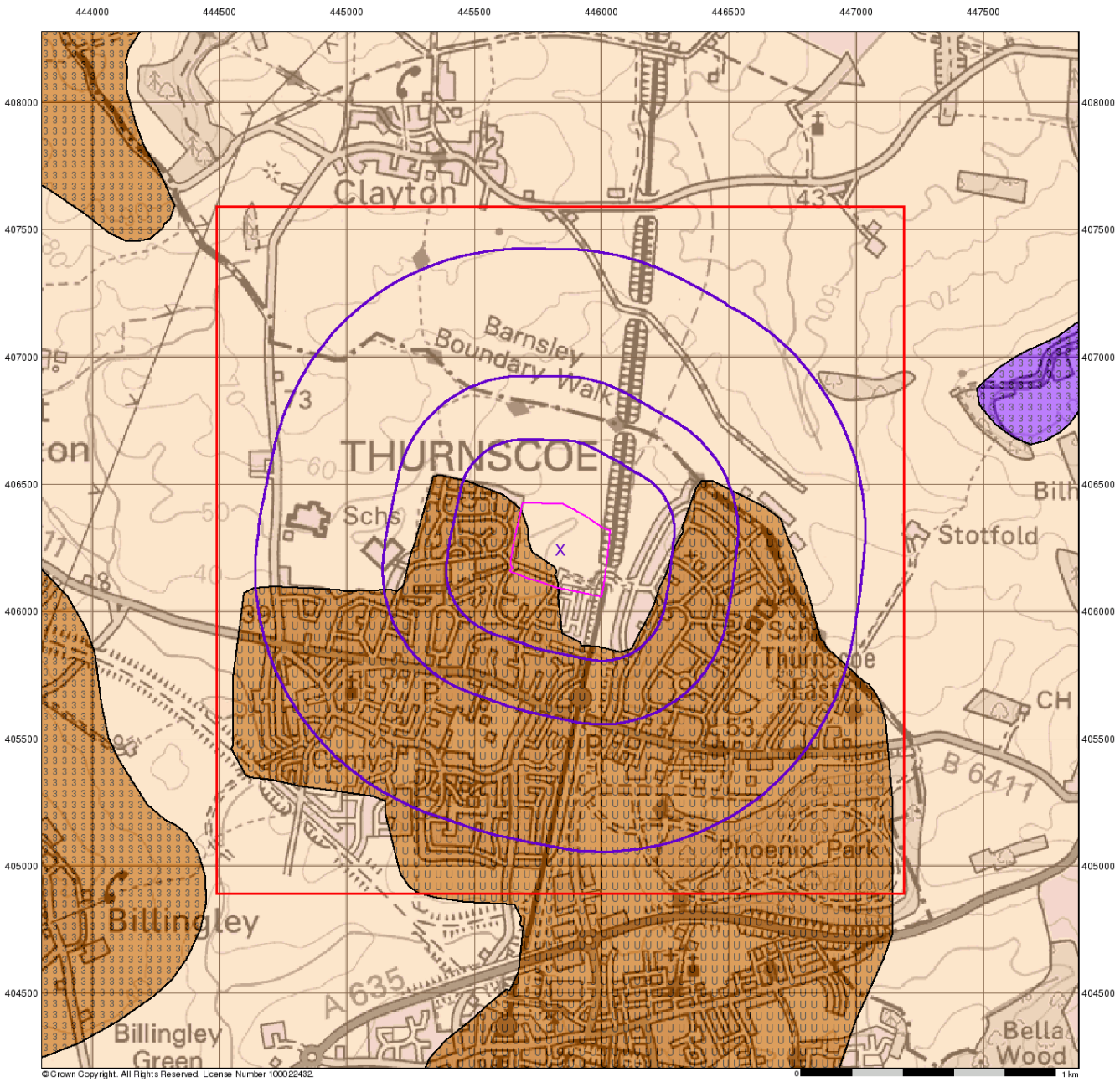
A selection of organisations who provide data within this report

Data Supplier	Data Supplier Logo
Ordnance Survey	
Environment Agency	
Scottish Environment Protection Agency	
The Coal Authority	
British Geological Survey	
Centre for Ecology and Hydrology	
Natural Resources Wales	
Scottish Natural Heritage	
Natural England	
Public Health England	
Ove Arup	
Peter Brett Associates	

Useful Contacts

Contact	Name and Address	Contact Details
1	**British Geological Survey - Enquiry Service** British Geological Survey, Environmental Science Centre, Keyworth, Nottingham, Nottinghamshire, NG12 5GG	Telephone: 0115 936 3143 Fax: 0115 936 3276 Email: enquiries@bgs.ac.uk Website: www.bgs.ac.uk
2	**Environment Agency - National Customer Contact Centre (NCCC)** PO Box 544, Templeborough, Rotherham, S60 1BY	Telephone: 03708 506 506 Email: enquiries@environment-agency.gov.uk
3	**Barnsley Metropolitan Borough Council - Environmental Health and Trading Standards** Central Offices, Kendray Street, Barnsley, South Yorkshire, S70 2TN	Telephone: 01226 770770 Fax: 01226 772599 Website: www.barnsley.gov.uk
4	**Ordnance Survey** Adanac Drive, Southampton, Hampshire, SO16 0AS	Telephone: 03456 05 05 05 Email: customerservices@ordnancesurvey.co.uk Website: www.ordnancesurvey.gov.uk
5	**Doncaster Metropolitan Borough Council - Environmental Services** Floor 3, Council House, College Road, Doncaster, South Yorkshire, DN1 1RN	Telephone: 01302 734444 Fax: 01302 734949 Website: www.doncaster.gov.uk
6	**The Coal Authority - Property Searches** 200 Lichfield Lane, Mansfield, Nottinghamshire, NG18 4RG	Telephone: 0345 762 6848 Fax: 01623 637 338 Email: groundstability@coal.gov.uk Website: www2.groundstability.com
7	**Natural England** County Hall, Spetchley Road, Worcester, WR5 2NP	Telephone: 0300 060 3900 Email: enquiries@naturalengland.org.uk Website: www.naturalengland.org.uk
8	**Barnsley Metropolitan Borough Council - Planning Department** Central Offices, Kendray Street, Barnsley, South Yorkshire, S70 2TN	Telephone: 01226 770770 Fax: 01226 772599 Website: www.barnsley.gov.uk
9	**Doncaster Metropolitan Borough Council** Danum House, St Sepulchre Gate, Doncaster, South Yorkshire, DN1 1UB	Telephone: 01302 734854 Fax: 01302 734949 Website: www.doncaster.gov.uk
10	**Environment Agency - Head Office** Rio House, Waterside Drive, Aztec West, Almondsbury, Bristol, Avon, BS32 4UD	Telephone: 01454 624400 Fax: 01454 624409
-	**Public Health England - Radon Survey, Centre for Radiation, Chemical and Environmental Hazards** Chilton, Didcot, Oxfordshire, OX11 0RQ	Telephone: 01235 822622 Fax: 01235 833891 Email: radon@phe.gov.uk Website: www.ukradon.org
-	**Landmark Information Group Limited** Imperium, Imperial Way, Reading, Berkshire, RG2 0TD	Telephone: 0844 844 9952 Fax: 0844 844 9951 Email: customerservices@landmarkinfo.co.uk Website: www.landmarkinfo.co.uk

Please note that the Environment Agency / Natural Resources Wales / SEPA have a charging policy in place for enquiries.



Groundwater Vulnerability

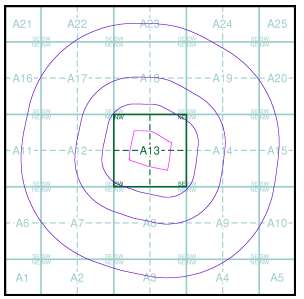
General

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

Agency and Hydrological

Geological Classes	Soil Classes
Major Aquifer (Highly Permeable)	High (H) 1, 2, 3, U
	Intermediate (I) 1, 2
	Low
Minor Aquifer (Variably Permeable)	High (H) 1, 2, 3, U
	Intermediate (I) 1, 2
	Low
Non Aquifer (Negligibly Permeable)	
Water or Sea	
Drift Deposit	

Site Sensitivity Context Map - Slice A



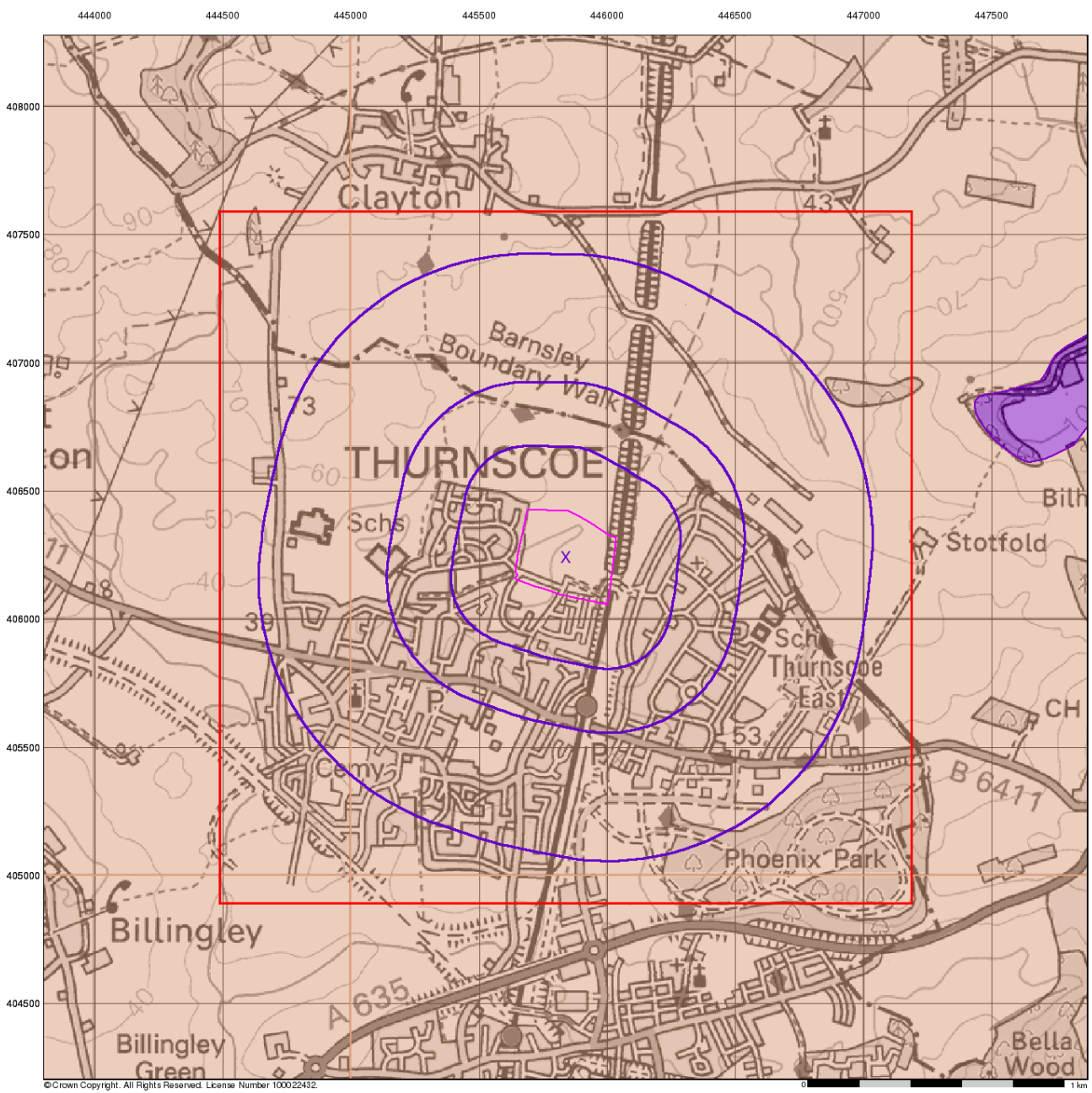
Order Details

Order Number:	178227804_1_1
Customer Ref:	C8023
National Grid Reference:	445840, 406240
Slice:	A
Site Area (Ha):	10.93
Search Buffer (m):	1000

Site Details

Phase 3, Thurnscoe, ROTHERHAM, S63 0PQ

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



Bedrock Aquifer Designation

General

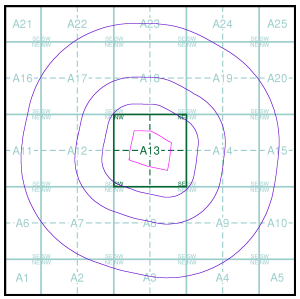
Specified Site | Specified Buffer(s) | Bearing Reference Point | Slice | Map ID

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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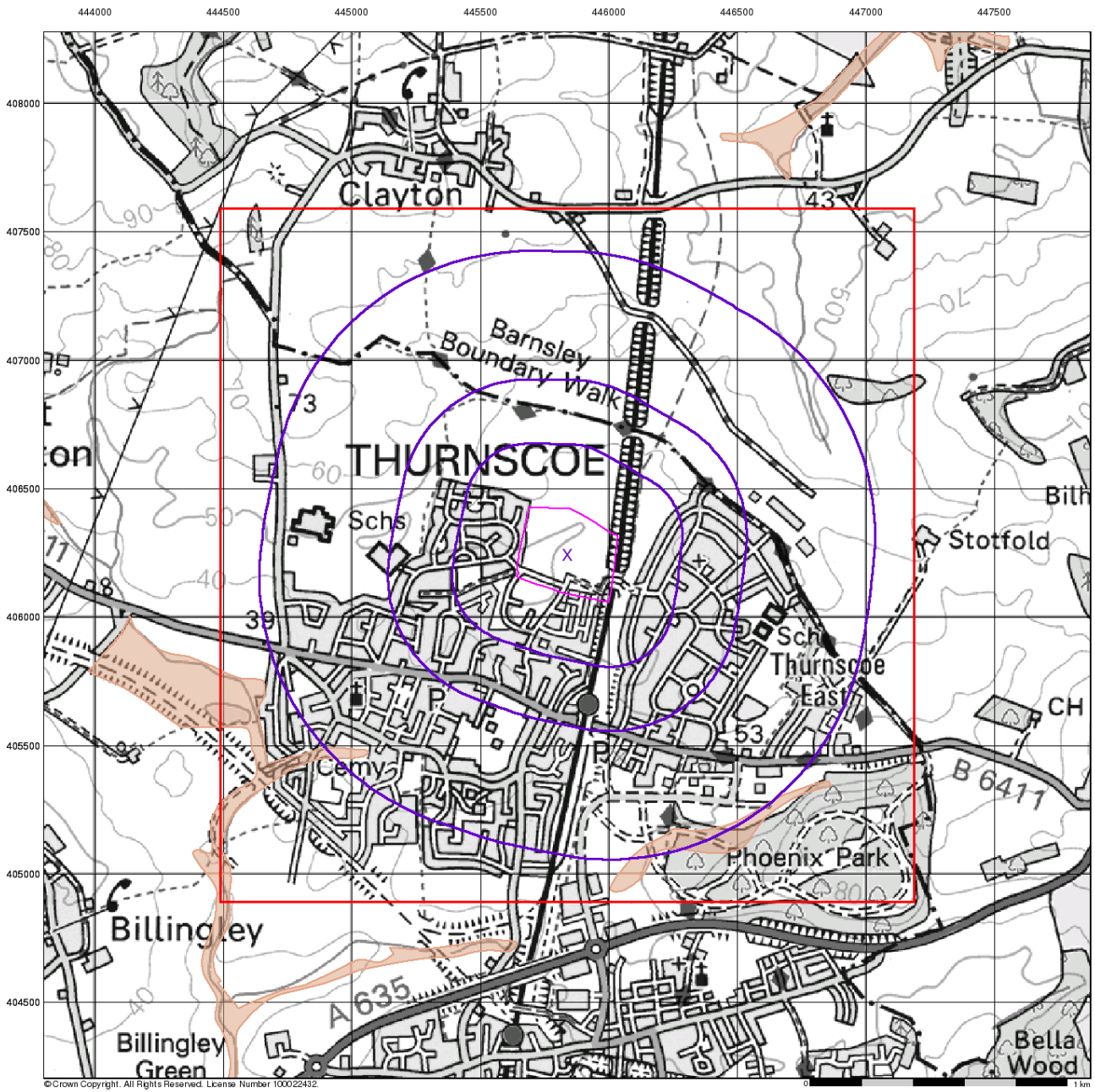


Superficial Aquifer Designation

General

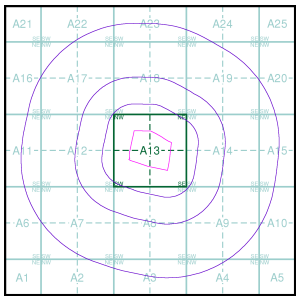
Specified Site | Specified Buffer(s) | Bearing Reference Point | Slice | Map ID

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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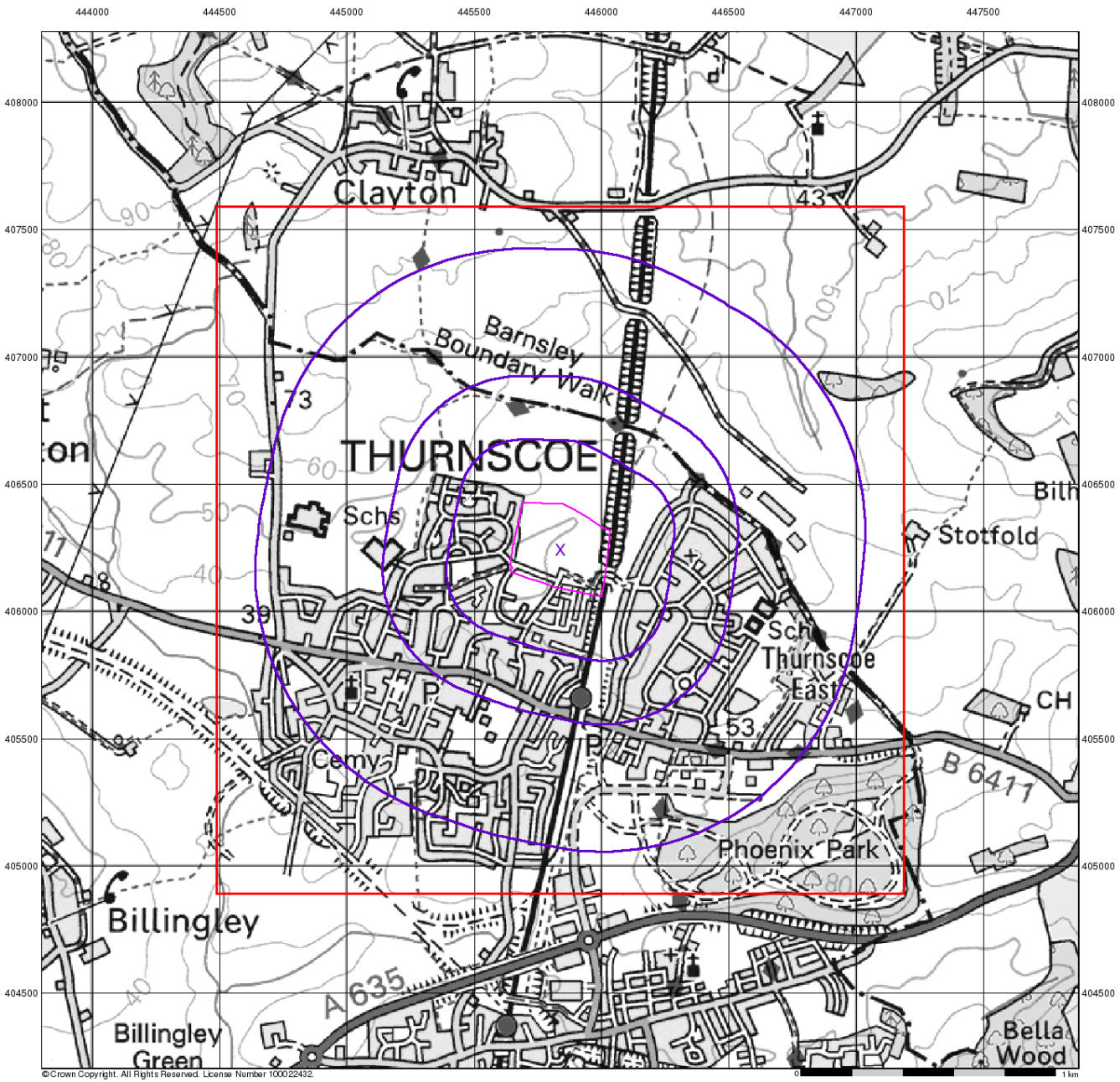


Source Protection Zones

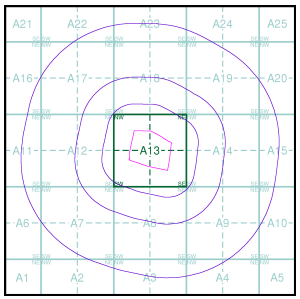
General

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

Agency and Hydrological

- Inner zone (Zone 1)
- Inner zone - subsurface activity only (Zone 1c)
- Outer zone (Zone 2)
- Outer zone - subsurface activity only (Zone 2c)
- Total catchment (Zone 3)
- Total catchment - subsurface activity only (Zone 3c)
- Special interest (Zone 4)

Site Sensitivity Context Map - Slice A



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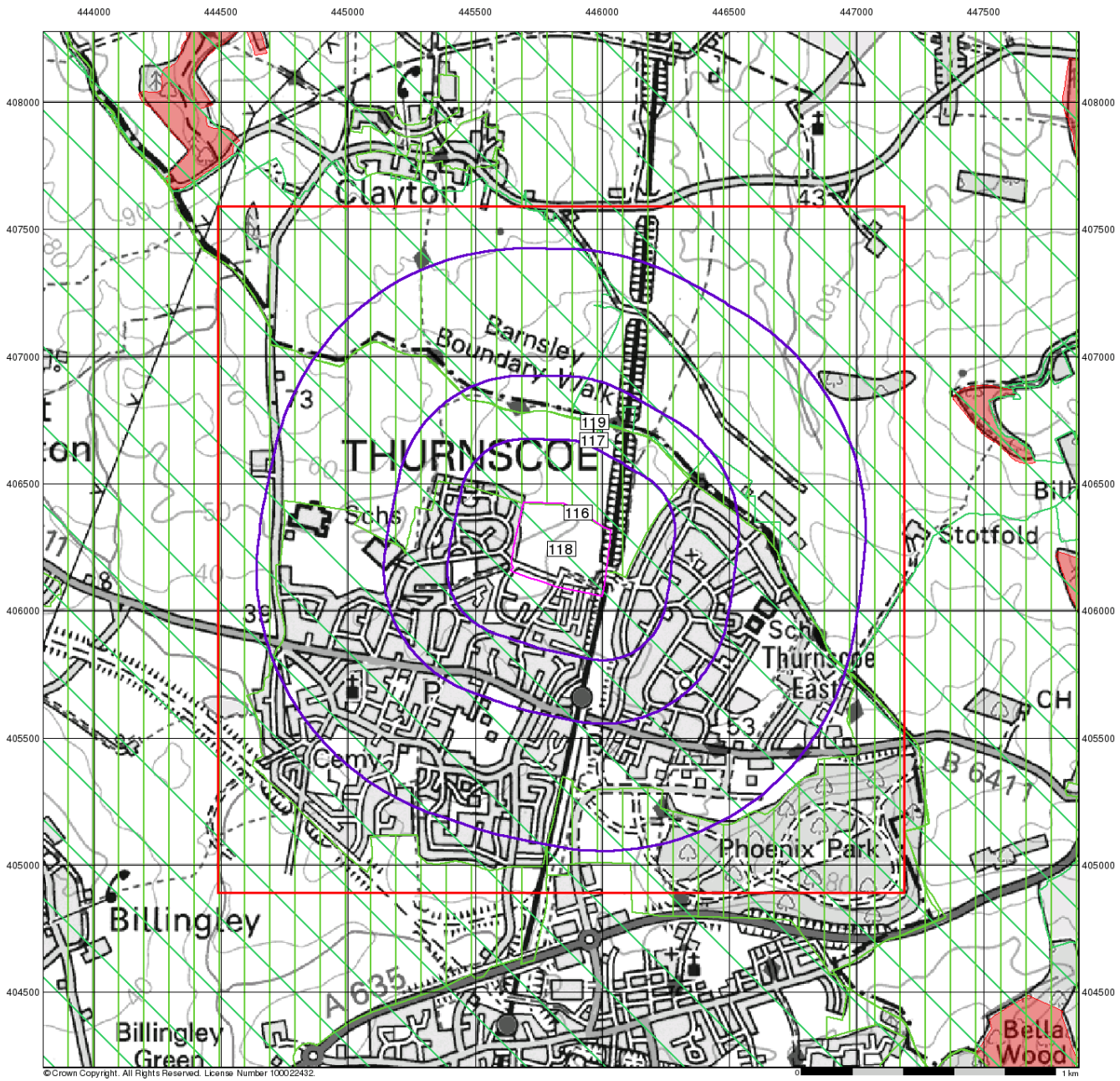


Sensitive Land Uses

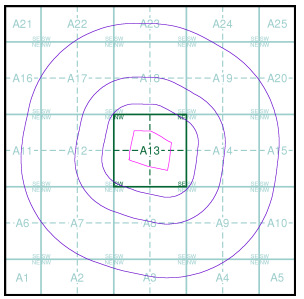
General

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

Sensitive Land Uses

- Ancient Woodland
- Area of Adopted Green Belt
- Area of Unadopted Green Belt
- Area of Outstanding Natural Beauty
- Environmentally Sensitive Area
- Forest Park
- Local Nature Reserve
- Marine Nature Reserve
- National Nature Reserve
- National Park
- Nitrate Sensitive Area
- Nitrate Vulnerable Zone
- Ramsar Site
- Site of Special Scientific Interest
- Special Area of Conservation
- Special Protection Area
- World Heritage Sites

Site Sensitivity Context Map - Slice A



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Site Details

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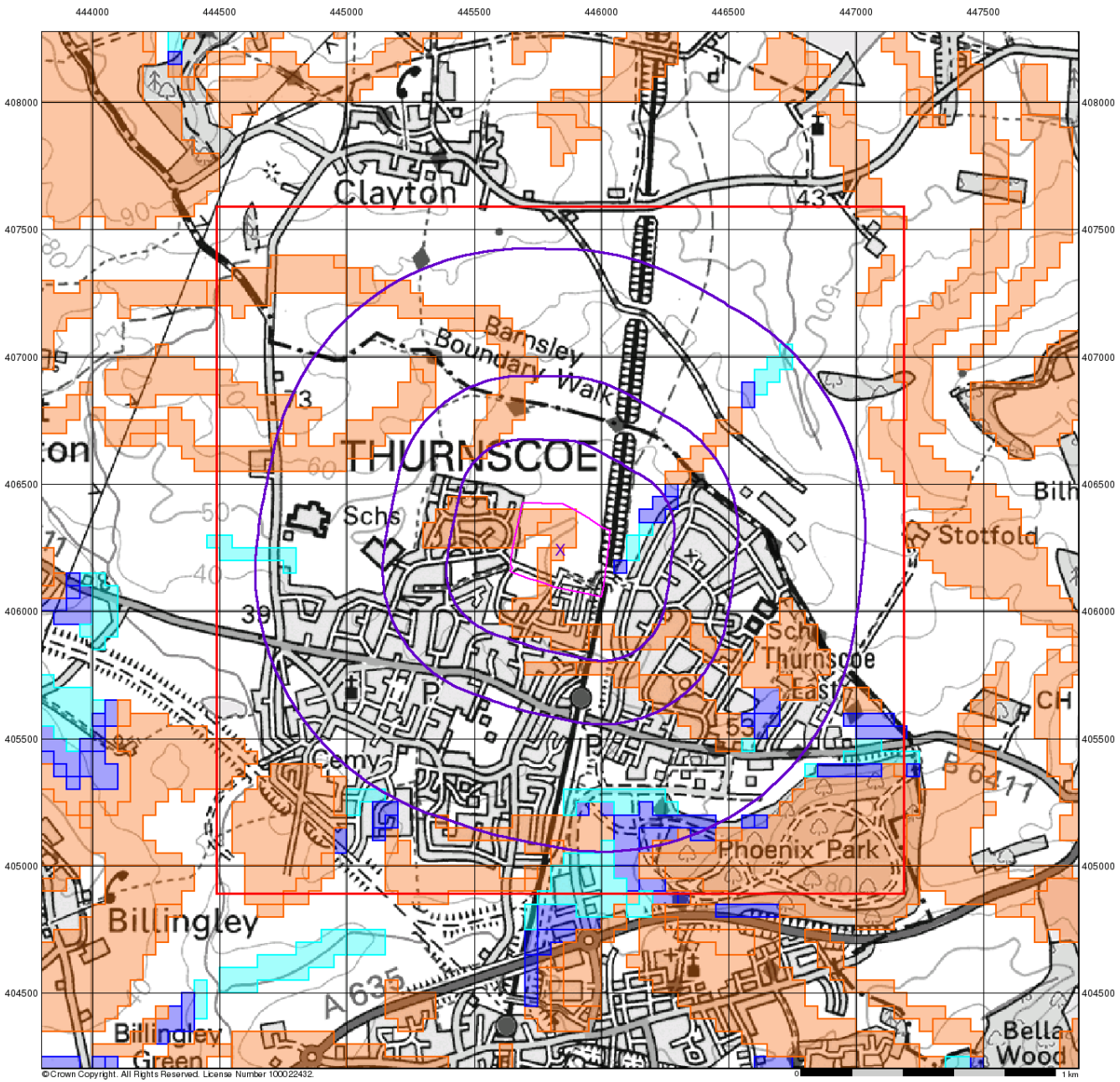


BGS Flood GFS Data

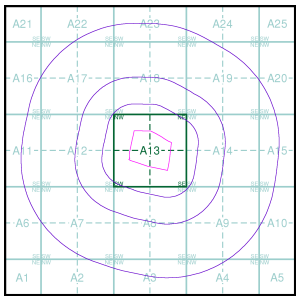
General

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

Agency and Hydrological (Flood)

- Limited Potential for Groundwater Flooding to Occur
- Potential for Groundwater Flooding of Property Situated Below Ground Level
- Potential for Groundwater Flooding to Occur at Surface

Site Sensitivity Context Map - Slice A



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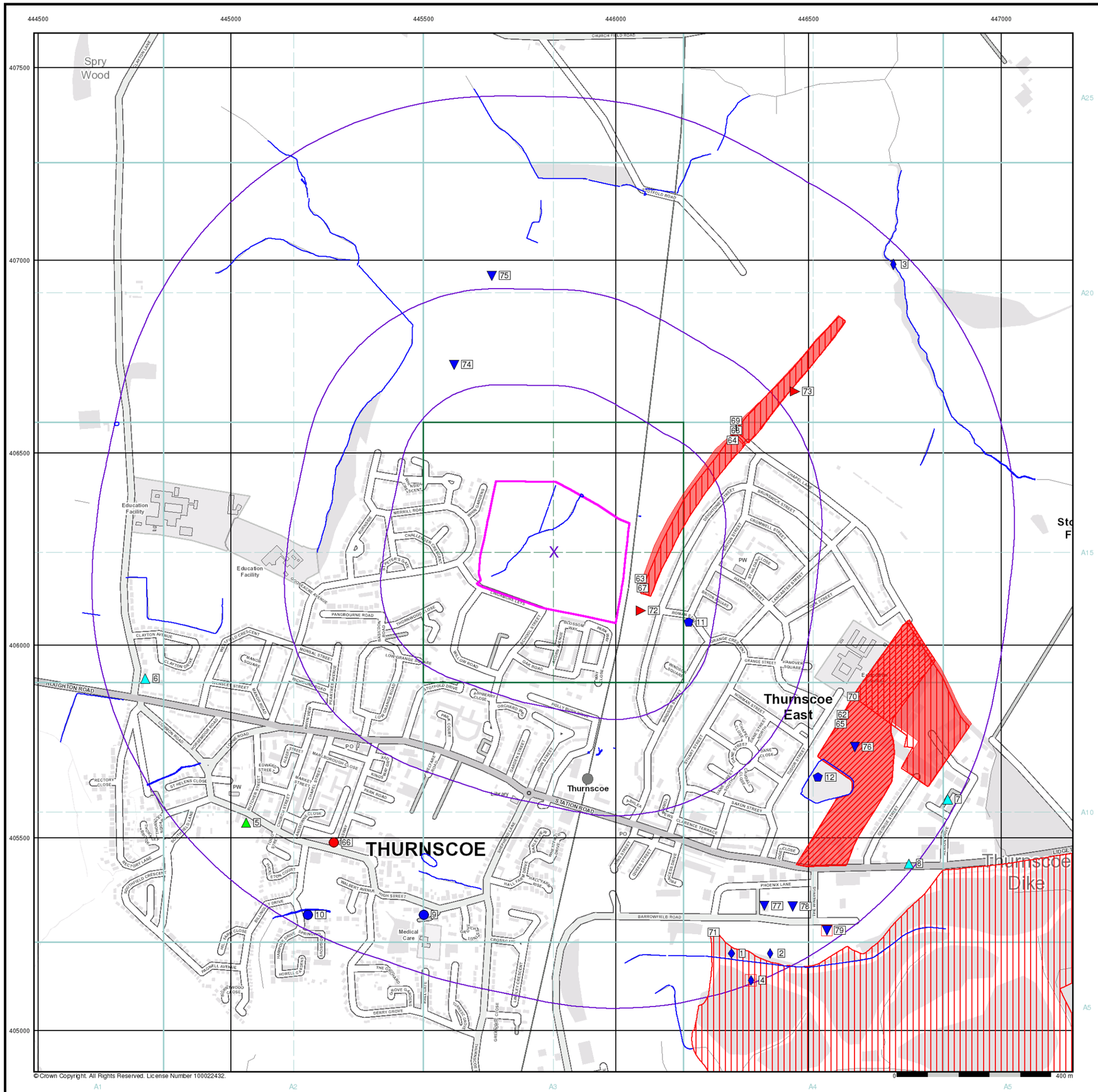

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General

- 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
- Prosecution Relating to Authorised Processes
- Prosecution Relating to Controlled Waters
- Registered Radioactive Substance
- River Network or Water Feature
- River Quality Sampling Point
- 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
- 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

Geological

- BGS Recorded Mineral Site

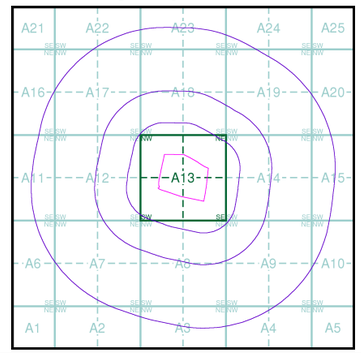
Hazardous Substances

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

Industrial Land Use

- Contemporary Trade Directory Entry
- Fuel Station Entry

Site Sensitivity Map - Slice A



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Phase 3, Thurnscoe, ROTHERHAM, S63 0PQ

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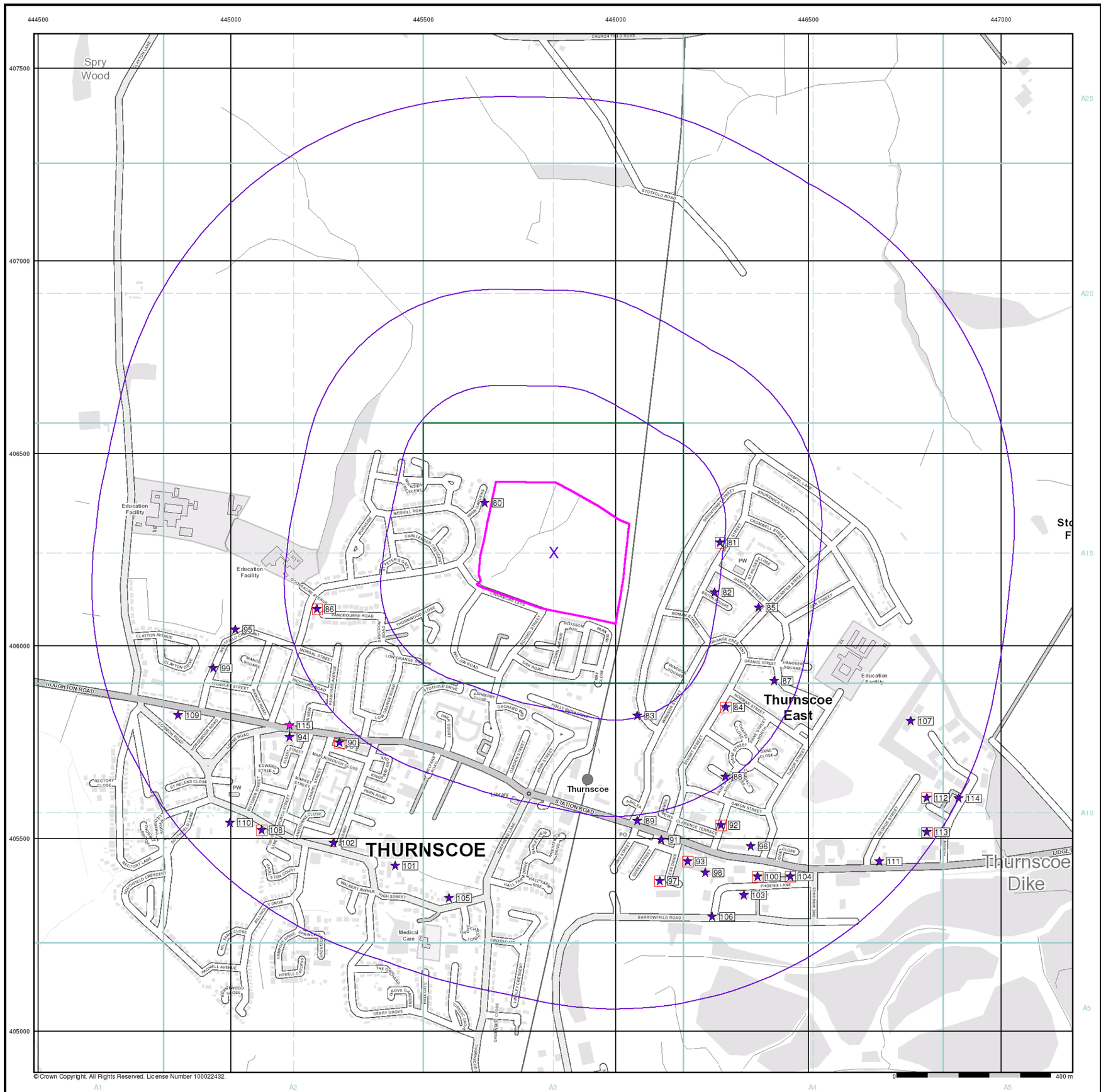


Industrial Land Use Map

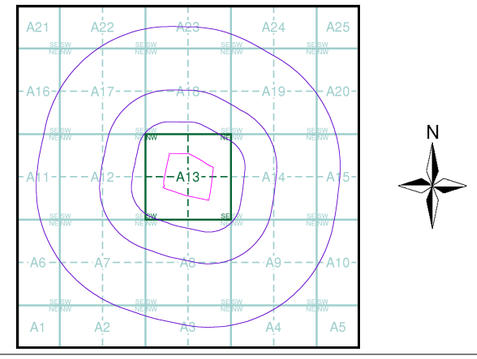
General

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

Industrial Land Use

- Contemporary Trade Directory Entry
- Fuel Station Entry
- Gas Pipeline
- Underground Electrical Cables

Industrial Land Use Map - Slice A



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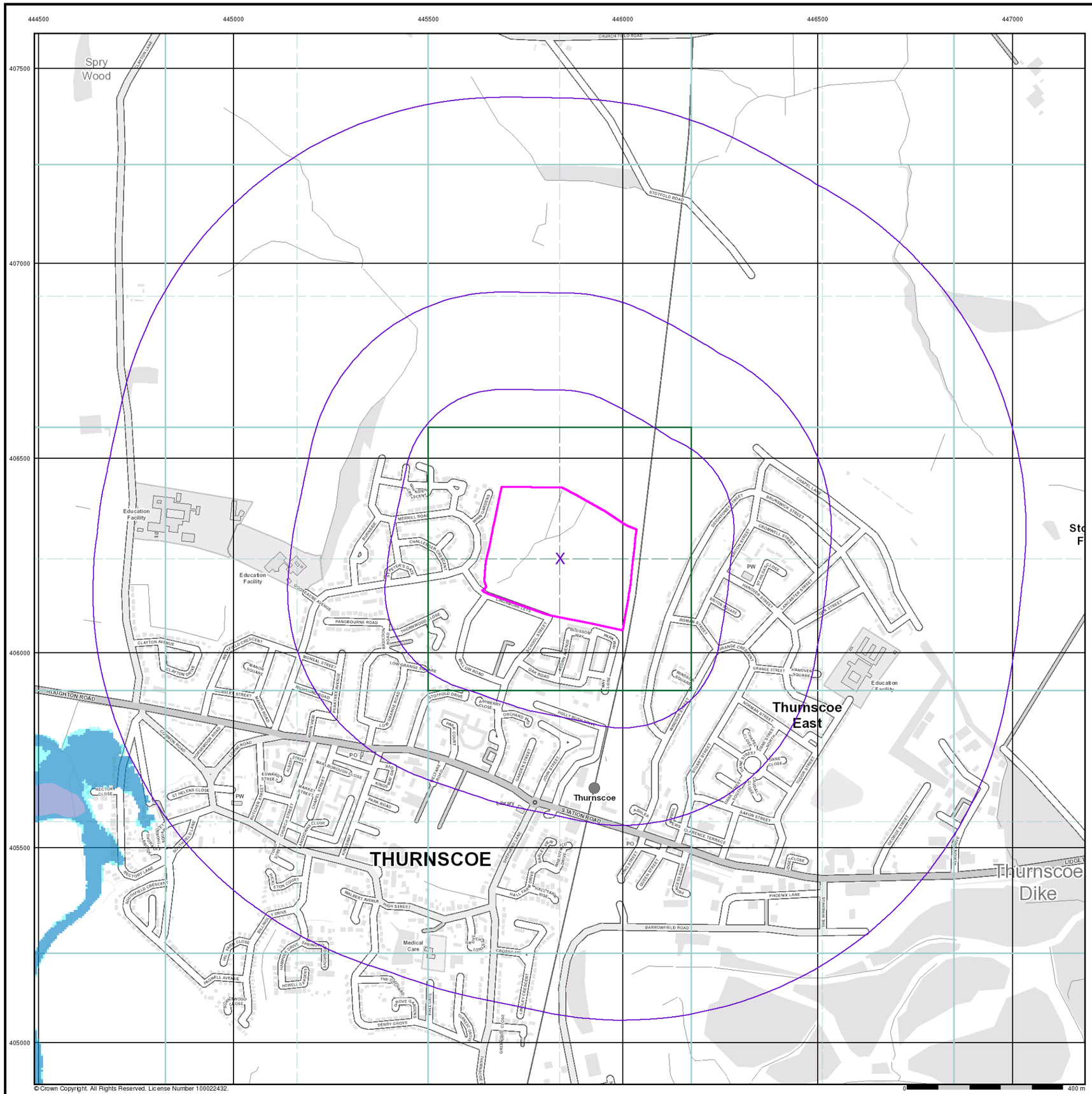


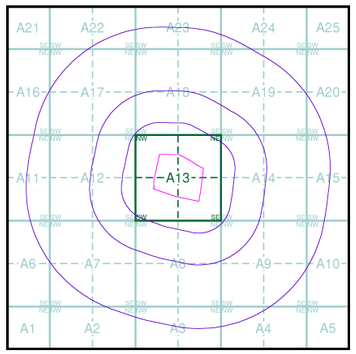
General

- Specified Site
- Specified Buffer(s)
- 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



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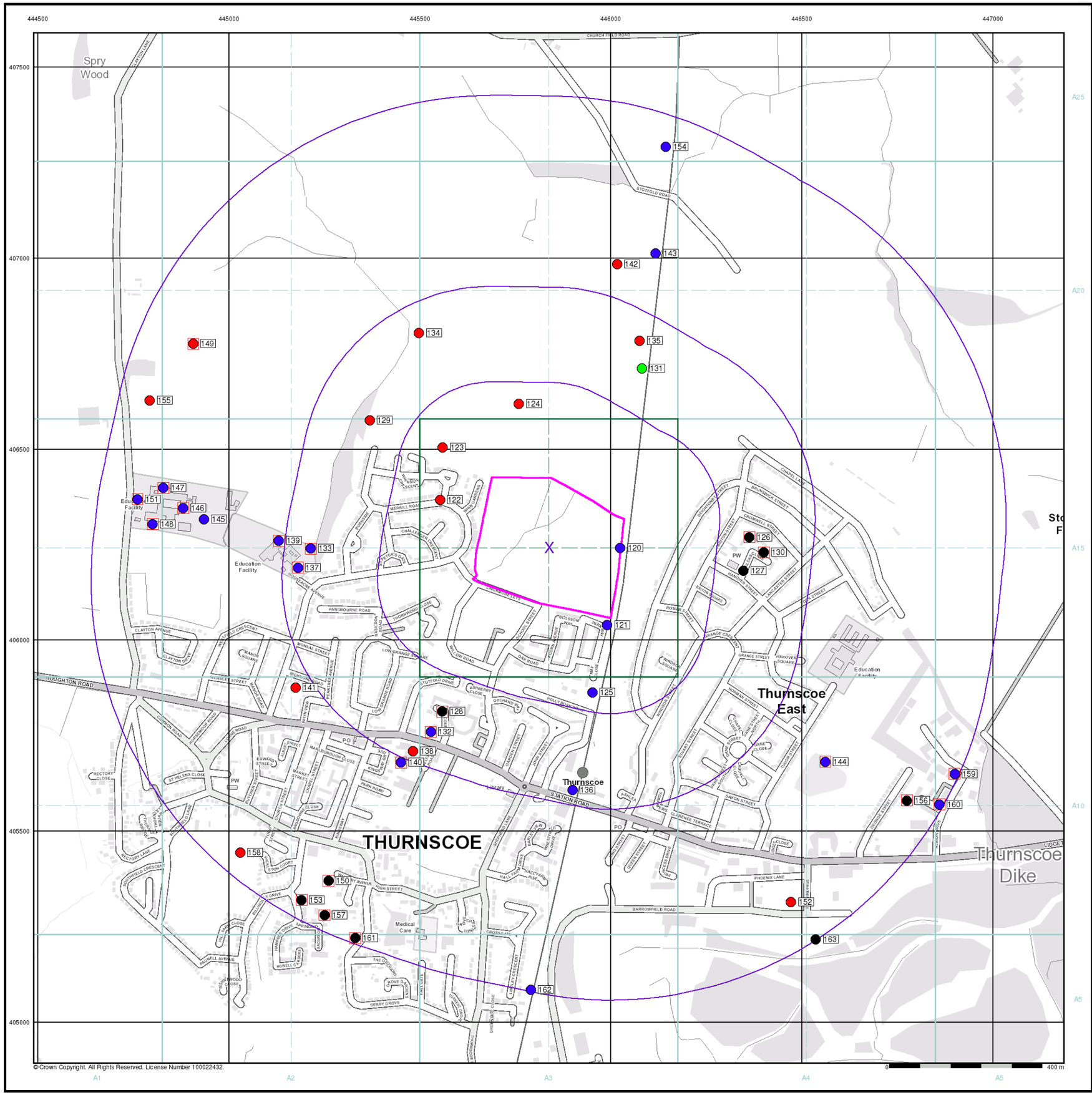

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General

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

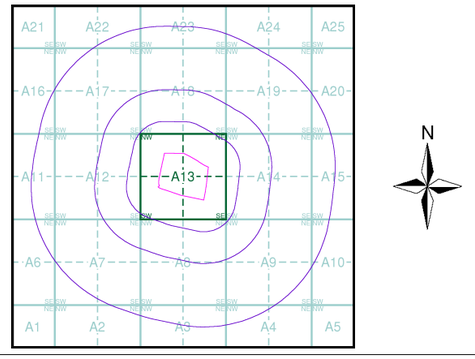
Agency and Hydrological (Boreholes)

- BGS Borehole Depth 0 - 10m
- BGS Borehole Depth 10 - 30m
- BGS Borehole Depth 30m +
- Confidential
- Other

For Borehole information please refer to the Borehole .csv file which accompanied this slice.

A copy of the BGS Borehole Ordering Form is available to download from the Support section of www.envirocheck.co.uk.

Borehole Map - Slice A



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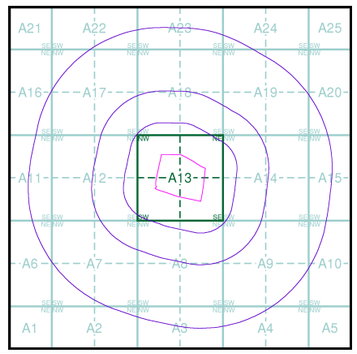
General

- 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

OS Water Network Map - Slice A



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Historical Mapping Legends

Ordnance Survey County Series 1:10,560

Gravel Pit
Sand Pit
Other Pits
Quarry
Shingle
Orchard
Osiers
Reeds
Marsh
Mixed Wood
Deciduous
Brushwood
Fir
Furze
Rough Pasture
Arrow denotes flow of water
Trigonometrical Station
Site of Antiquities
Bench Mark
Pump, Guide Post, Signal Post
Well, Spring, Boundary Post
·285 Surface Level
Sketched Contour
Instrumental Contour
Main Roads
Fenced
Un-Fenced
Minor Roads
Fenced
Un-Fenced
Sunken Road
Raised Road
Road over Railway
Railway over River
Railway over Road
Level Crossing
Road over River or Canal
Road over Stream
Road over Stream
County Boundary (Geographical)
County & Civil Parish Boundary
Administrative County & Civil Parish Boundary
Co. Boro. Bdy. County Borough Boundary (England)
Co. Burgh Bdy. County Burgh Boundary (Scotland)
R.D. Bdy. Rural District Boundary
Civil Parish Boundary

Ordnance Survey Plan 1:10,000

Chalk Pit, Clay Pit or Quarry
Gravel Pit
Sand Pit
Disused Pit or Quarry
Refuse or Slag Heap
Lake, Loch or Pond
Dunes
Boulders
Coniferous Trees
Non-Coniferous Trees
Orchard
Scrub
Coppice
Bracken
Heath
Rough Grassland
Marsh
Reeds
Saltings
Building
Direction of Flow of Water
Shingle
Sand
Glasshouse
Pylon
Electricity Transmission Line
Pole
Sloping Masonry
Cutting
Embankment
Standard Gauge Multiple Track
Road Under
Road Over
Level Crossing
Foot Bridge
Standard Gauge Single Track
Siding, Tramway or Mineral Line
Narrow Gauge
Geographical County
Administrative County, County Borough or County of City
Municipal Borough, Urban or Rural District, Burgh or District Council
Borough, Burgh or County Constituency
Shown only when not coincident with other boundaries
Civil Parish
Shown alternately when coincidence of boundaries occurs

BP, BS	Boundary Post or Stone	Pol Sta	Police Station
Ch	Church	PO	Post Office
CH	Club House	PC	Public Convenience
F E Sta	Fire Engine Station	PH	Public House
FB	Foot Bridge	SB	Signal Box
Fn	Fountain	Spr	Spring
GP	Guide Post	TCB	Telephone Call Box
MP	Mile Post	TCP	Telephone Call Post
MS	Mile Stone	W	Well

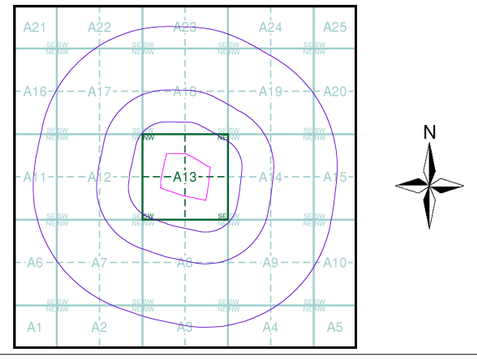
1:10,000 Raster Mapping

Gravel Pit
Refuse tip or slag heap
Rock
Rock (scattered)
Boulders
Boulders (scattered)
Shingle
Mud
Sand
Sand Pit
Slopes
Top of cliff
General detail
Underground detail
Overhead detail
Narrow gauge railway
Multi-track railway
Single track railway
County boundary (England only)
Civil, parish or community boundary
District, Unitary, Metropolitan, London Borough boundary
Constituency boundary
Area of wooded vegetation
Non-coniferous trees
Non-coniferous trees (scattered)
Coniferous trees
Coniferous trees (scattered)
Positioned tree
Orchard
Coppice or Osiers
Rough Grassland
Heath
Scrub
Marsh, Salt Marsh or Reeds
Water feature
Flow arrows
MHW(S) Mean high water (springs)
MLW(S) Mean low water (springs)
Telephone line (where shown)
Electricity transmission line (with poles)
BM 123.45 m Bench mark (where shown)
Triangulation station
Point feature (e.g. Guide Post or Mile Stone)
Pylon, flare stack or lighting tower
Site of (antiquity)
Glasshouse
General Building
Important Building

Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Yorkshire	1:10,560	1851 - 1854	2
Yorkshire	1:10,560	1893	3
Yorkshire	1:10,560	1894	4
Yorkshire	1:10,560	1906 - 1907	5
Yorkshire	1:10,560	1931 - 1932	6
Yorkshire	1:10,560	1938 - 1948	7
Yorkshire	1:10,560	1948	8
Ordnance Survey Plan	1:10,000	1955 - 1956	9
Ordnance Survey Plan	1:10,000	1966 - 1967	10
Ordnance Survey Plan	1:10,000	1976	11
Ordnance Survey Plan	1:10,000	1980 - 1988	12
Ordnance Survey Plan	1:10,000	1989	13
Ordnance Survey Plan	1:10,000	1991	14
10K Raster Mapping	1:10,000	2000	15
Street View	Variable		16

Historical Map - Slice A



Order Details

Order Number: 178227804_1_1
Customer Ref: C8023
National Grid Reference: 445840, 406240
Slice: A
Site Area (Ha): 10.93
Search Buffer (m): 1000

Site Details

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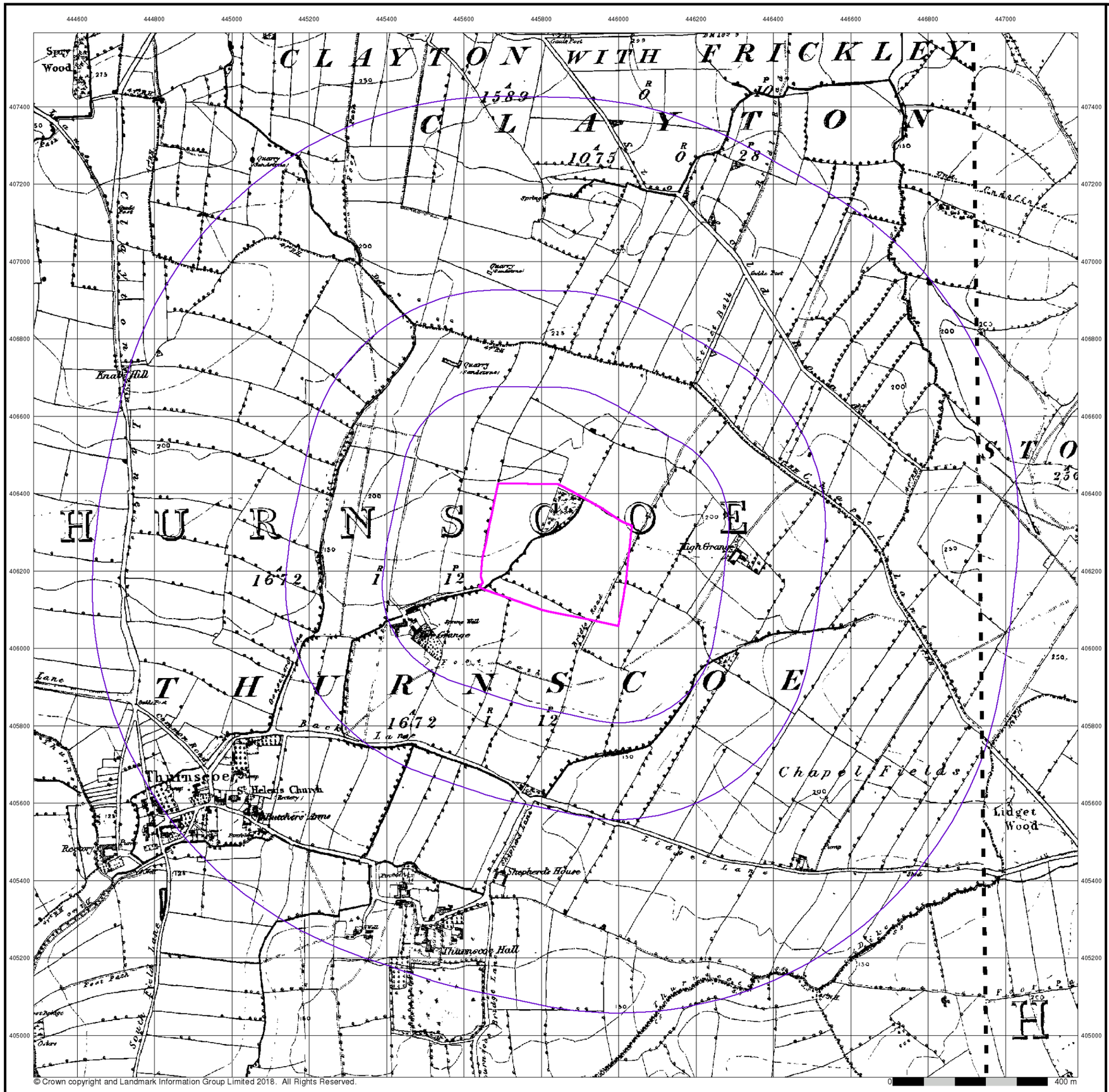

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Yorkshire

Published 1851 - 1854

Source map scale - 1:10,560

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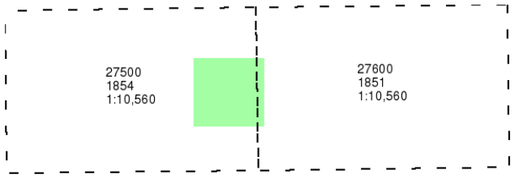
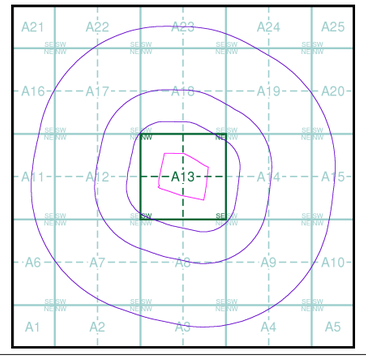
Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

Order Number:	178227804_1_1
Customer Ref:	C8023
National Grid Reference:	445840, 406240
Slice:	A
Site Area (Ha):	10.93
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Site Details

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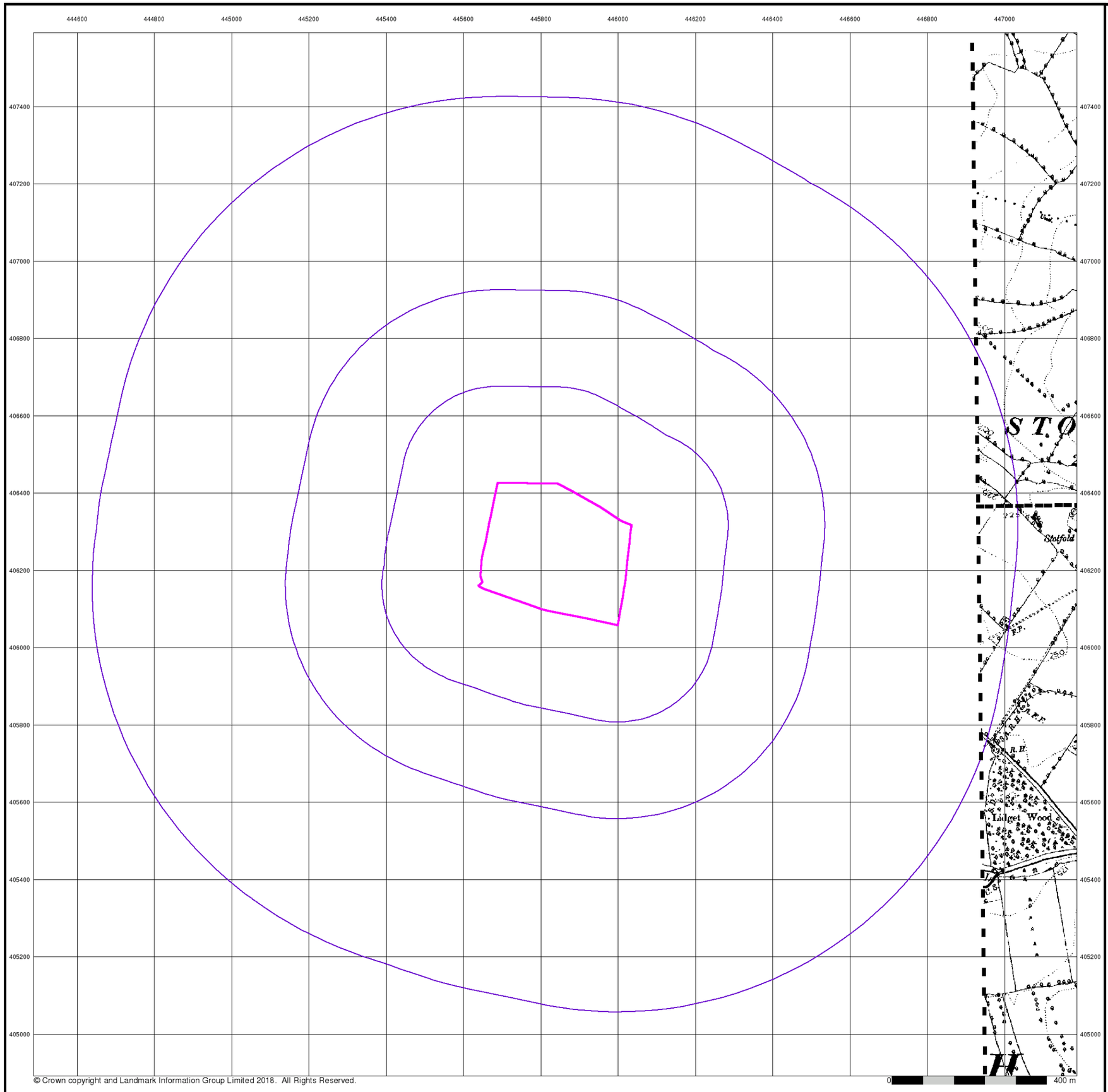

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Yorkshire

Published 1893

Source map scale - 1:10,560

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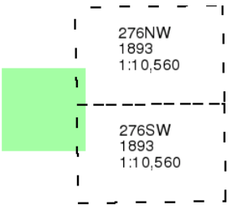
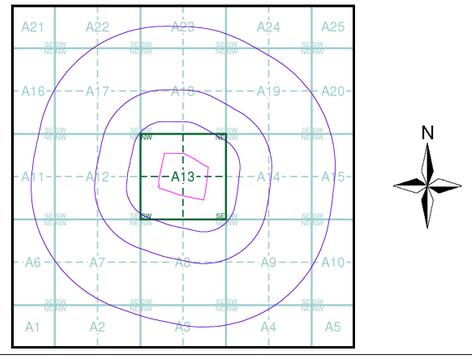
Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

Order Number:	178227804_1_1
Customer Ref:	C8023
National Grid Reference:	445840, 406240
Slice:	A
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Search Buffer (m):	1000

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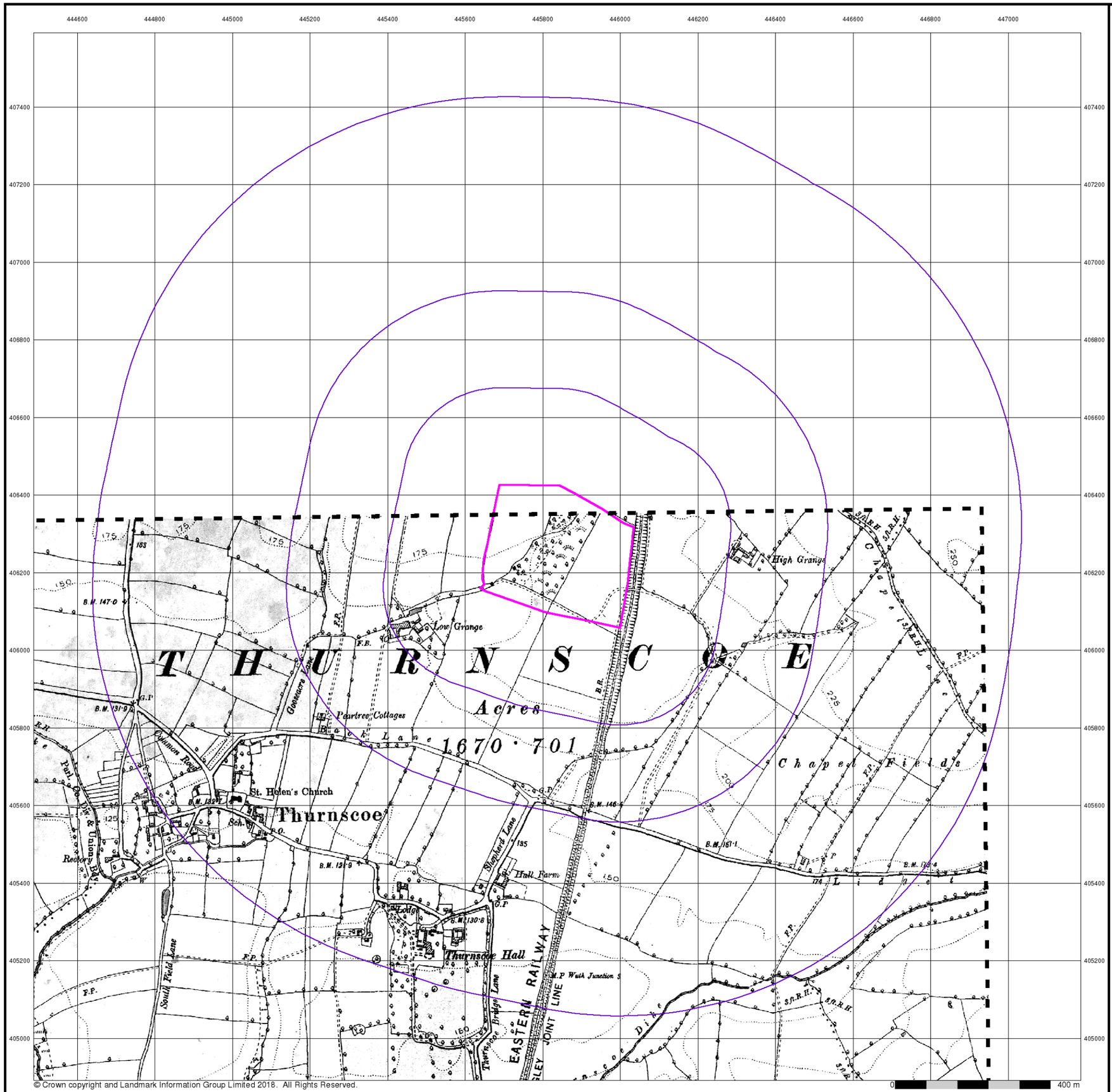

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Yorkshire

Published 1894

Source map scale - 1:10,560

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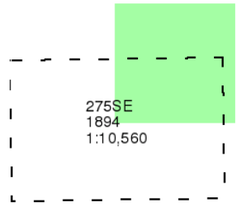
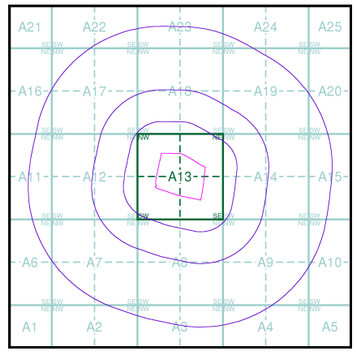
Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

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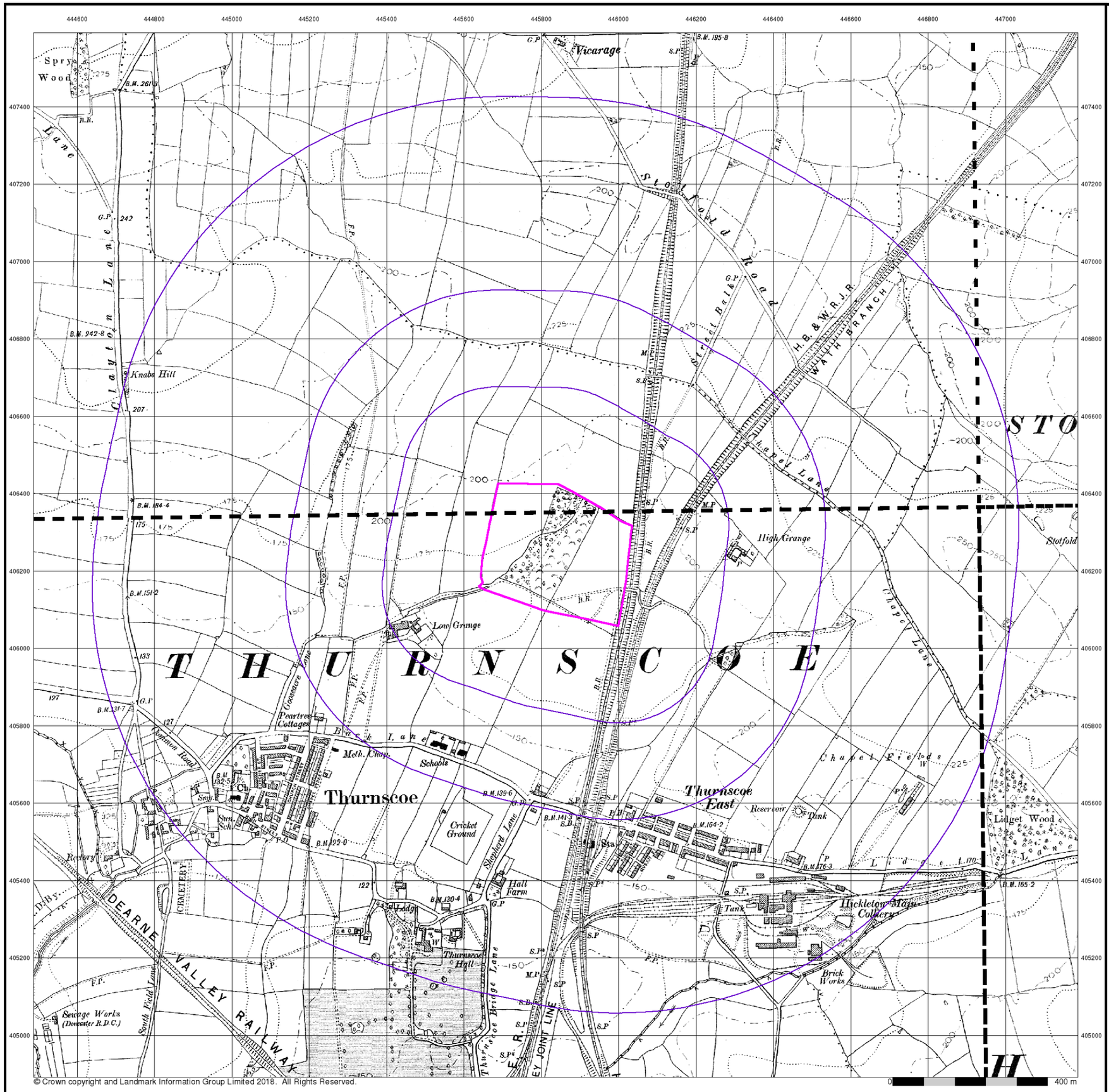

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Yorkshire

Published 1906 - 1907

Source map scale - 1:10,560

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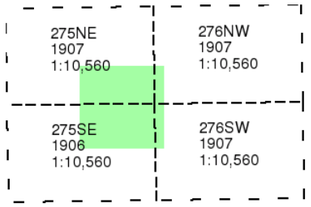
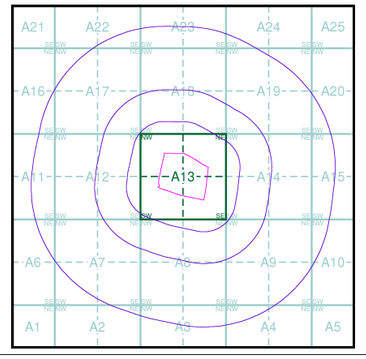
Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

Order Number:	178227804_1_1
Customer Ref:	C8023
National Grid Reference:	445840, 406240
Slice:	A
Site Area (Ha):	10.93
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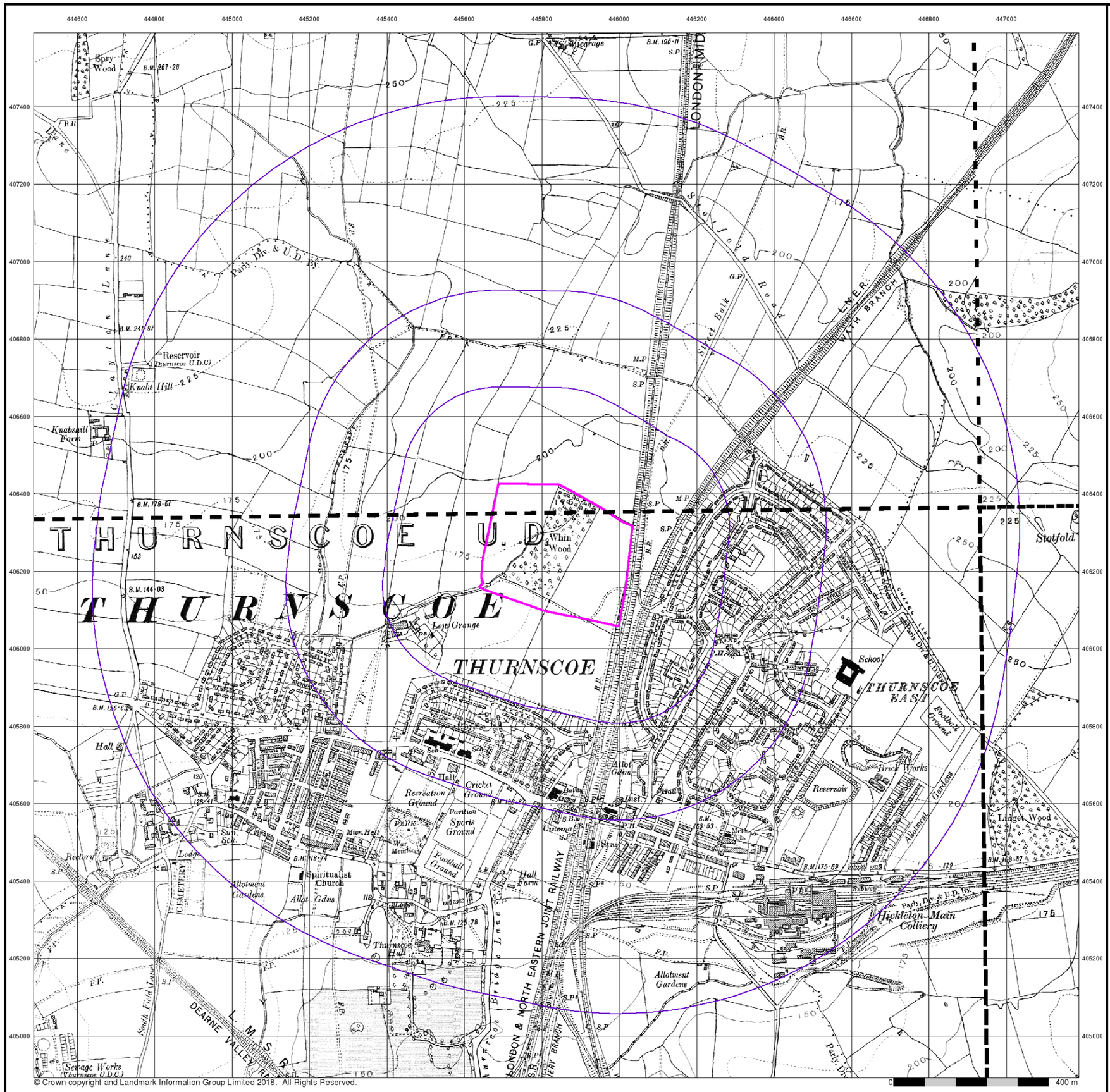

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Yorkshire

Published 1931 - 1932

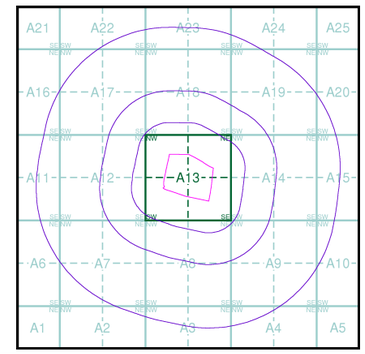
Source map scale - 1:10,560

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)

275NE 1932 1:10,560	276NW 1931 1:10,560
275SE 1931 1:10,560	276SW 1932 1:10,560

Historical Map - Slice A



Order Details

Order Number:	178227804_1_1
Customer Ref:	C8023
National Grid Reference:	445840, 406240
Slice:	A
Site Area (Ha):	10.93
Search Buffer (m):	1000

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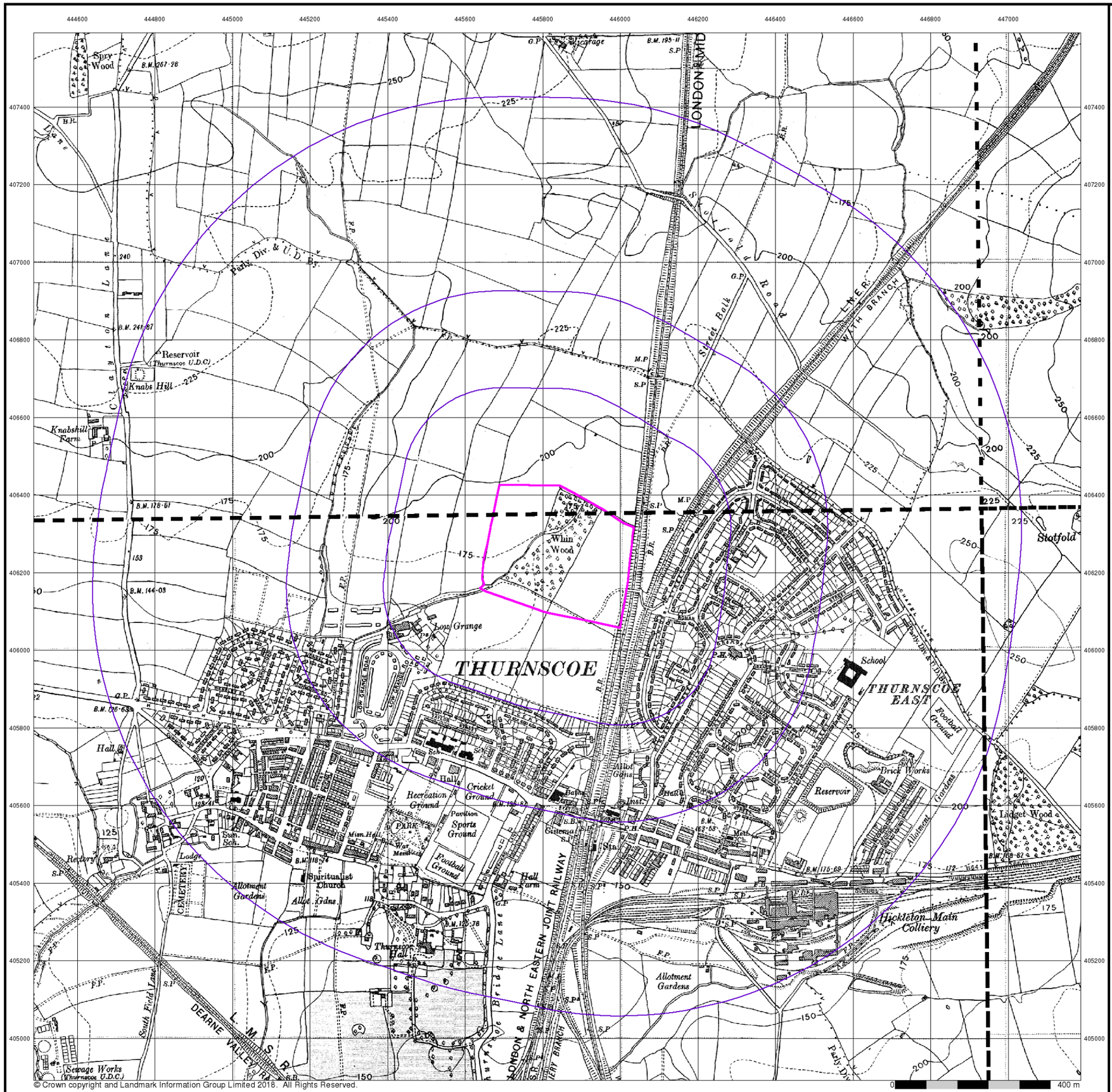

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Yorkshire

Published 1938 - 1948

Source map scale - 1:10,560

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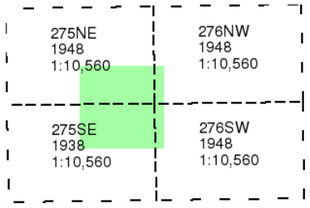
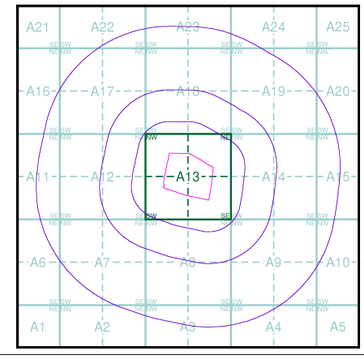
Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

Order Number:	178227804_1_1
Customer Ref:	C8023
National Grid Reference:	445840, 406240
Slice:	A
Site Area (Ha):	10.93
Search Buffer (m):	1000

Site Details

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Yorkshire

Published 1948

Source map scale - 1:10,560

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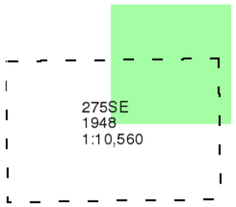
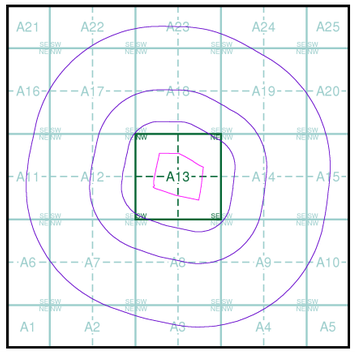
Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

Order Number:	178227804_1_1
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Site Details

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Ordnance Survey Plan

Published 1955 - 1956

Source map scale - 1:10,000

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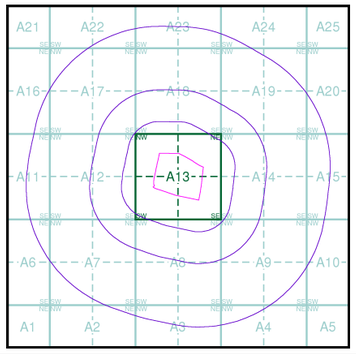
Map Name(s) and Date(s)

SE40NW 1955 1:10,560	SE40NE 1956 1:10,560
SE40SW 1956 1:10,560	SE40SE 1956 1:10,560

Historical Map - Slice A



Order Details

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National Grid Reference:	445840, 406240
Slice:	A
Site Area (Ha):	10.93
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Site Details

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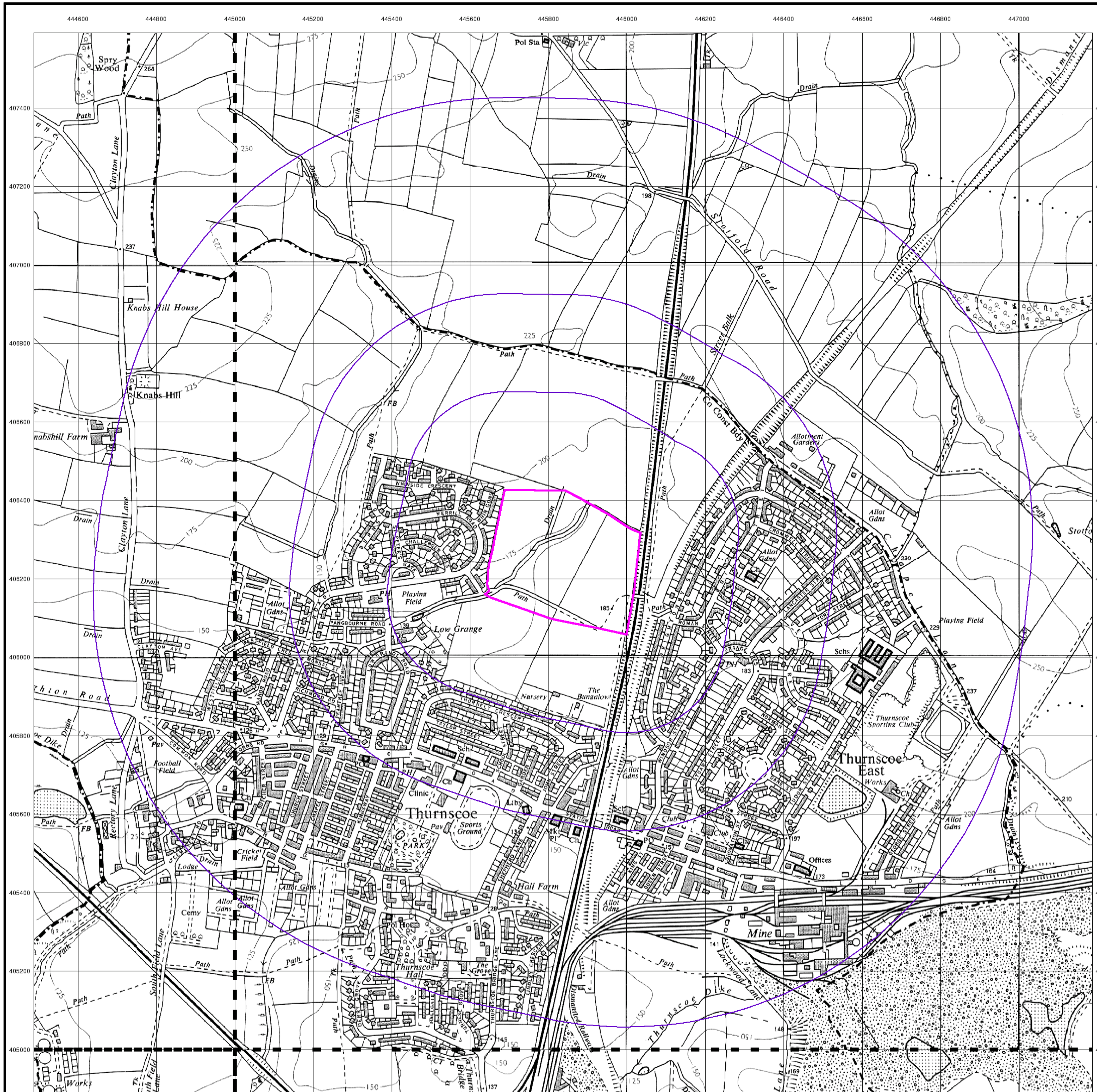

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0 400 m

Ordnance Survey Plan

Published 1966 - 1967

Source map scale - 1:10,000

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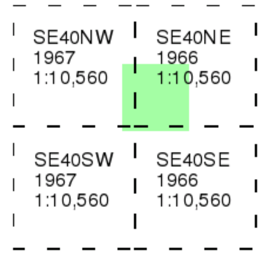
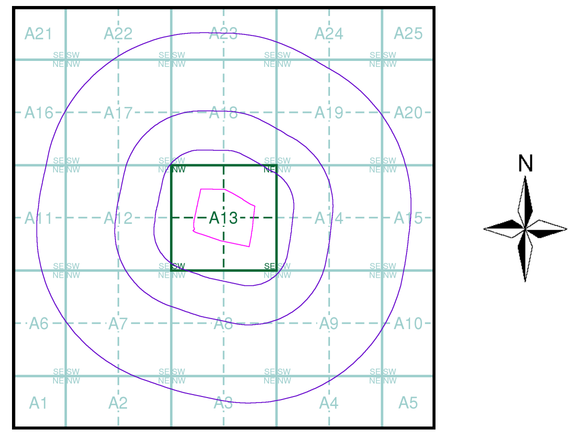
Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

Order Number: 178227804_1_1
Customer Ref: C8023
National Grid Reference: 445840, 406240
Slice: A
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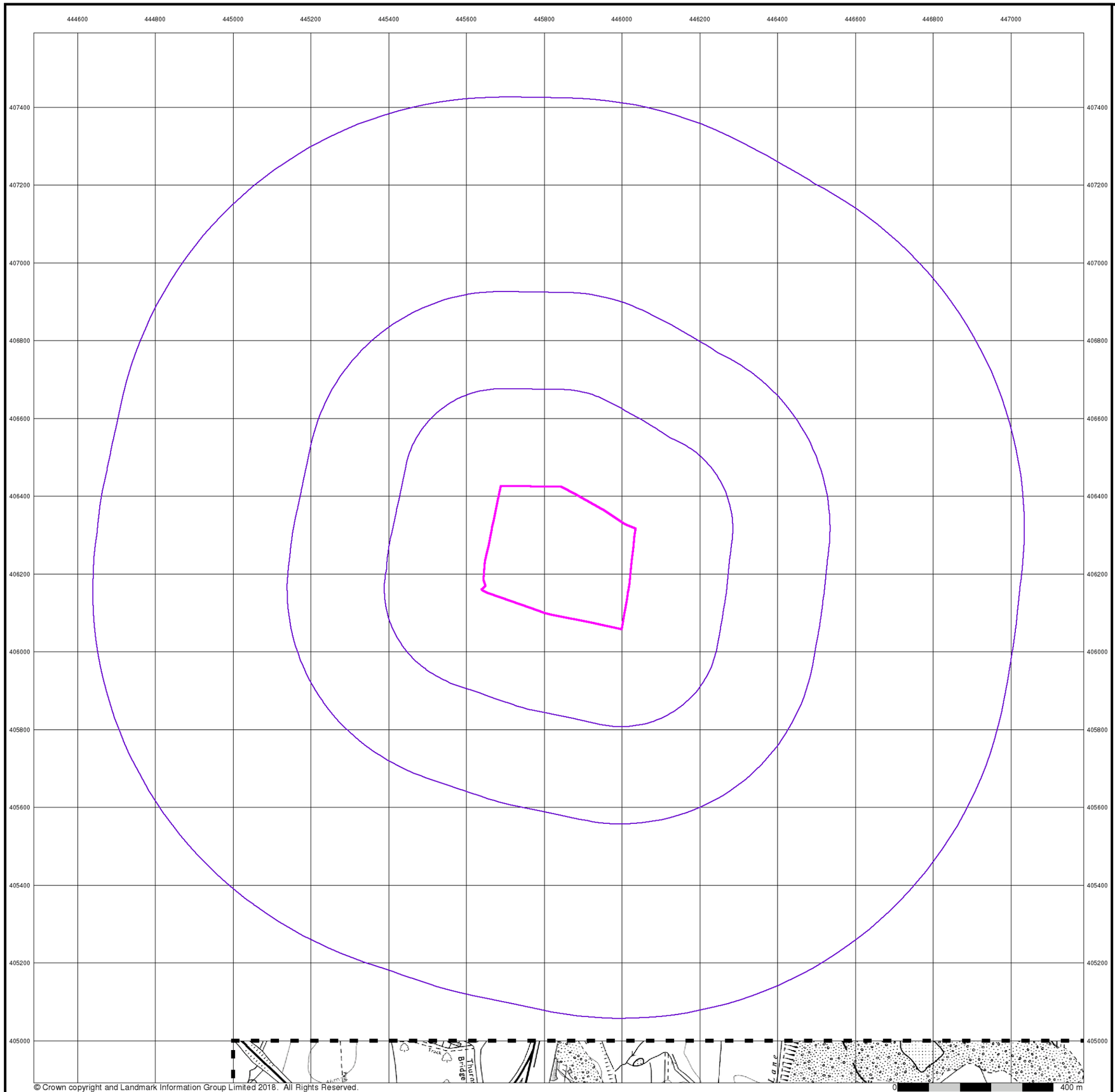

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Ordnance Survey Plan

Published 1976

Source map scale - 1:10,000

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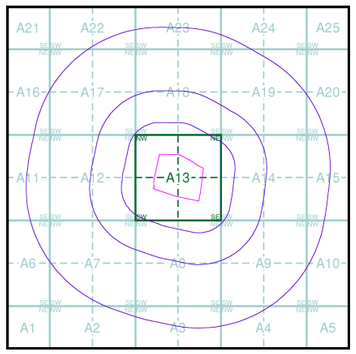
Map Name(s) and Date(s)

SE40SE
1976
1:10,000

Historical Map - Slice A



Order Details

Order Number:	178227804_1_1
Customer Ref:	C8023
National Grid Reference:	445840, 406240
Slice:	A
Site Area (Ha):	10.93
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Site Details

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Ordnance Survey Plan

Published 1980 - 1988

Source map scale - 1:10,000

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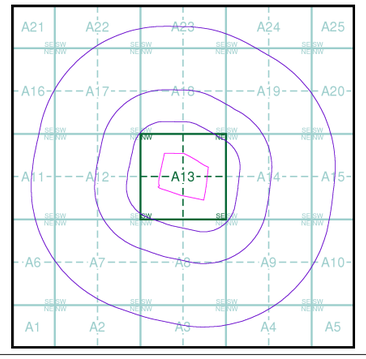
Map Name(s) and Date(s)

SE40NW 1983 1:10,000	SE40NE 1983 1:10,000
SE40SW 1980 1:10,000	SE40SE 1988 1:10,000

Historical Map - Slice A



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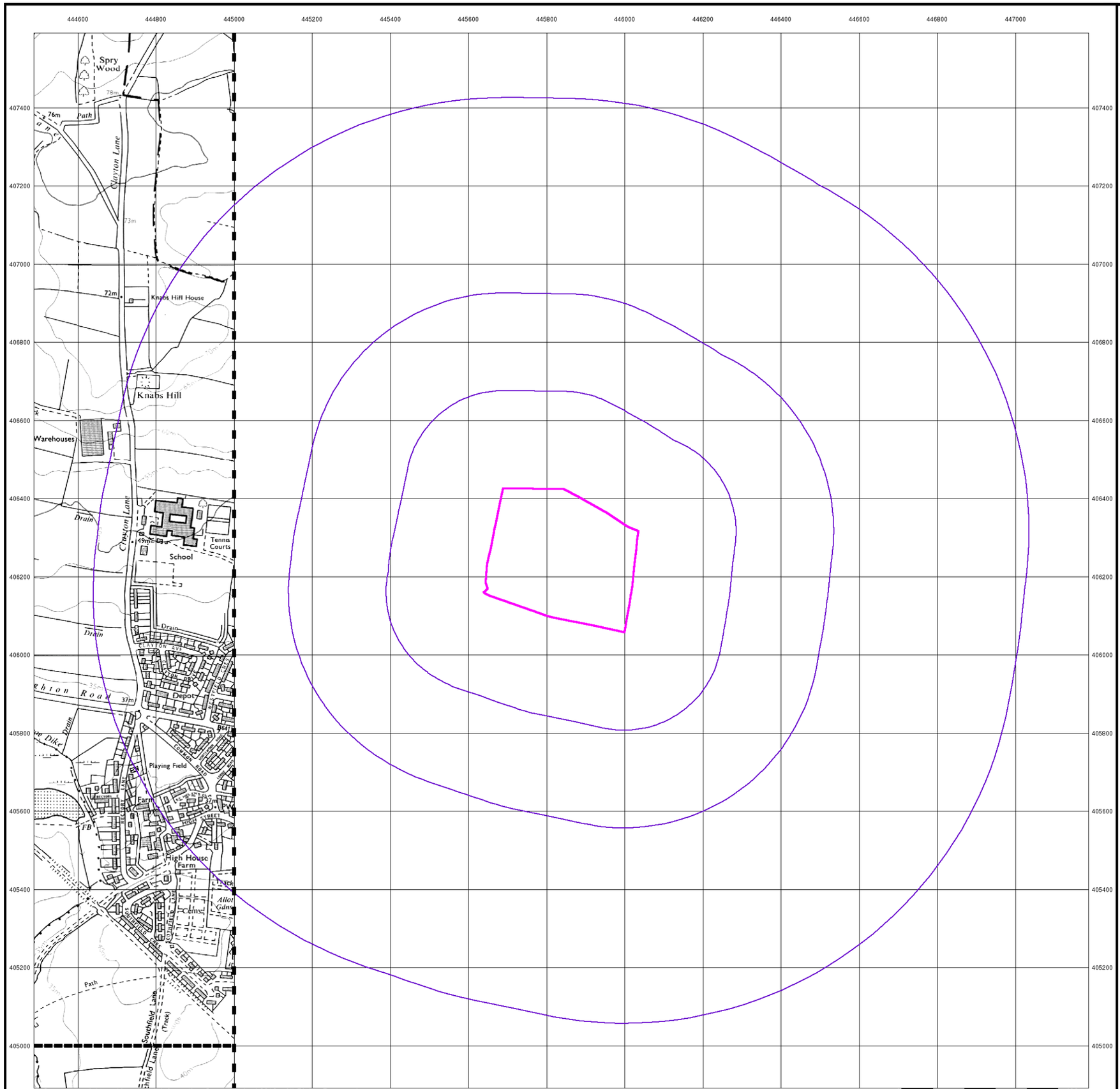


Ordnance Survey Plan

Published 1989

Source map scale - 1:10,000

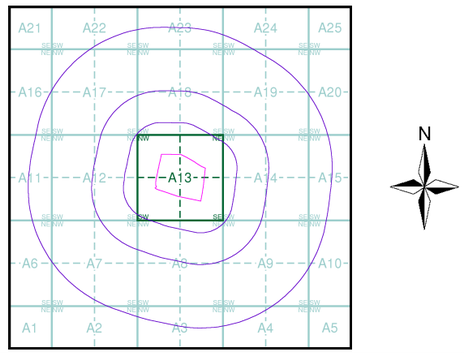
The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some 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)

SE40NW
1989
1:10,000

SE40SW
1989
1:10,000

Historical Map - Slice A



Order Details

Order Number:	178227804_1_1
Customer Ref:	C8023
National Grid Reference:	445840, 406240
Slice:	A
Site Area (Ha):	10.93
Search Buffer (m):	1000

Site Details

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Ordnance Survey Plan

Published 1991

Source map scale - 1:10,000

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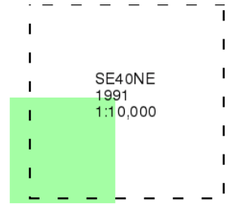
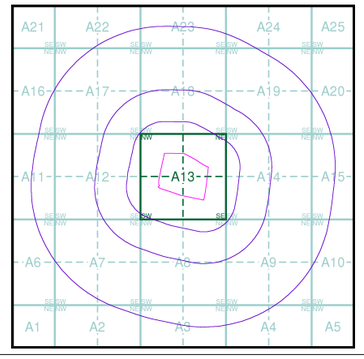
Map Name(s) and Date(s)



Historical Map - Slice A



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10k Raster Mapping

Published 2000

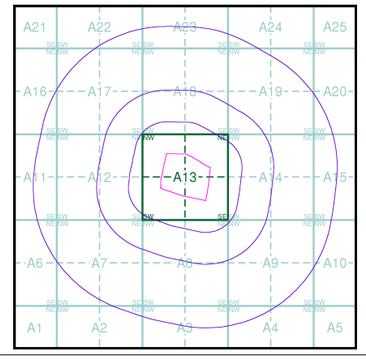
Source map scale - 1:10,000

The historical maps shown were produced from the Ordnance Survey`s 1:10,000 colour raster mapping. These maps are derived from Landplan which replaced the old 1:10,000 maps originally published in 1970. The data is highly detailed showing buildings, fences and field boundaries as well as all roads, tracks and paths. Road names are also included together with the relevant road number and classification. Boundary information depiction includes county, unitary authority, district, civil parish and constituency.

Map Name(s) and Date(s)

SE40NW 2000 1:10,000	SE40NE 2000 1:10,000
SE40SW 2000 1:10,000	SE40SE 2000 1:10,000

Historical Map - Slice A



Order Details

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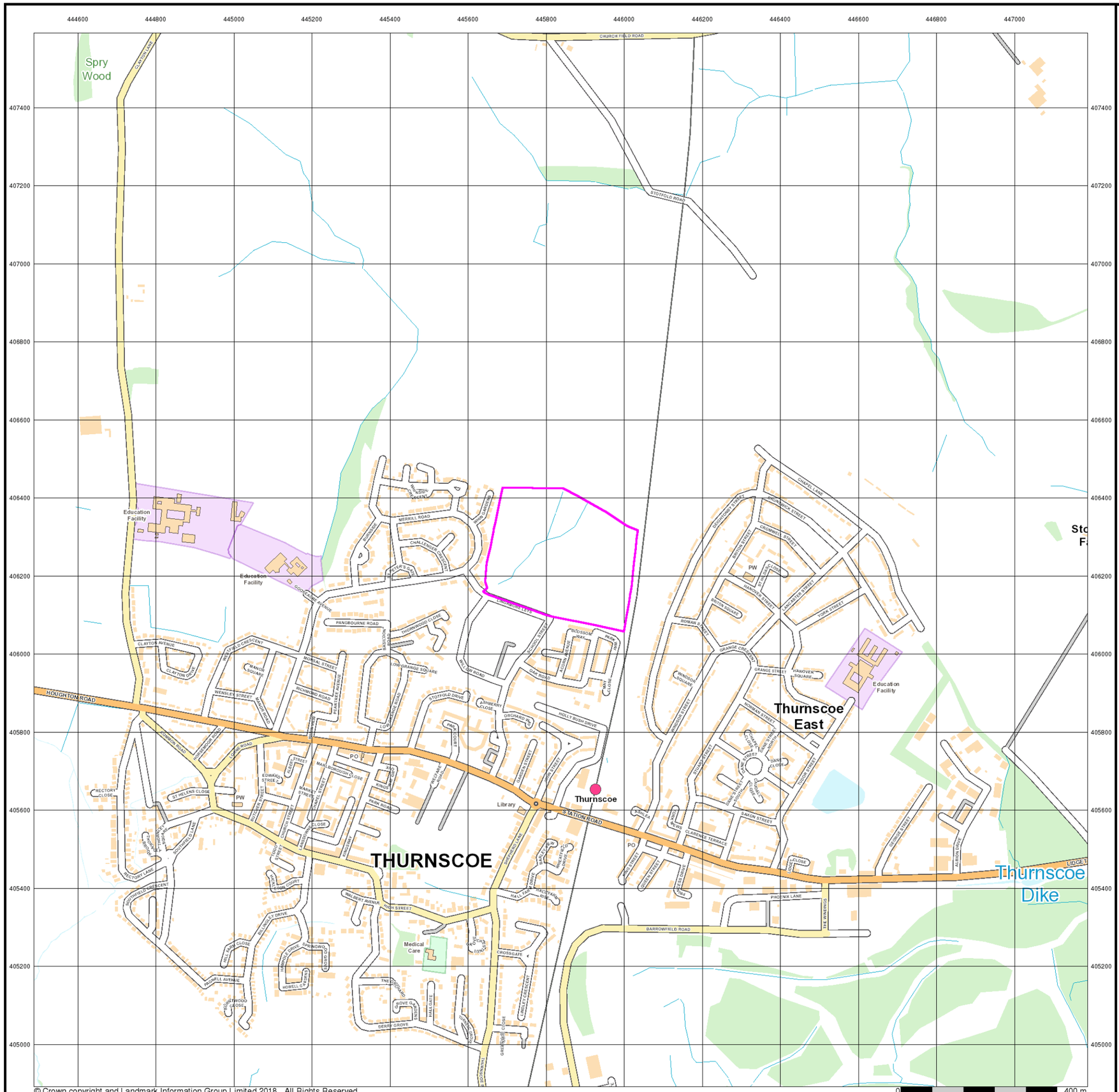


Street View

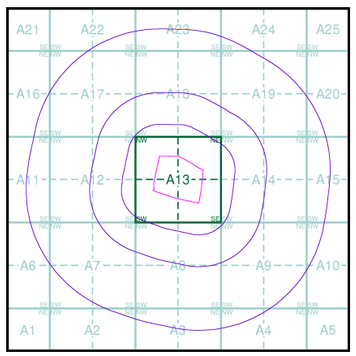
Published 2018

Source map scale - 1:10,000

Street View is a street-level map for the whole of Great Britain produced by the Ordnance Survey. These maps are provided at a nominal scale of 1:10,000

Map Name(s) and Date(s)

Street View Map - Slice A



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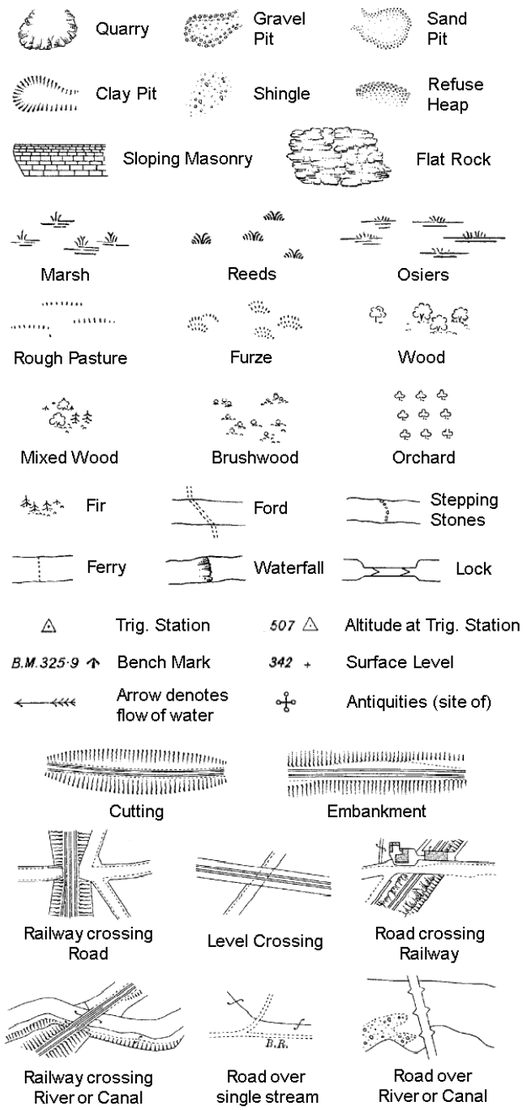
Historical Mapping Legends

Ordnance Survey County Series and Ordnance Survey Plan 1:2,500



County Boundary (Geographical)

County & Civil Parish Boundary

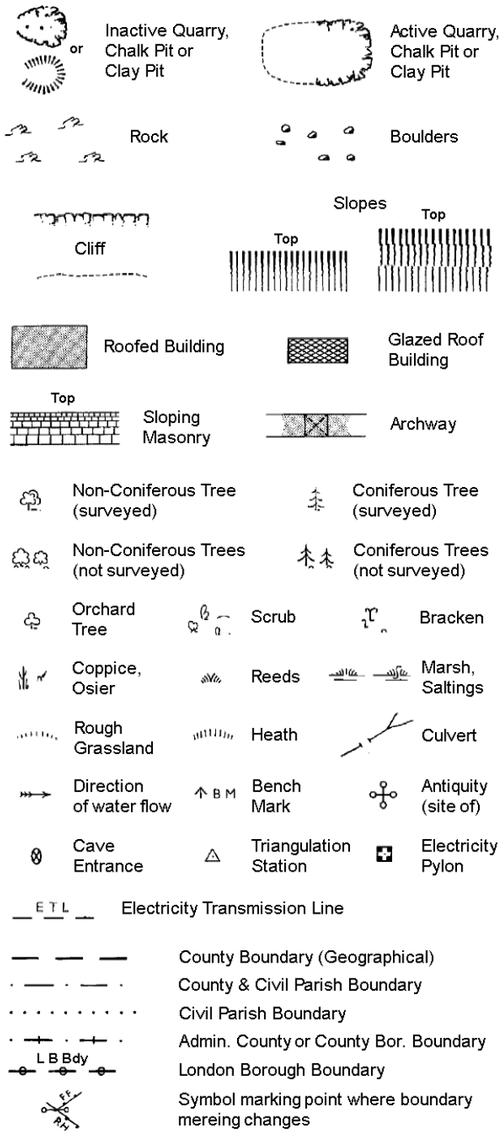
Administrative County & Civil Parish Boundary

Co. Boro. Bdy. County Borough Boundary (England)

Co. Burgh Bdy. County Burgh Boundary (Scotland)

B P B S	Boundary Post or Stone	P.C.B	Police Call Box
B.R.	Bridle Road	P	Pump
E.P	Electricity Pylon	S.P	Signal Post
F.B.	Foot Bridge	St.	Sluice
F.P.	Foot Path	Sp.	Spring
G.P	Guide Post or Board	T.C.B	Telephone Call Box
M.S	Mile Stone	Tr.	Trough
M.P M.R	Mooring Post or Ring	W	Well

Ordnance Survey Plan, Additional SIMs and Supply of Unpublished Survey Information 1:2,500 and 1:1,250



County Boundary (Geographical)

County & Civil Parish Boundary

Civil Parish Boundary

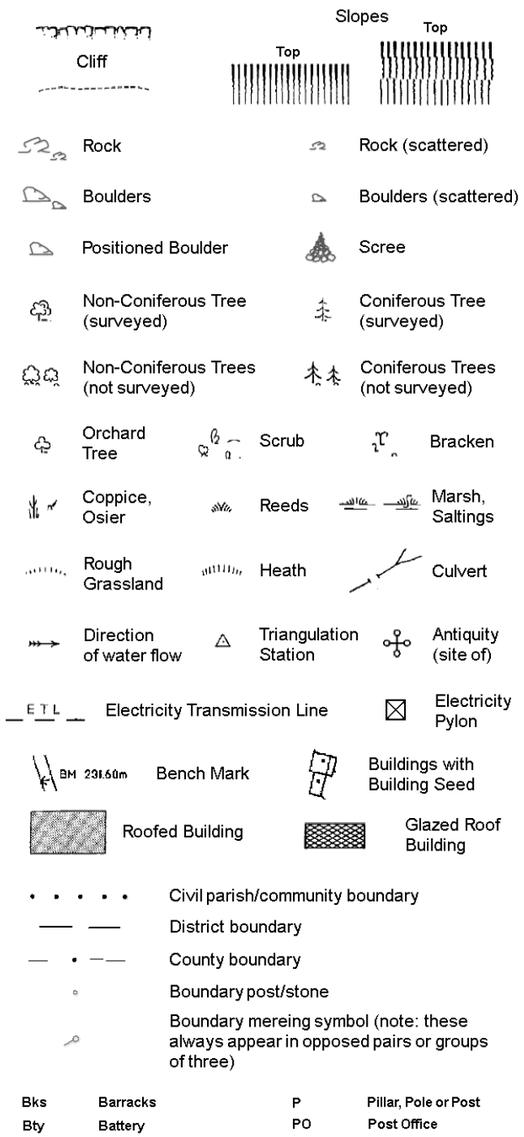
Admin. County or County Bor. Boundary

L B Bdy London Borough Boundary

Symbol marking point where boundary mereing changes

BH	Beer House	P	Pillar, Pole or Post
BP, BS	Boundary Post or Stone	PO	Post Office
Cn, C	Capstan, Crane	PC	Public Convenience
Chy	Chimney	PH	Public House
D Fn	Drinking Fountain	Pp	Pump
El P	Electricity Pillar or Post	SB, S Br	Signal Box or Bridge
FAP	Fire Alarm Pillar	SP, SL	Signal Post or Light
FB	Foot Bridge	Spr	Spring
GP	Guide Post	Tk	Tank or Track
H	Hydrant or Hydraulic	TCB	Telephone Call Box
LC	Level Crossing	TCP	Telephone Call Post
MH	Manhole	Tr	Trough
MP	Mile Post or Mooring Post	Wr Pt, Wr T	Water Point, Water Tap
MS	Mile Stone	W	Well
NTL	Normal Tidal Limit	Wd Pp	Wind Pump

Large-Scale National Grid Data 1:2,500 and 1:1,250



Civil parish/community boundary

District boundary

County boundary

Boundary post/stone

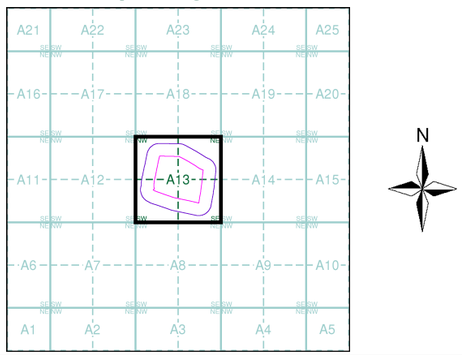
Boundary mereing symbol (note: these always appear in opposed pairs or groups of three)

Bks	Barracks	P	Pillar, Pole or Post
Bty	Battery	PO	Post Office
Cemy	Cemetery	PC	Public Convenience
Chy	Chimney	Pp	Pump
Cis	Cistern	Ppg Sta	Pumping Station
Dismtd Rly	Dismantled Railway	PW	Place of Worship
El Gen Sta	Electricity Generating Station	Sewage Ppg Sta	Sewage Pumping Station
El P	Electricity Pole, Pillar	SB, S Br	Signal Box or Bridge
El Sub Sta	Electricity Sub Station	SP, SL	Signal Post or Light
FB	Filter Bed	Spr	Spring
Fn / D Fn	Fountain / Drinking Ftn.	Tk	Tank or Track
Gas Gov	Gas Valve Compound	Tr	Trough
GVC	Gas Governer	Wd Pp	Wind Pump
GP	Guide Post	Wr Pt, Wr T	Water Point, Water Tap
MH	Manhole	Wks	Works (building or area)
MP, MS	Mile Post or Mile Stone	W	Well

Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Yorkshire	1:2,500	1892	2
Yorkshire	1:2,500	1906	3
Yorkshire	1:2,500	1930	4
Ordnance Survey Plan	1:1,250	1961 - 1962	5
Additional SIMs	1:1,250	1961 - 1988	6
Ordnance Survey Plan	1:2,500	1962	7
Ordnance Survey Plan	1:1,250	1970 - 1973	8
Additional SIMs	1:1,250	1982 - 1989	9
Large-Scale National Grid Data	1:1,250	1993	10
Large-Scale National Grid Data	1:1,250	1993 - 1994	11

Historical Map - Segment A13



Order Details

Order Number:	178227804_1_1
Customer Ref:	C8023
National Grid Reference:	445840, 406240
Slice:	A
Site Area (Ha):	10.93
Search Buffer (m):	100

Site Details

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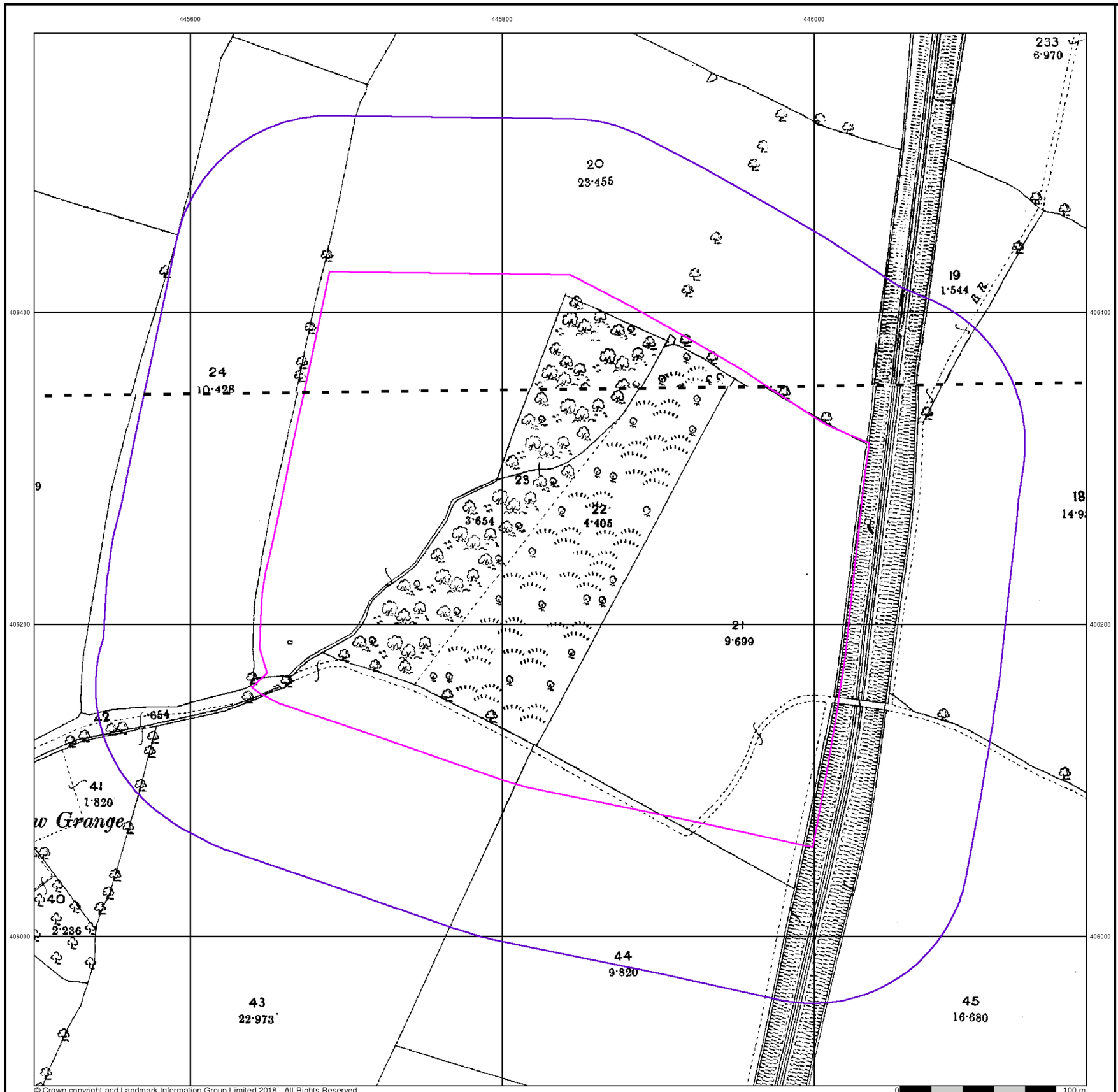

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Yorkshire

Published 1892

Source map scale - 1:2,500

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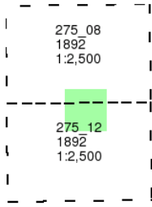
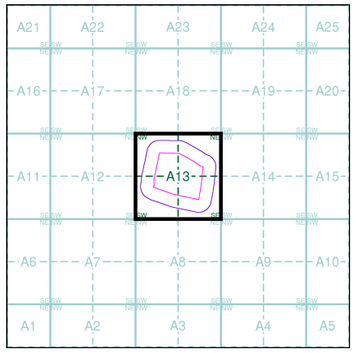
Map Name(s) and Date(s)



Historical Map - Segment A13



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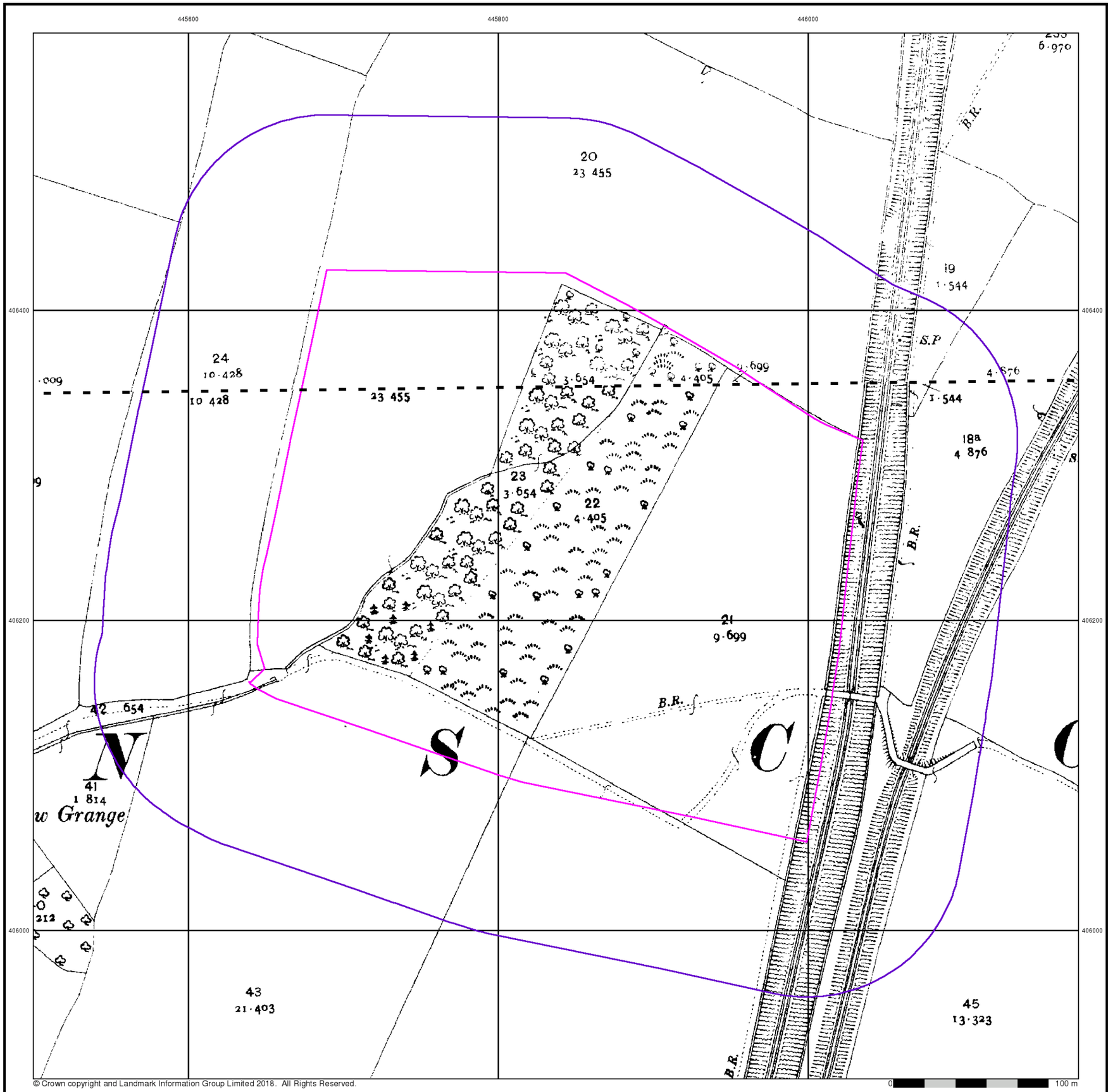

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Yorkshire

Published 1906

Source map scale - 1:2,500

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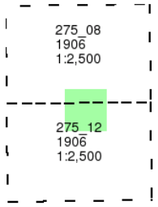
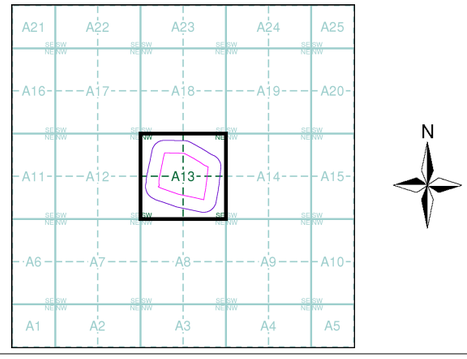
Map Name(s) and Date(s)



Historical Map - Segment A13



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Site Details

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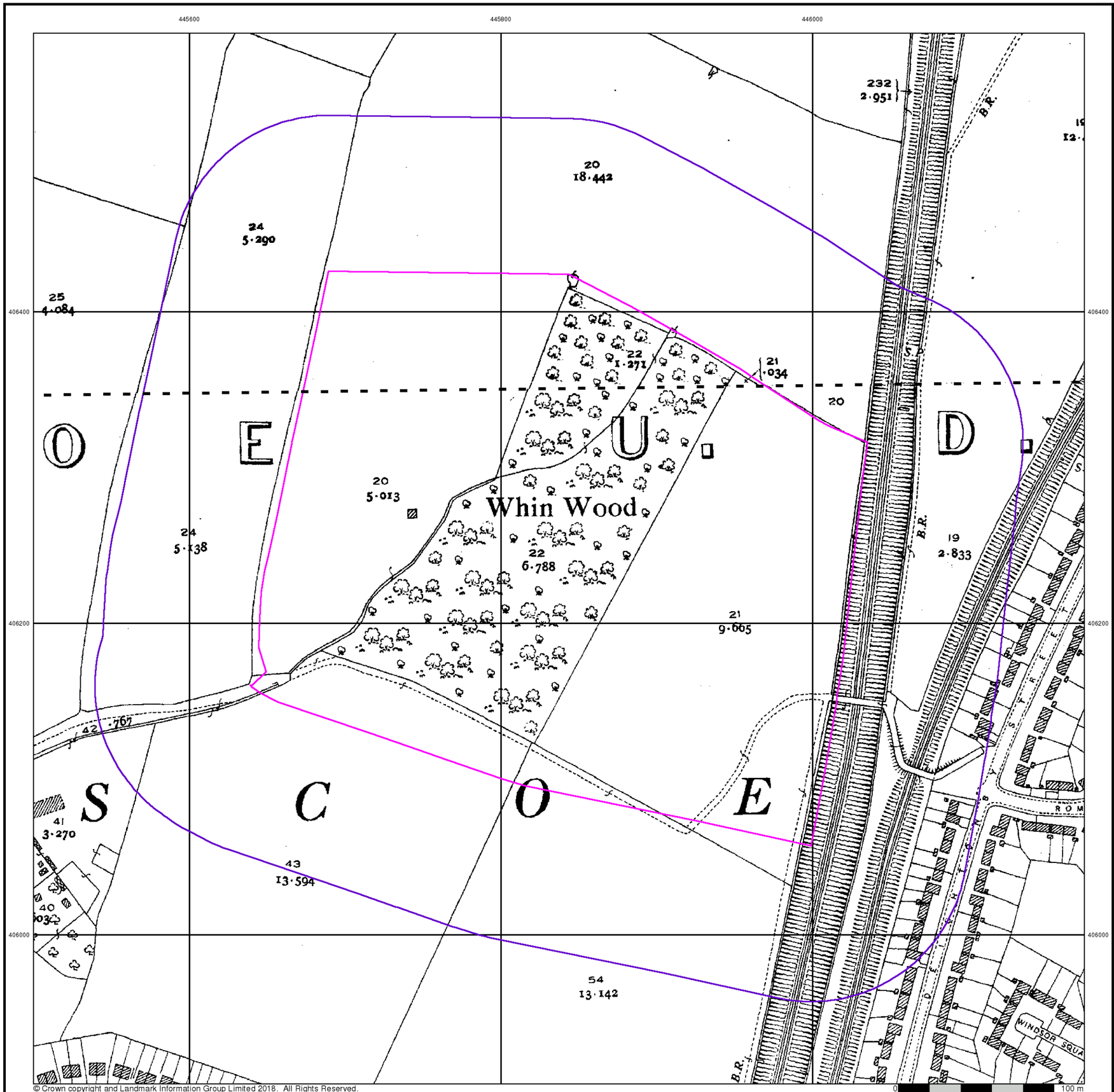

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Yorkshire

Published 1930

Source map scale - 1:2,500

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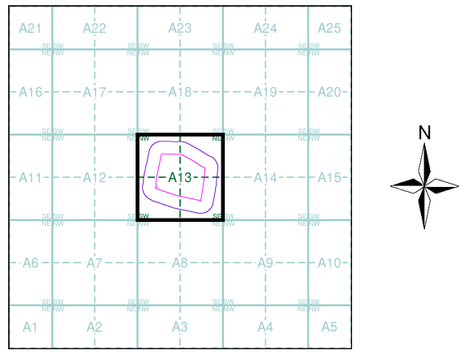
Map Name(s) and Date(s)

275_08
1930
1:2,500

275_12
1930
1:2,500

Historical Map - Segment A13



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Ordnance Survey Plan

Published 1961 - 1962

Source map scale - 1:1,250

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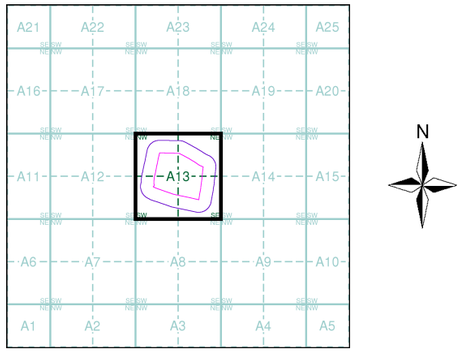
Map Name(s) and Date(s)

SE4506SW 1961 1:1,250	SE4506SE 1961 1:1,250	SE4606SW 1961 1:1,250
SE4505NW 1962 1:1,250	SE4505NE 1962 1:1,250	SE4605NW 1962 1:1,250

Historical Map - Segment A13



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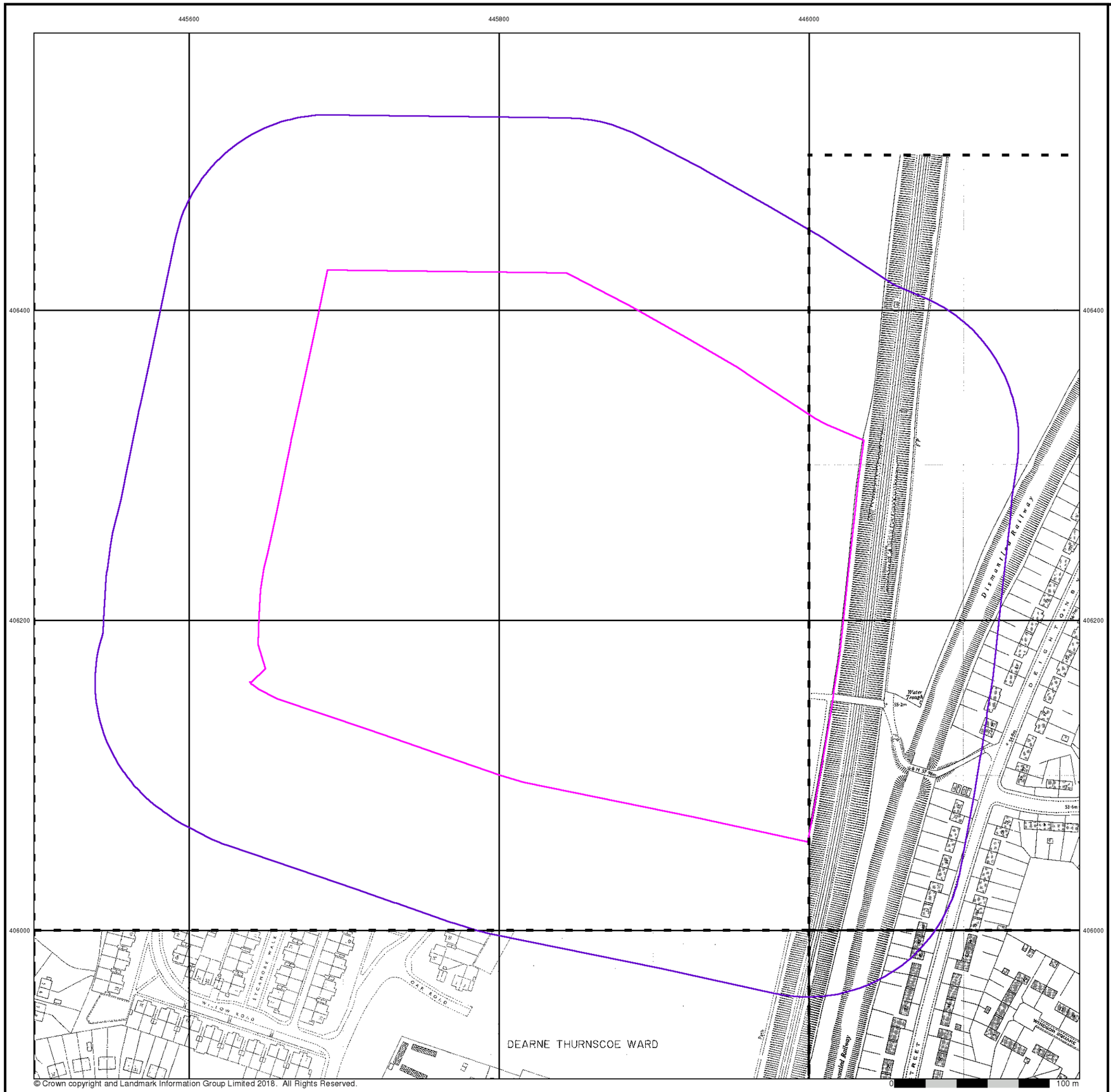

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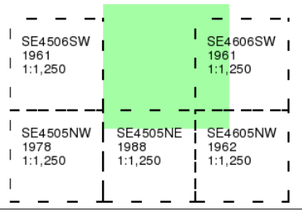
Additional SIMs

Published 1961 - 1988

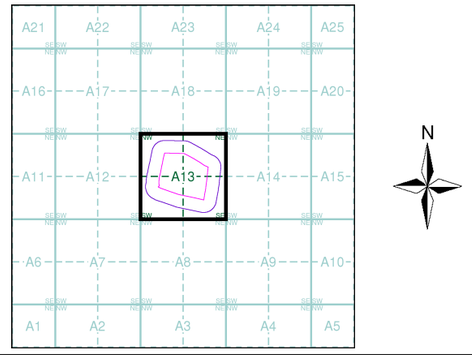
Source map scale - 1:1,250

The SIM cards (Ordnance Survey's `Survey of Information on Microfilm') are further, minor editions of mapping which were produced and published in between the main editions as an area was updated. They date from 1947 to 1994, and contain detailed information on buildings, roads and land-use. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)



Historical Map - Segment A13



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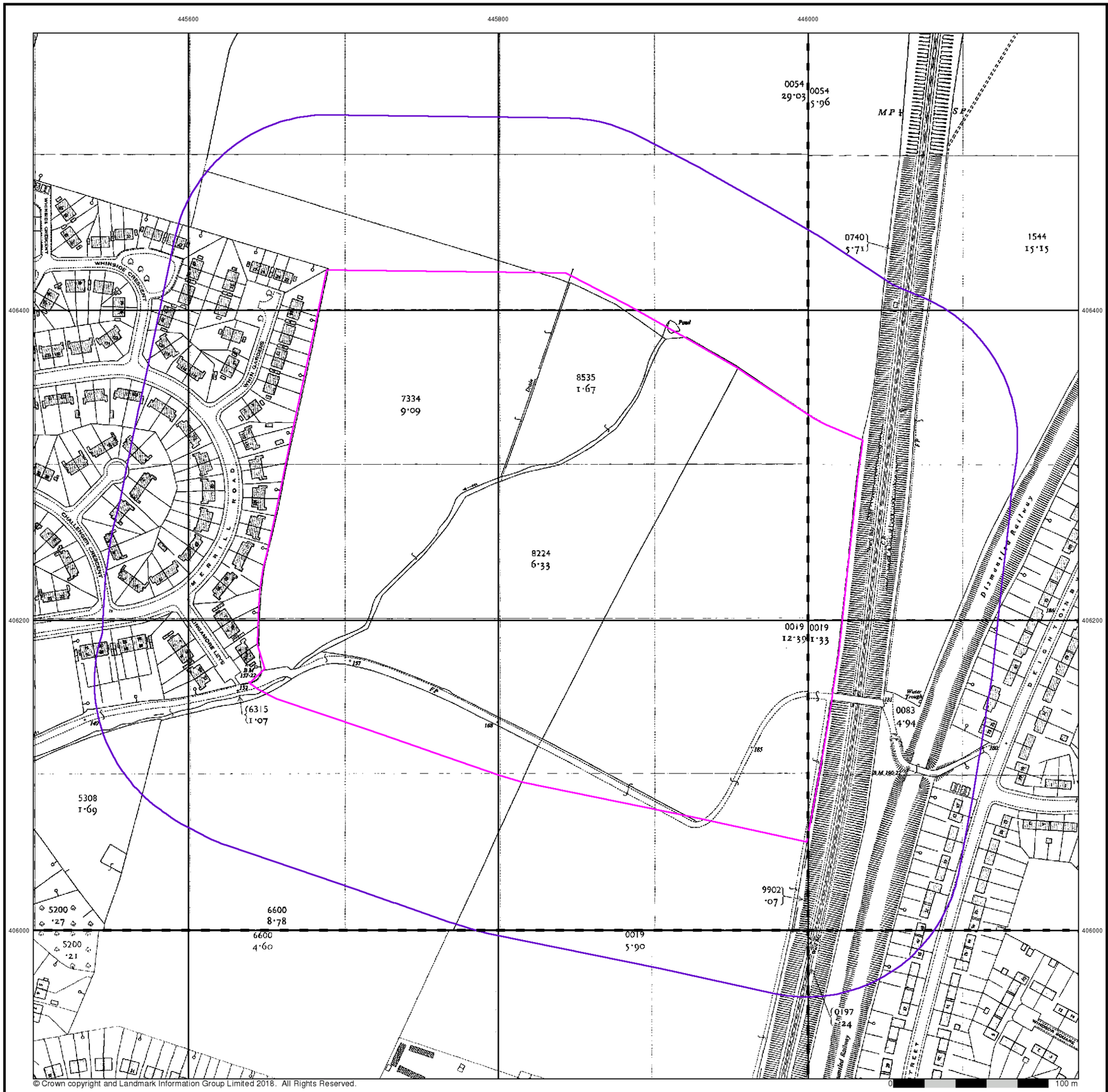

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Ordnance Survey Plan

Published 1962

Source map scale - 1:2,500

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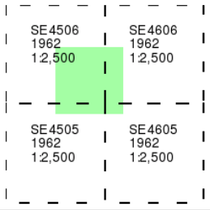
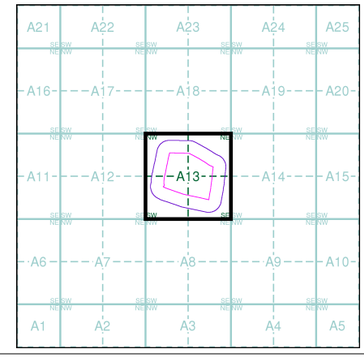
Map Name(s) and Date(s)



Historical Map - Segment A13



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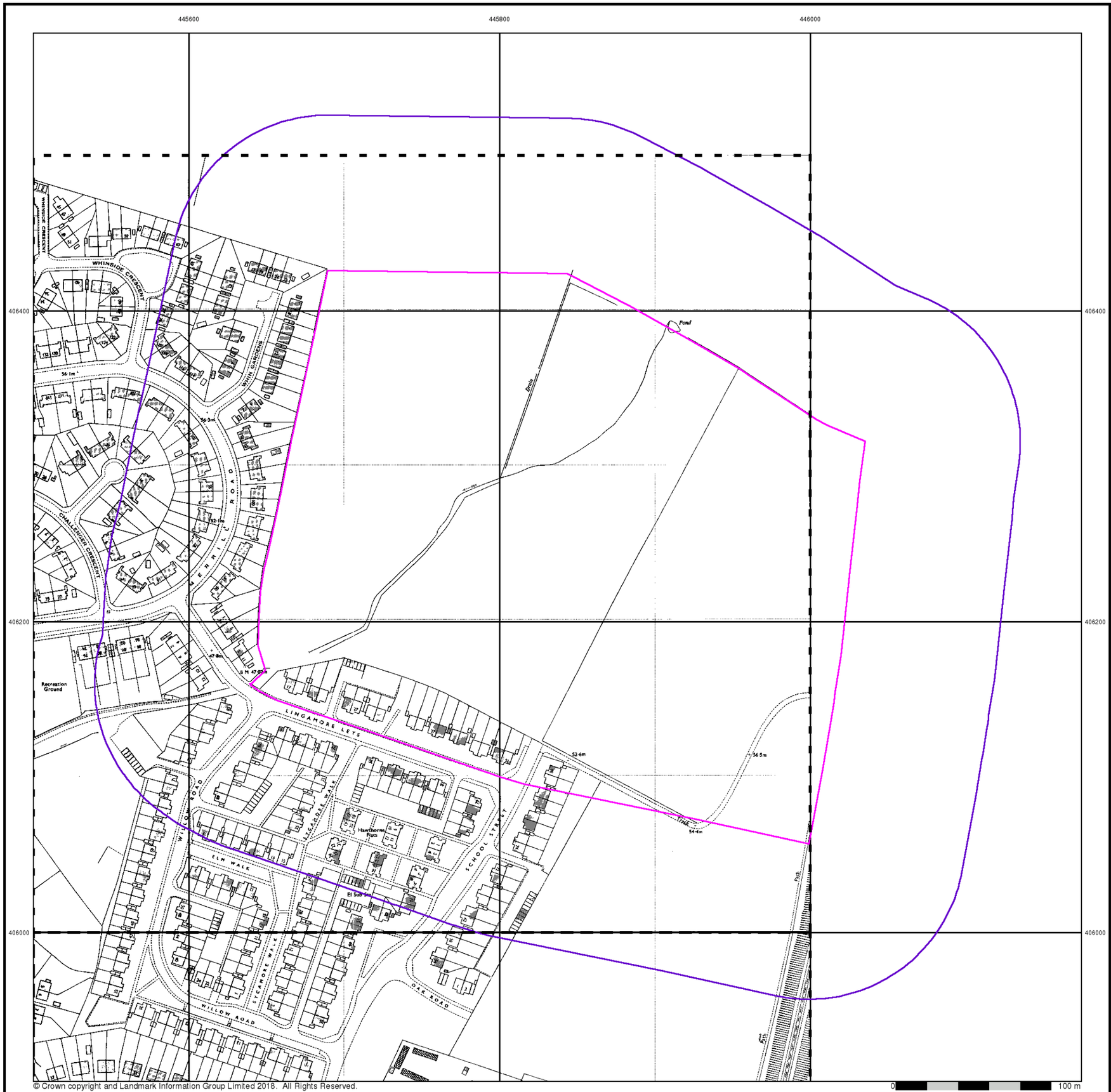

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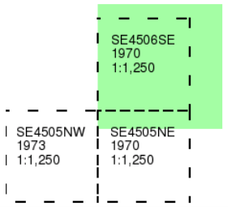
Ordnance Survey Plan

Published 1970 - 1973

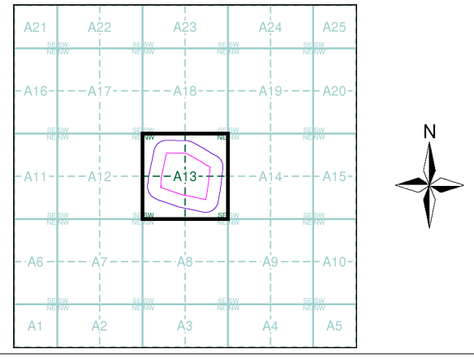
Source map scale - 1:1,250

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



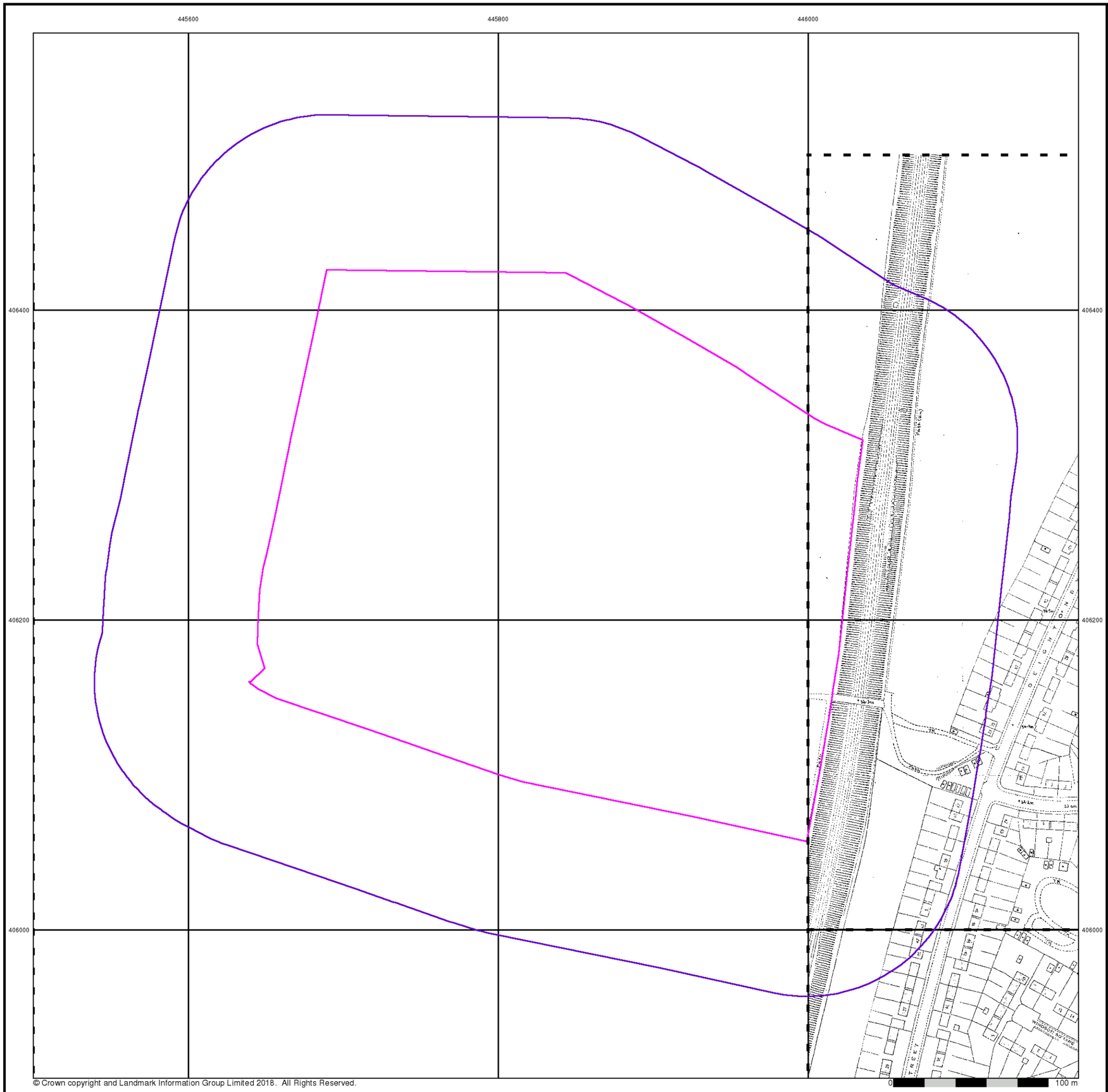
Order Details

Order Number:	178227804_1_1
Customer Ref:	C8023
National Grid Reference:	445840, 406240
Slice:	A
Site Area (Ha):	10.93
Search Buffer (m):	100

Site Details

Phase 3, Thurnscoe, ROTHERHAM, S63 0PQ

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



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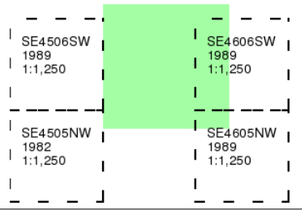
Additional SIMs

Published 1982 - 1989

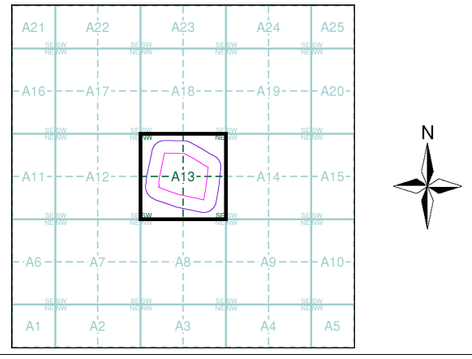
Source map scale - 1:1,250

The SIM cards (Ordnance Survey's `Survey of Information on Microfilm') are further, minor editions of mapping which were produced and published in between the main editions as an area was updated. They date from 1947 to 1994, and contain detailed information on buildings, roads and land-use. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

Order Number:	178227804_1_1
Customer Ref:	C8023
National Grid Reference:	445840, 406240
Slice:	A
Site Area (Ha):	10.93
Search Buffer (m):	100

Site Details

Phase 3, Thurnscoe, ROTHERHAM, S63 0PQ

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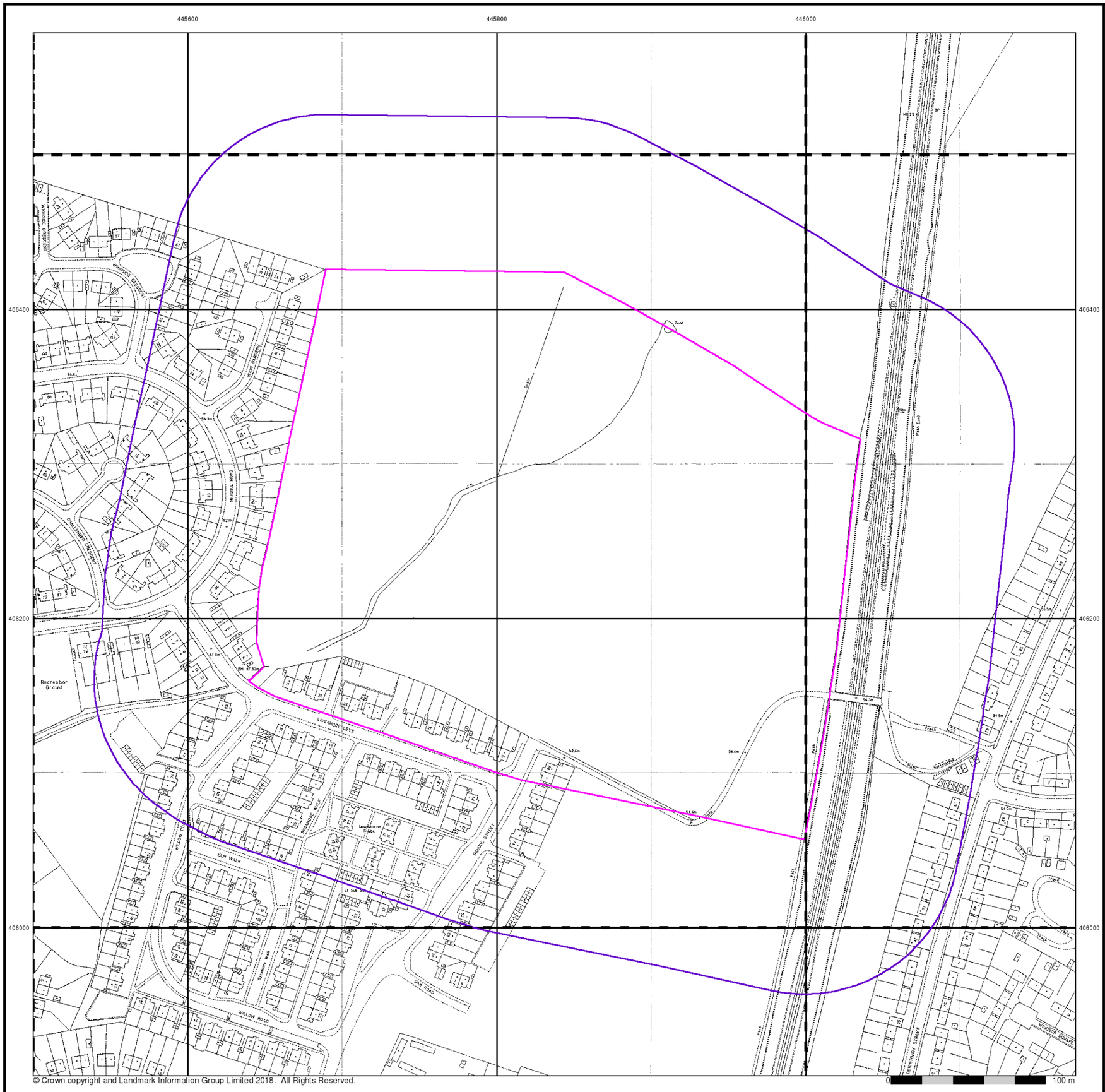


sirius

Large-Scale National Grid Data

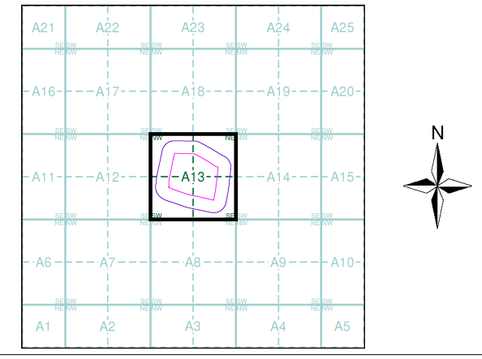
Published 1993

Source map scale - 1:1,250

'Large Scale National Grid Data' superseded SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') in 1992, and continued to be produced until 1999. These maps were the fore-runners of digital mapping and so provide detailed information on houses and roads, but tend to show less topographic features such as vegetation. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)

Historical Map - Segment A13



Order Details

Order Number:	178227804_1_1
Customer Ref:	C8023
National Grid Reference:	445840, 406240
Slice:	A
Site Area (Ha):	10.93
Search Buffer (m):	100

Site Details

Phase 3, Thurnscoe, ROTHERHAM, S63 0PQ

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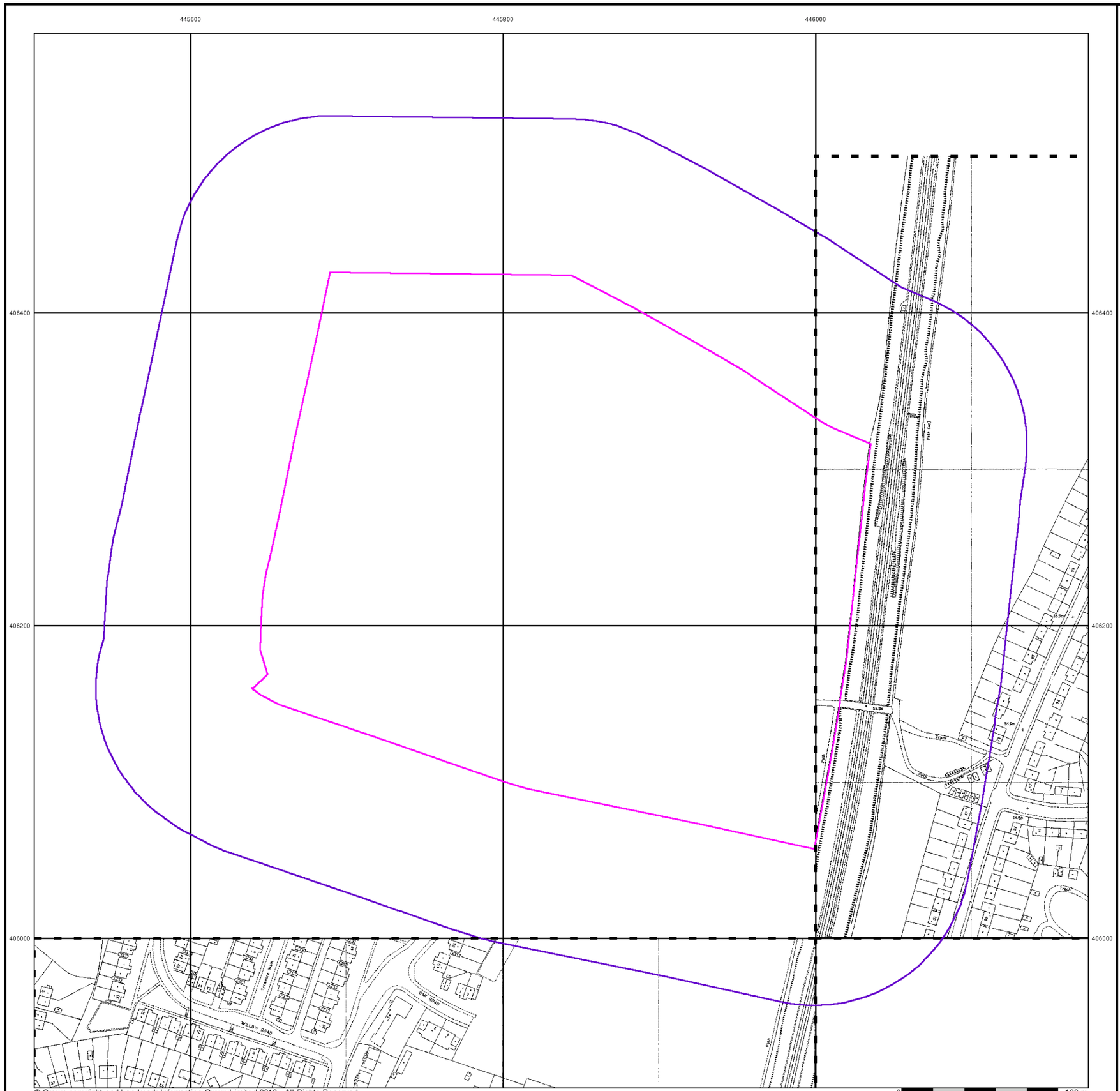

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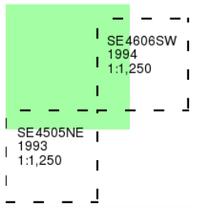
Large-Scale National Grid Data

Published 1993 - 1994

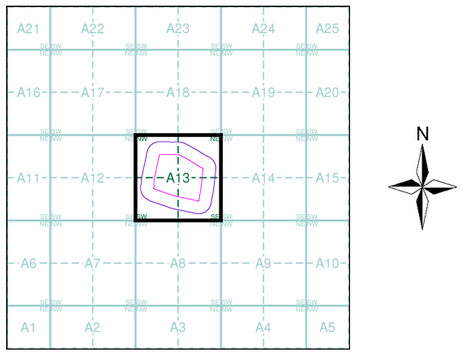
Source map scale - 1:1,250

'Large Scale National Grid Data' superseded SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') in 1992, and continued to be produced until 1999. These maps were the fore-runners of digital mapping and so provide detailed information on houses and roads, but tend to show less topographic features such as vegetation. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

Order Number:	178227804_1_1
Customer Ref:	C8023
National Grid Reference:	445840, 406240
Slice:	A
Site Area (Ha):	10.93
Search Buffer (m):	100

Site Details

Phase 3, Thurnscoe, ROTHERHAM, S63 0PQ

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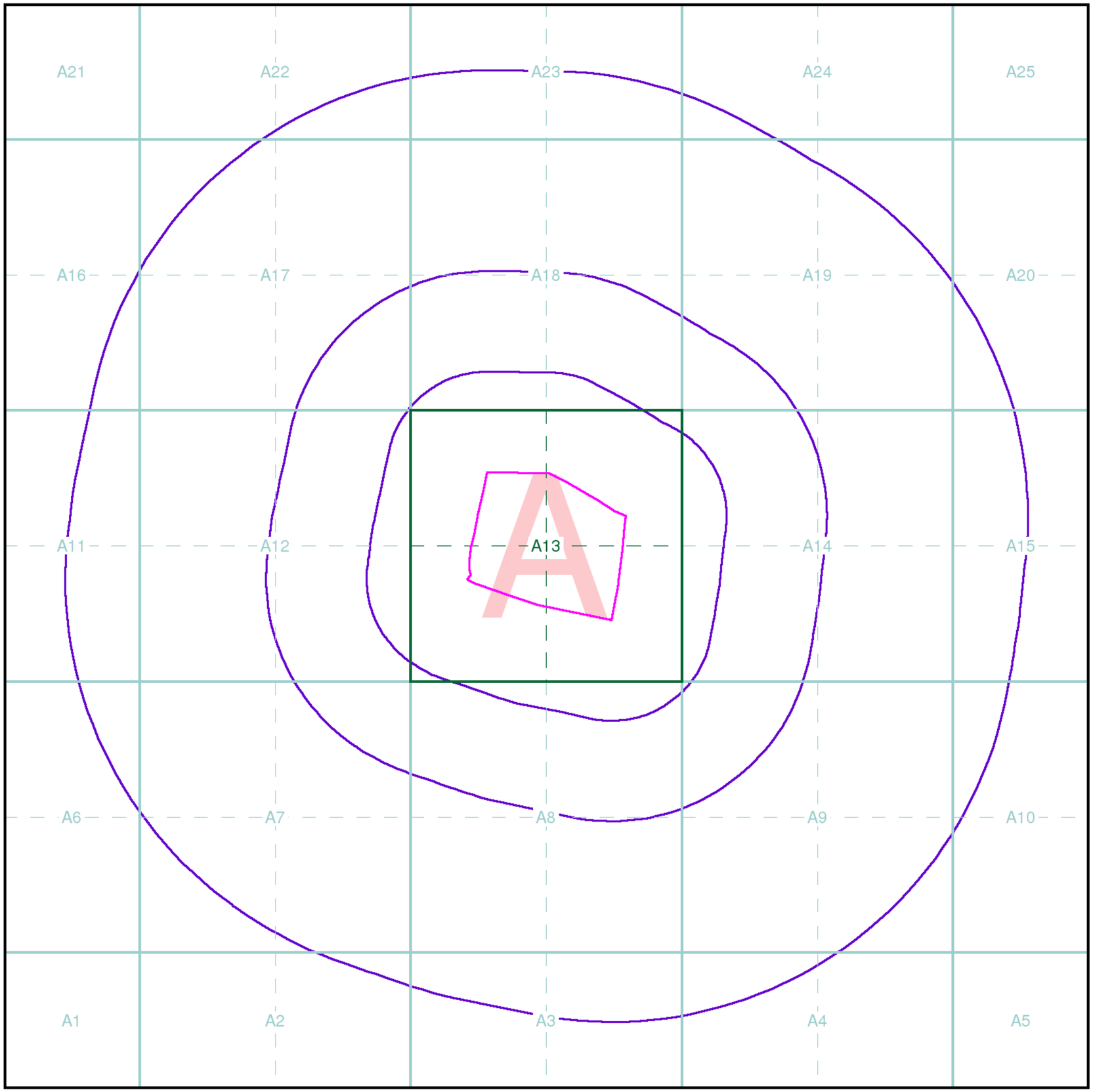

Index Map

For ease of identification, your site and buffer have been split into Slices, Segments and Quadrants. These are illustrated on the Index Map opposite and explained further below.

Slice
Each slice represents a 1:10,000 plot area (2.7km x 2.7km) for your site and buffer. A large site and buffer may be made up of several slices (represented by a red outline), that are referenced by letters of the alphabet, starting from the bottom left corner of the slice "grid". This grid does not relate to National Grid lines but is designed to give best fit over the site and buffer.

Segment
A segment represents a 1:2,500 plot area. Segments that have plot files associated with them are shown in dark green, others in light blue. These are numbered from the bottom left hand corner within each slice.

Quadrant
A quadrant is a quarter of a segment. These are labelled as NW, NE, SW, SE and are referenced in the datasheet to allow features to be quickly located on plots. Therefore a feature that has a quadrant reference of A7NW will be in Slice A, Segment 7 and the NW Quadrant.

A selection of organisations who provide data within this report:

Envirocheck reports are compiled from 136 different sources of data.

Client Details

S Howson, Sirius Geotechnical Ltd, 4245 Park Approach, Thorpe Park, Leeds, LS15 8GB

Order Details

Order Number:	178227804_1_1
Customer Ref:	C8023
National Grid Reference:	445840, 406250
Site Area (Ha):	10.93
Search Buffer (m):	1000

Site Details

Phase 3, Thurnscoe, ROTHERHAM, S63 0PQ

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APPENDIX C

COAL AUTHORITY MINING REPORT

The Coal Authority

Resolving the impacts of mining

CON29M Non-Residential Mining Report

PHASE 3
THURNSCOE
ROTHERHAM
SOUTH YORKSHIRE

Date of enquiry:	29 August 2018
Date enquiry received:	29 August 2018
Issue date:	29 August 2018
Our reference:	51001919208001
Your reference:	178227804_2|

CON29M Non-Residential Mining Report

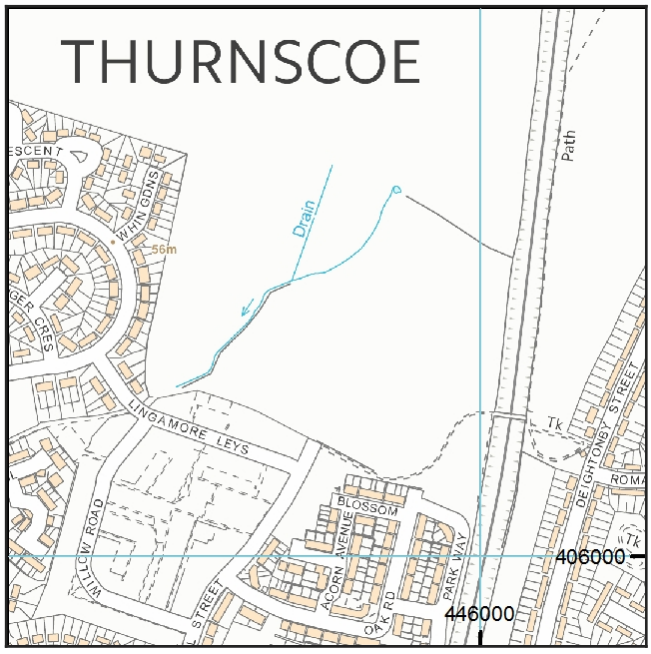
This report is based on, and limited to, the records held by the Coal Authority, at the time we answer the search.

Client name

LANDMARK INFORMATION GROUP LIMITED

Enquiry address

PHASE 3, THURNSCOE, ROTHERHAM, SOUTH YORKSHIRE



Approximate position of property

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NG18 4RG

www.groundstability.com

/company/the-coal-authority
/thecoalauthority
/coalauthority

Summary

Has the search report highlighted evidence or potential of		
1	Past underground coal mining	Yes
2	Present underground coal mining	No
3	Future underground coal mining	Yes
4	Mine entries	No
5	Coal mining geology	No
6	Past opencast coal mining	No
7	Present opencast coal mining	No
8	Future opencast coal mining	No
9	Coal mining subsidence	No
10	Mine gas	No
11	Hazards related to coal mining	No
12	Withdrawal of support	Yes
13	Working facilities order	No
14	Payments to owners of former copyhold land	No

For detailed findings, please go to page 4.

Detailed findings

1. Past underground coal mining

The property is in a surface area that could be affected by underground mining in 7 seams of coal at 140m to 800m depth, and last worked in 1981.

Any movement in the ground due to coal mining activity should have stopped.

2. Present underground coal mining

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

3. Future underground coal mining

The property is not in an area where the Coal Authority has plans to grant a licence to remove coal using underground methods.

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

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

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

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

4. Mine entries

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

5. Coal mining geology

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

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

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

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

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

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

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

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

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

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

12. Withdrawal of support
The property is in an area where a notice to withdraw support was given in 1946.

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

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

14. Payments to owners of former copyhold land

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

Additional remarks

Information provided by the Coal Authority in this report is compiled in response to the Law Society's Con29M Coal Mining enquiries. The said enquiries are protected by copyright owned by the Law Society of 113 Chancery Lane, London WC2A 1PL. This report is prepared in accordance with the Law Society's Guidance Notes 2006, the User Guide 2006 and the Coal Authority's Terms and Conditions applicable at the time the report was produced.

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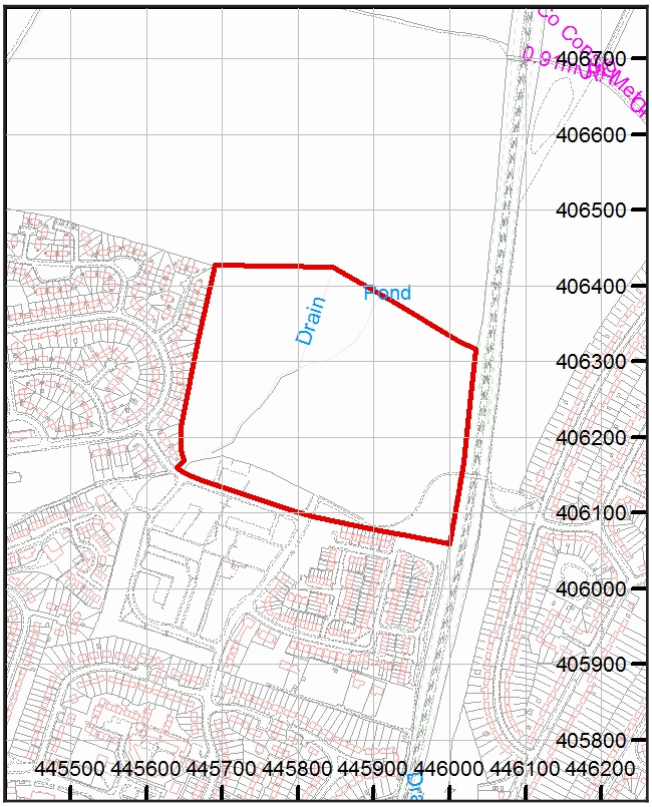
Alternative formats

If you would like this report in an alternative format, please contact our communications team.

Enquiry boundary

Key

Approximate position of enquiry boundary shown



Map data

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/thecoalauthority
/coalauthority

APPENDIX D

RISK ASSESSMENT METHODOLOGY

Qualitative Risk Assessment Methodology

The approach adopted by Sirius for the qualitative assessment of risk is based upon that given in Annex 4 of NHBC-Environment Agency-CIEH "Guidance for the Safe Development of Housing on Land Affected by Contamination" (2008) and is consistent with other current guidance.

The risk posed by viable contaminant linkages is based upon the consideration of both:

a) the magnitude of the potential consequence (i.e. its severity); and,

b) the probability (likelihood) of that consequence being realised.

The classifications used in this report for consequence and probability are given in Tables 1 and 2, respectively. The derived risk classifications are defined in Table 3.

Where there is no viable contaminant linkage there is no potential risk.

Table 1. Classification of Consequence

Classification	Definition
Severe	Contaminant concentrations at the receptor that are likely to result in "significant harm" to human health (as defined in Part 2A of the Environmental Protection Act 1990). Major pollution of controlled waters that could have persistent and/or extensive effects on water quality, for example fish kills, closure of an abstraction, or substantial deterioration in quality of the receiving water body. Major impact on receptor amenity value or major damage to agriculture or commerce. Major damage to an ecosystem that is likely to result in a substantial adverse change in its functioning or harm to a species of special interest that endangers the long-term maintenance of the population. Catastrophic damage to crops, buildings or property.
Medium	Elevated concentrations at the receptor that might result in "significant harm" to human health (as defined in Part 2A of the Environmental Protection Act 1990). A pollution incident that has significant effect on water quality or abstraction potential. An incident that has a marked effect on receptor amenity value, agriculture or commerce. Damage to an ecosystem that may result in a substantial adverse change in its functioning or harm to a species of special interest that may endanger the long-term maintenance of the population. Significant damage to crops, buildings or property.

Classification	Definition
Mild	Potential human health impact at the receptor point but unlikely to be classified as "significant harm" (as defined in Part 2A of the Environmental Protection Act 1990). Pollution of water that will have a small or short-lived effect on water quality and marginal effects on its amenity or resource value or its use in agriculture or commerce. Minor or short-lived damage to ecosystems, which is unlikely to result in a substantial adverse change Minor damage to crops, buildings or property
Minor	No potential measurable detrimental human health impacts at the receptor point. Impact on water that will have no or minimal effect on water quality or use. No or minor and easily repairable effects on buildings, structures and services.

Table 2. Classification of Probability

Classification	Definition
High	An impact is already occurring or is very likely in the short-term and almost inevitable over the long-term.
Medium	It is probable that an event would occur. This is not inevitable but possible in the short-term and likely over the long-term.
Low	Circumstances are possible under which an event could occur. However, it is by no means certain that an event will take place, even over the long-term.
Unlikely	Circumstances are such that it is improbable that an event would occur even over the very long-term.

Table 3. Risk Classification

	Consequence			
Probability	***Severe***	***Medium***	***Mild***	***Minor***
High	Very High	High	Moderate	Low
Medium	High	Moderate	Low to Moderate	Low
Low	Moderate	Low to Moderate	Low	Very Low
Unlikely	Low to Moderate	Low	Very Low	Negligible

Table 4 provides a context for interpretation of the risk classification categories. The definitions provided are based on those given in CIRIA (2001) "Contaminated Land Risk Assessment. A Guide to Good Practice", Report C552.

Table 4. Interpretation of Risk Classification Categories

Risk Classification	Definition
Very High	There is a high probability that severe harm to one or more identified receptors could occur or there is evidence that this is already happening. This risk is likely to result in a substantial liability. Urgent investigation and remediation are likely to be required.
High	Harm is likely to be caused to one or more identified receptors. Realisation of the risk is likely to present a substantial liability. Urgent investigation is required and remedial works may be necessary in the short-term and are likely over the longer term.
Moderate	It is possible that harm could be caused to one or more identified receptors. However, it is relatively unlikely that such harm would be severe. Investigation is normally required to clarify the risk and to determine the potential liability. Some remedial works may be required in the longer term.
Low	It is possible that harm could be caused to one or more identified receptors but it is likely that this harm, if realised, would normally be mild. No further investigation is considered necessary to assess risk or environmental liability but investigations could be undertaken if desired to confirm 'baseline' conditions for the purposes of liability management. Remedial works are unlikely to be required.
Very Low	There is a low probability that harm could be caused to one or more identified receptors. In the event of such harm being realised, it is likely to be mild, at worst. No further investigation is considered necessary to assess risk or environmental liability but investigations could be undertaken if desired to confirm 'baseline' conditions for the purposes of liability management. Remedial works are very unlikely to be required.
Negligible	It is unlikely that harm could be caused to one or more identified receptors. In the event of harm being realised, it is likely to be minor. No further investigation is considered necessary to assess risk or environmental liability. Remedial works are not expected.

APPENDIX E

EXPLORATORY HOLE LOGS

TRIAL PIT RECORD

TP No. **TP01** Sheet 1 of 1

Site: School Street (Phase 3), Thurnscoe

Contract No: C8023

Client: Keepmoat Homes

Date: 10/09/2018

Method: JCB 3CX with 2 foot toothed bucket.

Scale: 1:25

Logged By: RC Checked By: GH

SAMPLE DETAILS				STRATA RECORD				
Type	Depth From - To(m)	Vane Results (kN/m2) (ppm)	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
ES	0.30			MADE GROUND: Brown, slightly gravelly, slightly clayey SAND with common roots and rootlets. Gravel is fine to coarse, sub-angular of brick, with fragments of plastic and plastic bag. [REWORKED TOPSOIL]	0.40	46.02		
				Stiff, grey, mottled yellowish brown slightly sandy CLAY with common roots and root traces. Low plasticity (field description). Friable. [RESIDUAL PENNINE UPPER COAL MEASURES FORMATION]				
		42.0			1.50	44.92		
D	1.70			Firm, medium strength dark grey, occasionally mottled brown gravelly CLAY with infrequent rootlets. High plasticity (field description). Gravel is fine to coarse, angular to tabular of siltstone and carbonaceous mudstone. [RESIDUAL PENNINE UPPER COAL MEASURES FORMATION]				
		64.0						
		67.0			2.40	44.02		
D	2.60			Very stiff, bluish grey gravelly CLAY and rare rootlets. High plasticity. Friable. Gravel is fine to coarse, angular to tabular of carbonaceous mudstone. [RESIDUAL PENNINE UPPER COAL MEASURES FORMATION]				
				End of trial pit at 2.80m	2.80	43.62		

Remarks and Groundwater Observations

1. Terminated in natural ground at 2.8m bgl due to slow progress. 2. Groundwater seepage was noted at 2.8m bgl. 3. No visual or olfactory evidence of contamination. 4. Trial pit was stable. 5. Trial pit was backfilled with arisings on completion.

GL (m AOD) 46.42

Easting: 445693.05

Northing: 406189.11

Fig No. TP01

TRIAL PIT RECORD

TP No. **TP02** Sheet 1 of 1

Site: School Street (Phase 3), Thurnscoe

Contract No: C8023

Client: Keepmoat Homes

Date: 10/09/2018

Method: JCB 3CX with 2 foot toothed bucket.

Scale: 1:25

Logged By: RC Checked By: GH

SAMPLE DETAILS				STRATA RECORD				
Type	Depth From - To(m)	Vane Results (kN/m2) (ppm)	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
ES	0.20			Dark brown, slightly clayey slightly organic SAND with frequent roots, rootlets and traces. [TOPSOIL]	0.30	48.40		
				Stiff, grey, mottled yellowish brown, slightly sandy gravelly CLAY. Low plasticity (field description). Friable. Gravel is fine to coarse, angular to tabular of siltstone. [RESIDUAL PENNINE UPPER COAL MEASURES FORMATION]	0.90	47.80		
D	1.10			Extremely weak, distinctly weathered, greyish brown SILTSTONE. Recovered as gravel with moderate cobble content. Gravel is fine to coarse, gravel and cobbles are angular to tabular. [PENNINE UPPER COAL MEASURES FORMATION]				
				End of trial pit at 2.10m	2.10	46.60		

1 2 3 4 5

Remarks and Groundwater Observations

1. Terminated at 2.1m bgl in competent bedrock. 2. No groundwater encountered. 3. No visual or olfactory evidence of contamination. 4. Trial pit was stable. 5. Trial pit was backfilled with arisings on completion.

GL (m AOD) 48.70

Easting: 445742.15

Northing: 406195.46

Fig No. TP02

TRIAL PIT RECORD

TP No. **TP03** Sheet 1 of 1

Site: School Street (Phase 3), Thurnscoe

Contract No: C8023

Client: Keepmoat Homes

Date: 10/09/2018

Method: JCB 3CX with 2 foot toothed bucket.

Scale: 1:25

Logged By: RC Checked By: GH

SAMPLE DETAILS				STRATA RECORD				
Type	Depth From - To(m)	Vane Results (kN/m2) (ppm)	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
ES	0.20			Dark brown, slightly clayey slightly organic SAND with frequent roots, rootlets and traces. [TOPSOIL]	0.30	52.55		
B	0.90			Stiff, grey, mottled light brown, slightly sandy gravelly CLAY. Low plasticity (field description). Friable. Gravel is fine to coarse, angular to tabular of siltstone. [RESIDUAL PENNINE UPPER COAL MEASURES FORMATION]	1.00	51.85		
			1	Extremely weak , distinctly weathered, grey and brown SILTSTONE. Recovered as slightly clayey angular to tabular gravel with low cobble content. [PENNINE UPPER COAL MEASURES FORMATION]	1.80	51.05		
			2	Extremely weak, distinctly to partially weathered, greyish brown SANDSTONE. Recovered as gravel with moderate cobble content. Gravel is fine to coarse, gravel and cobbles are angular to tabular. [PENNINE UPPER COAL MEASURES FORMATION]	2.30	50.55		
				End of trial pit at 2.30m				
			3					
			4					
			5					

Remarks and Groundwater Observations

1. Terminated at 2.3m bgl in competent bedrock. 2. No groundwater encountered. 3. No visual or olfactory evidence of contamination. 4. Trial pit was stable. 5. Trial pit was backfilled with arisings on completion.

GL (m AOD) 52.85

Easting: 445793.73

Northing: 406194.97

Fig No. TP03

TRIAL PIT RECORD

TP No. **TP04** Sheet 1 of 1

Site: School Street (Phase 3), Thurnscoe

Contract No: C8023

Client: Keepmoat Homes

Date: 10/09/2018

Method: JCB 3CX with 2 foot toothed bucket.

Scale: 1:25

Logged By: RC Checked By: GH

SAMPLE DETAILS				STRATA RECORD				
Type	Depth From - To(m)	Vane Results (kN/m2) (ppm)	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
ES	0.20			Dark brown, slightly clayey slightly organic SAND with frequent roots, rootlets and traces. [TOPSOIL]	0.20	55.28		
D	0.90			Very stiff, light grey, mottled reddish brown, slightly sandy gravelly CLAY with roots and root traces. Intermediate plasticity. Friable. Gravel is fine to coarse, angular to tabular of siltstone. [RESIDUAL PENNINE UPPER COAL MEASURES FORMATION]				
				Extremely weak, distinctly weathered, grey SILTSTONE. Recovered as slightly clayey angular to tabular gravel. [PENNINE UPPER COAL MEASURES FORMATION]	1.40	54.08		
				End of trial pit at 2.40m	2.40	53.08		

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Remarks and Groundwater Observations

1. Terminated at 2.4m bgl in competent bedrock. 2. No groundwater encountered. 3. No visual or olfactory evidence of contamination. 4. Trial pit was stable. 5. Trial pit was backfilled with arisings on completion.

GL (m AOD) 55.48

Easting: 445847.65

Northing: 406195.33

Fig No. TP04

TRIAL PIT RECORD

TP No. **TP05** Sheet 1 of 1

Site: School Street (Phase 3), Thurnscoe

Contract No: C8023

Client: Keepmoat Homes

Date: 10/09/2018

Method: JCB 3CX with 2 foot toothed bucket.

Scale: 1:25

Logged By: RC Checked By: GH

SAMPLE DETAILS				STRATA RECORD				
Type	Depth From - To(m)	Vane Results (kN/m2) (ppm)	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
ES	0.20			Dark brown, slightly clayey slightly organic SAND with frequent roots, rootlets and traces. [TOPSOIL]	0.30	55.60		
D	0.60			Very stiff, light grey, mottled brown, slightly sandy gravelly CLAY with roots and root traces. Low plasticity (field description). Friable. Gravel is fine to coarse, angular to tabular of siltstone. [RESIDUAL PENNINE UPPER COAL MEASURES FORMATION]	1.30	54.60		
				Grey mottled orangish brown sandy GRAVEL. Gravel is fine to coarse, angular to tabular of siltstone. [RESIDUAL PENNINE UPPER COAL MEASURES FORMATION]	1.60	54.30		
				Extremely weak, distinctly weathered, brown SILTSTONE. Recovered as slightly clayey angular to tabular gravel with moderate cobble content. [PENNINE UPPER COAL MEASURES FORMATION]				
				End of trial pit at 2.10m	2.10	53.80		

1 2 3 4 5

Remarks and Groundwater Observations

1. Terminated at 2.1m bgl in competent bedrock. 2. No groundwater encountered. 3. No visual or olfactory evidence of contamination. 4. Trial pit was stable. 5. Trial pit was backfilled with arisings on completion.

GL (m AOD) 55.90

Easting: 445893.40

Northing: 406189.19

Fig No. TP05

TRIAL PIT RECORD

TP No. **TP06** Sheet 1 of 1

Site: School Street (Phase 3), Thurnscoe

Contract No: C8023

Client: Keepmoat Homes

Date: 10/09/2018

Method: JCB 3CX with 2 foot toothed bucket.

Scale: 1:25

Logged By: RC Checked By: GH

SAMPLE DETAILS				STRATA RECORD				
Type	Depth From - To(m)	Vane Results (kN/m2) (ppm)	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
ES	0.10			Dark brown, slightly clayey slightly organic SAND with frequent roots, rootlets and traces. [TOPSOIL]	0.30	55.90		
D	1.10			Light brownish grey sandy GRAVEL. Gravel is fine to coarse, angular to tabular of siltstone and rare carbonaceous mudstone. [RESIDUAL PENNINE UPPER COAL MEASURES FORMATION]	2.00	54.20		
				Dark brownish grey sandy GRAVEL with low cobble content. Gravel is fine to coarse, gravel and cobbles are angular to tabular of siltstone. [RESIDUAL PENNINE UPPER COAL MEASURES FORMATION]	2.40	53.80		
				End of trial pit at 2.40m				

1 2 3 4 5

Remarks and Groundwater Observations

1. Terminated in natural ground at 2.4m bgl due to slow progress. 2. No groundwater encountered. 3. No visual or olfactory evidence of contamination. 4. Trial pit was stable. 5. Trial pit was backfilled with arisings on completion.

GL (m AOD) 56.20

Easting: 445943.53

Northing: 406187.04

Fig No. TP06

TRIAL PIT RECORD

TP No. **TP07** Sheet 1 of 1

Site: School Street (Phase 3), Thurnscoe

Contract No: C8023

Client: Keepmoat Homes

Date: 10/09/2018

Method: JCB 3CX with 2 foot toothed bucket.

Scale: 1:25

Logged By: RC Checked By: GH

SAMPLE DETAILS				STRATA RECORD				
Type	Depth From - To(m)	Vane Results (kN/m2) (ppm)	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
ES B	0.20 0.30 - 0.60			Dark brown, slightly clayey slightly organic SAND with frequent roots, rootlets and traces. [TOPSOIL]				
				Very stiff, light grey mottled orange CLAY. Low plasticity (field description). Friable. [RESIDUAL PENNINE UPPER COAL MEASURES FORMATION]	0.35	55.60		
				Stiff, bluish grey gravelly CLAY with rare rootlets. Low plasticity (field description). Friable. Gravel is fine to coarse, angular to tabular of siltstone. [RESIDUAL PENNINE UPPER COAL MEASURES FORMATION]	1.30	54.65		
				Light brown sandy GRAVEL with low cobble content. Gravel is fine to coarse, gravel and cobbles are angular to tabular of siltstone. [RESIDUAL PENNINE UPPER COAL MEASURES FORMATION]	1.80	54.15		
				End of trial pit at 2.00m	2.00	53.95		

Remarks and Groundwater Observations

1. Terminated in natural ground at 2.0m bgl due to slow progress. 2. No groundwater encountered. 3. No visual or olfactory evidence of contamination. 4. Trial pit was stable. 5. Trial pit was backfilled with arisings on completion.

GL (m AOD) 55.95

Easting: 445962.60

Northing: 406138.69

Fig No. TP07

TRIAL PIT RECORD

TP No. **TP08** Sheet 1 of 1

Site: School Street (Phase 3), Thurnscoe

Contract No: C8023

Client: Keepmoat Homes

Date: 10/09/2018

Method: JCB 3CX with 2 foot toothed bucket.

Scale: 1:25

Logged By: RC Checked By: GH

SAMPLE DETAILS | STRATA RECORD

Type	Depth From - To(m)	Vane Results (kN/m2) (ppm)	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
ES	0.20			Dark brown, slightly clayey slightly organic SAND with frequent roots, rootlets and traces. [TOPSOIL]	0.30	53.82		
D	0.90			Very stiff, light brown, slightly gravelly CLAY. Low plasticity. Gravel is fine to coarse, angular to tabular of siltstone. [RESIDUAL PENNINE UPPER COAL MEASURES FORMATION]				
				Extremely weak, distinctly to partially weathered, grey SANDSTONE. Recovered as angular to tabular gravel with low cobble content. [PENNINE UPPER COAL MEASURES FORMATION]	1.60	52.52		
				End of trial pit at 2.70m	2.70	51.42		

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4
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Remarks and Groundwater Observations

1. Terminated at 2.7m bgl in competent bedrock. 2. No groundwater encountered. 3. No visual or olfactory evidence of contamination. 4. Trial pit was stable. 5. Trial pit was backfilled with arisings on completion.

GL (m AOD) 54.12

Easting: 445866.30

Northing: 406129.70

Fig No. TP08

TRIAL PIT RECORD

TP No. **TP09** Sheet 1 of 1

Site: School Street (Phase 3), Thurnscoe

Contract No: C8023

Client: Keepmoat Homes

Date: 11/09/2018

Method: JCB 3CX with 2 foot toothed bucket.

Scale: 1:25

Logged By: RC Checked By: GH

SAMPLE DETAILS				STRATA RECORD				
Type	Depth From - To(m)	Vane Results (kN/m2) (ppm)	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
ES	0.10			Dark brown, slightly clayey slightly organic SAND with frequent roots, rootlets and traces. [TOPSOIL]	0.30	52.34		
B	0.60 - 0.80			Very stiff, grey, mottled brown slightly gravelly slightly sandy CLAY. Intermediate plasticity. Friable. Gravel is fine to coarse, angular to tabular of siltstone. [RESIDUAL PENNINE UPPER COAL MEASURES FORMATION]				
D	1.40			Extremely weak, partially weathered, grey mottled brown SANDSTONE. Recovered as fine to coarse, angular to tabular gravel. [PENNINE UPPER COAL MEASURES FORMATION]	1.30 1.40	51.34 51.24		
				End of trial pit at 1.40m				

1
2
3
4
5

Remarks and Groundwater Observations

1. Terminated at 1.4m bgl in competent bedrock. 2. No groundwater encountered. 3. No visual or olfactory evidence of contamination. 4. Trial pit was stable. 5. Trial pit was backfilled with arisings on completion.

GL (m AOD) 52.64

Easting: 445822.60

Northing: 406148.91

Fig No. TP09

TRIAL PIT RECORD

TP No. **TP10** Sheet 1 of 1

Site: School Street (Phase 3), Thurnscoe

Contract No: C8023

Client: Keepmoat Homes

Date: 11/09/2018

Method: JCB 3CX with 2 foot toothed bucket.

Scale: 1:25

Logged By: RC Checked By: GH

SAMPLE DETAILS				STRATA RECORD				
Type	Depth From - To(m)	Vane Results (kN/m2) (ppm)	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
ES	0.30			Dark brown, slightly clayey slightly organic SAND with frequent roots, rootlets and traces. [TOPSOIL]	0.30	53.11		
				Very stiff, grey mottled light brown gravelly CLAY. Low plasticity (field description). Friable. Gravel is fine to coarse, angular to tabular of siltstone. [RESIDUAL PENNINE UPPER COAL MEASURES FORMATION]				
			1	*Land drain.*				
D	1.20			Extremely weak, distinctly weathered, grey SILTSTONE. Recovered as angular to tabular gravel with moderate cobble content. [PENNINE UPPER COAL MEASURES FORMATION]	1.20	52.21		
				End of trial pit at 1.90m	1.90	51.51		
			2					
			3					
			4					
			5					

Remarks and Groundwater Observations

1. Terminated at 1.9m bgl in competent bedrock. 2. No groundwater encountered. 3. No visual or olfactory evidence of contamination. 4. Trial pit was stable. 5. Trial pit was backfilled with arisings on completion.

GL (m AOD) 53.41

Easting: 445692.55

Northing: 406291.26

Fig No. TP10

TRIAL PIT RECORD

TP No. **TP11** Sheet 1 of 1

Site: School Street (Phase 3), Thurnscoe

Contract No: C8023

Client: Keepmoat Homes

Date: 11/09/2018

Method: JCB 3CX with 2 foot toothed bucket.

Scale: 1:25

Logged By: RC Checked By: GH

SAMPLE DETAILS				STRATA RECORD				
Type	Depth From - To(m)	Vane Results (kN/m2) (ppm)	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
ES	0.20			Dark brown, slightly clayey slightly organic SAND with frequent roots, rootlets and traces. [TOPSOIL]	0.30	51.02		
B	0.40 - 0.60			Very stiff, grey mottled light brown gravelly CLAY. Low plasticity (field description). Friable. Gravel is fine to coarse, angular to tabular of siltstone. [RESIDUAL PENNINE UPPER COAL MEASURES FORMATION]	0.80	50.52		
			1	Extremely weak, distinctly weathered, greyish brown SILTSTONE with thin sandstone laminations. Recovered as angular to tabular gravel with moderate cobble content. [PENNINE UPPER COAL MEASURES FORMATION]				
D	1.50			End of trial pit at 1.50m	1.50	49.82		
			2					
			3					
			4					
			5					

Remarks and Groundwater Observations

1. Terminated at 1.5m bgl in competent bedrock. 2. No groundwater encountered. 3. No visual or olfactory evidence of contamination. 4. Trial pit was stable. 5. Trial pit was backfilled with arisings on completion.

GL (m AOD) 51.32

Easting: 445746.78

Northing: 406288.76

Fig No. TP11

TRIAL PIT RECORD

TP No. **TP12** Sheet 1 of 1

Site: School Street (Phase 3), Thurnscoe

Contract No: C8023

Client: Keepmoat Homes

Date: 11/09/2018

Method: JCB 3CX with 2 foot toothed bucket.

Scale: 1:25

Logged By: RC Checked By: GH

SAMPLE DETAILS				STRATA RECORD				
Type	Depth From - To(m)	Vane Results (kN/m2) (ppm)	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
ES	0.30			Dark brown, slightly clayey slightly organic SAND with frequent roots, rootlets and traces. [TOPSOIL]	0.40	49.43		
D	0.80			Stiff, dark grey, mottled red and yellowish brown CLAY with roots and rootlets. Low plasticity (field description). Friable. [RESIDUAL PENNINE UPPER COAL MEASURES FORMATION]				
D	2.40			Stiff, grey, mottled brown gravelly CLAY. Low plasticity (field description). Friable. Gravel is fine to coarse, angular to tabular of siltstone. [RESIDUAL PENNINE UPPER COAL MEASURES FORMATION]	2.10	47.73		
				End of trial pit at 2.40m	2.40	47.43		

1 2 3 4 5

Remarks and Groundwater Observations

1. Terminated at 2.4m bgl due to slow progress. 2. No groundwater encountered. 3. No visual or olfactory evidence of contamination. 4. Trial pit was stable. 5. Trial pit was backfilled with arisings on completion.

GL (m AOD) 49.83

Easting: 445796.48

Northing: 406284.74

Fig No. TP12

TRIAL PIT RECORD

TP No. **TP13** Sheet 1 of 1

Site: School Street (Phase 3), Thurnscoe

Contract No: C8023

Client: Keepmoat Homes

Date: 11/09/2018

Method: JCB 3CX with 2 foot toothed bucket.

Scale: 1:25

Logged By: RC Checked By: GH

SAMPLE DETAILS				STRATA RECORD				
Type	Depth From - To(m)	Vane Results (kN/m2) (ppm)	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
ES	0.10			Dark brown, slightly clayey slightly organic SAND with frequent roots, rootlets and traces. [TOPSOIL]	0.20	51.48		
D	0.90			Very stiff, grey, mottled brown gravelly CLAY. Low plasticity (field description). Friable. Gravel is fine to coarse, angular to tabular of siltstone. [RESIDUAL PENNINE UPPER COAL MEASURES FORMATION]				
				Extremely weak, distinctly weathered, grey SILTSTONE. Recovered as fine to coarse, angular to tabular gravel. [PENNINE UPPER COAL MEASURES FORMATION]	1.30	50.38		
				End of trial pit at 2.50m	2.50	49.18		

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Remarks and Groundwater Observations

1. Terminated at 2.5m bgl in competent bedrock. 2. No groundwater encountered. 3. No visual or olfactory evidence of contamination. 4. Trial pit was stable. 5. Trial pit was backfilled with arisings on completion.

GL (m AOD) 51.68

Easting: 445846.81

Northing: 406284.26

Fig No. TP13

TRIAL PIT RECORD

TP No. **TP14** Sheet 1 of 1

Site: School Street (Phase 3), Thurnscoe

Contract No: C8023

Client: Keepmoat Homes

Date: 11/09/2018

Method: JCB 3CX with 2 foot toothed bucket.

Scale: 1:25

Logged By: RC Checked By: GH

SAMPLE DETAILS				STRATA RECORD				
Type	Depth From - To(m)	Vane Results (kN/m2) (ppm)	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
ES	0.20			Dark brown, slightly clayey slightly organic SAND with frequent roots, rootlets and traces. [TOPSOIL]	0.40	52.53		
D	0.70			Very stiff, grey, occasionally mottled black gravelly CLAY. Intermediate plasticity. Friable. Gravel is fine to coarse, angular to tabular of siltstone and rare carbonaceous material. [RESIDUAL PENNINE UPPER COAL MEASURES FORMATION]				
				End of trial pit at 1.50m	1.50	51.43		

Remarks and Groundwater Observations

1. Terminated in natural ground at 1.5m bgl. 2. No groundwater encountered. 3. No visual or olfactory evidence of contamination. 4. Trial pit was stable. 5. Trial pit was backfilled with arisings on completion.

GL (m AOD) 52.93

Easting: 445894.63

Northing: 406281.45

Fig No. TP14

TRIAL PIT RECORD

TP No. **TP15** Sheet 1 of 1

Site: School Street (Phase 3), Thurnscoe

Contract No: C8023

Client: Keepmoat Homes

Date: 11/09/2018

Method: JCB 3CX with 2 foot toothed bucket.

Scale: 1:25

Logged By: RC Checked By: GH

SAMPLE DETAILS				STRATA RECORD				
Type	Depth From - To(m)	Vane Results (kN/m2) (ppm)	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
ES	0.10			Dark brown, slightly clayey slightly organic SAND with frequent roots, rootlets and traces. [TOPSOIL]	0.30	54.22		
B	0.40 - 0.70			Very stiff, grey, mottled yellowish brown gravelly CLAY. Low plasticity (field description). Friable. Gravel is fine to coarse, angular to tabular of siltstone. [RESIDUAL PENNINE UPPER COAL MEASURES FORMATION]	0.90	53.62		
			1	Brown sandy GRAVEL. Gravel is fine to coarse, angular to tabular, of siltstone. [RESIDUAL PENNINE UPPER COAL MEASURES FORMATION]	1.00	53.52		
D	1.30			Very stiff, grey and black gravelly CLAY. Intermediate plasticity. Friable. Gravel is fine to coarse, angular to tabular of carbonaceous mudstone. [RESIDUAL PENNINE UPPER COAL MEASURES FORMATION]	1.80	52.72		
			2	Extremely weak, distinctly weathered, grey and brown SILTSTONE with laminations of carbonaceous mudstone. Recovered as fine to coarse, angular to tabular gravel. [PENNINE UPPER COAL MEASURES FORMATION]	2.10	52.42		
				End of trial pit at 2.10m				
			3					
			4					
			5					

Remarks and Groundwater Observations

1. Terminated at 2.1m bgl in competent bedrock. 2. No groundwater encountered. 3. No visual or olfactory evidence of contamination. 4. Trial pit was stable. 5. Trial pit was backfilled with arisings on completion.

GL (m AOD) 54.52

Easting: 445944.37

Northing: 406280.95

Fig No. TP15

TRIAL PIT RECORD

TP No. **TP16** Sheet 1 of 1

Site: School Street (Phase 3), Thurnscoe

Contract No: C8023

Client: Keepmoat Homes

Date: 11/09/2018

Method: JCB 3CX with 2 foot toothed bucket.

Scale: 1:25

Logged By: RC Checked By: GH

SAMPLE DETAILS				STRATA RECORD				
Type	Depth From - To(m)	Vane Results (kN/m2) (ppm)	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
ES	0.20			Dark brown, slightly clayey slightly organic SAND with frequent roots, rootlets and traces. [TOPSOIL]				
					0.30	54.75		
B	0.50 - 0.80			Light yellowish brown sandy GRAVEL. Gravel is fine to coarse, angular to sub-angular of sandstone. [RESIDUAL PENNINE UPPER COAL MEASURES FORMATION]				
					0.90	54.15		
			1	Extremely weak, partially weathered, greyish brown SANDSTONE. Recovered as fine to coarse, angular to tabular gravel. [PENNINE UPPER COAL MEASURES FORMATION]				
					1.10	53.95		
				End of trial pit at 1.10m				
			2					
			3					
			4					
			5					

Remarks and Groundwater Observations

1. Terminated at 1.1m bgl in competent bedrock. 2. No groundwater encountered. 3. No visual or olfactory evidence of contamination. 4. Trial pit was stable. 5. Trial pit was backfilled with arisings on completion.

GL (m AOD) 55.05

Easting: 445987.48

Northing: 406281.29

Fig No. TP16

TRIAL PIT RECORD

TP No. **TP17** Sheet 1 of 1

Site: School Street (Phase 3), Thurnscoe

Contract No: C8023

Client: Keepmoat Homes

Date: 11/09/2018

Method: JCB 3CX with 2 foot toothed bucket.

Scale: 1:25

Logged By: RC Checked By: GH

SAMPLE DETAILS				STRATA RECORD				
Type	Depth From - To(m)	Vane Results (kN/m2) (ppm)	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
ES	0.20			Dark brown, slightly clayey slightly organic SAND with frequent roots, rootlets and traces. [TOPSOIL]	0.30	54.92		
D	0.80			Very stiff, grey, mottled brown and light brown gravelly CLAY with root traces. Low plasticity (field description). Friable. Gravel is fine to coarse, angular to tabular of siltstone. [RESIDUAL PENNINE UPPER COAL MEASURES FORMATION]	1.00	54.22		
				Extremely weak, distinctly weathered, greyish black SILTSTONE with laminations of carbonaceous mudstone. Recovered as fine to coarse, angular to tabular gravel. [PENNINE UPPER COAL MEASURES FORMATION]	2.10	53.12		
				End of trial pit at 2.10m				

Remarks and Groundwater Observations

1. Terminated at 2.1m bgl in competent bedrock. 2. No groundwater encountered. 3. No visual or olfactory evidence of contamination. 4. Trial pit was stable. 5. Trial pit was backfilled with arisings on completion.

GL (m AOD) 55.22

Easting: 445920.38

Northing: 406231.70

Fig No. TP17

TRIAL PIT RECORD

TP No. **TP18** Sheet 1 of 1

Site: School Street (Phase 3), Thurnscoe

Contract No: C8023

Client: Keepmoat Homes

Date: 11/09/2018

Method: JCB 3CX with 2 foot toothed bucket.

Scale: 1:25

Logged By: RC | Checked By: GH

SAMPLE DETAILS				STRATA RECORD				
Type	Depth From - To(m)	Vane Results (kN/m2) (ppm)	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
ES	0.10			Dark brown, slightly clayey slightly organic SAND with frequent roots, rootlets and traces. [TOPSOIL]	0.30	53.76		
D	0.50			Very stiff, grey mottled light brown slightly gravelly slightly sandy CLAY. Intermediate plasticity. Friable. Gravel is fine to coarse, angular to tabular of siltstone. [RESIDUAL PENNINE UPPER COAL MEASURES FORMATION]				
				End of trial pit at 1.40m	1.40	52.66		

Remarks and Groundwater Observations

1. Terminated in natural ground at 1.4m bgl. 2. No groundwater encountered. 3. No visual or olfactory evidence of contamination. 4. Trial pit was stable. 5. Trial pit was backfilled with arisings on completion.

GL (m AOD) 54.06

Easting: 445869.53

Northing: 406236.29

Fig No. TP18

TRIAL PIT RECORD

TP No. **TP19** Sheet 1 of 1

Site: School Street (Phase 3), Thurnscoe

Contract No: C8023

Client: Keepmoat Homes

Date: 11/09/2018

Method: JCB 3CX with 2 foot toothed bucket.

Scale: 1:25

Logged By: RC Checked By: GH

SAMPLE DETAILS				STRATA RECORD				
Type	Depth From - To(m)	Vane Results (kN/m2) (ppm)	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
ES	0.20			Dark brown, slightly clayey slightly organic SAND with frequent roots, rootlets and traces. [TOPSOIL]	0.40	50.00		
D	0.70			Very stiff, grey mottled light brown slightly gravelly slightly sandy CLAY. Low plasticity (field description). Friable. Gravel is fine to coarse, angular to tabular of siltstone. [RESIDUAL PENNINE UPPER COAL MEASURES FORMATION]	1.00	49.40		
D	1.60			Extremely weak, distinctly weathered, grey SILTSTONE. Recovered as fine to coarse, angular to tabular gravel. [PENNINE UPPER COAL MEASURES FORMATION]	1.60	48.80		
				End of trial pit at 1.60m				

Remarks and Groundwater Observations

1. Terminated at 1.6m bgl in competent bedrock. 2. No groundwater encountered. 3. No visual or olfactory evidence of contamination. 4. Trial pit was stable. 5. Trial pit was backfilled with arisings on completion.

GL (m AOD) 50.40

Easting: 445770.25

Northing: 406237.40

Fig No. TP19

TRIAL PIT RECORD

TP No. **TP20** Sheet 1 of 1

Site: School Street (Phase 3), Thurnscoe

Contract No: C8023

Client: Keepmoat Homes

Date: 11/09/2018

Method: JCB 3CX with 2 foot toothed bucket.

Scale: 1:25

Logged By: RC Checked By: GH

SAMPLE DETAILS				STRATA RECORD				
Type	Depth From - To(m)	Vane Results (kN/m2) (ppm)	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
ES	0.30			Dark brown, slightly clayey slightly organic SAND with frequent roots, rootlets and traces. [TOPSOIL]	0.30	48.45		
D	1.00			Very stiff grey mottled brown gravelly CLAY with rootlets and traces. Low plasticity (field description). Friable. Gravel is fine to coarse, angular to tabular of siltstone. [RESIDUAL PENNINE UPPER COAL MEASURES FORMATION]				
				Extremely weak, distinctly weathered, grey SILTSTONE. Recovered as fine to coarse, angular to tabular gravel. [PENNINE UPPER COAL MEASURES FORMATION]	1.20	47.55		
				End of trial pit at 1.50m	1.50	47.25		

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2
3
4
5

Remarks and Groundwater Observations

1. Terminated at 1.5m bgl in competent bedrock. 2. No groundwater encountered. 3. No visual or olfactory evidence of contamination. 4. Trial pit was stable. 5. Trial pit was backfilled with arisings on completion.

GL (m AOD) 48.75

Easting: 445719.27

Northing: 406239.60

Fig No. TP20

TRIAL PIT RECORD

TP No. **TP21** Sheet 1 of 1

Site: School Street (Phase 3), Thurnscoe

Contract No: C8023

Client: Keepmoat Homes

Date: 12/09/2018

Method: JCB 3CX with 2 foot toothed bucket.

Scale: 1:25

Logged By: RC | Checked By: GH

SAMPLE DETAILS				STRATA RECORD				
Type	Depth From - To(m)	Vane Results (kN/m2) (ppm)	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
ES	0.20			Dark brown, slightly clayey slightly organic SAND with frequent roots, rootlets and traces. [TOPSOIL]	0.30	56.42		
				Very stiff, dark brown slightly gravelly CLAY with common roots, rootlets and traces. Low plasticity (field description). Friable. Gravel is fine to coarse, sub-rounded of siltstone and sandstone. [RESIDUAL PENNINE UPPER COAL MEASURES FORMATION]	0.60	56.12		
D	1.10			Very stiff, light yellowish brown gravelly CLAY. Intermediate plasticity. Friable. Gravel is fine to coarse, angular to tabular of siltstone. [RESIDUAL PENNINE UPPER COAL MEASURES FORMATION]				
				End of trial pit at 1.60m	1.60	55.12		

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Remarks and Groundwater Observations

1. Terminated in natural ground at 1.6m bgl. 2. No groundwater encountered. 3. No visual or olfactory evidence of contamination. 4. Trial pit was stable. 5. Trial pit was backfilled with arisings on completion.

GL (m AOD) 56.72

Easting: 445726.04

Northing: 406418.31

Fig No. TP21

TRIAL PIT RECORD

TP No. **TP22** Sheet 1 of 1

Site: School Street (Phase 3), Thurnscoe

Contract No: C8023

Client: Keepmoat Homes

Date: 12/09/2018

Method: JCB 3CX with 2 foot toothed bucket.

Scale: 1:25

Logged By: RC Checked By: GH

SAMPLE DETAILS				STRATA RECORD				
Type	Depth From - To(m)	Vane Results (kN/m2) (ppm)	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
ES	0.20			Dark brown, slightly clayey slightly organic SAND with frequent roots, rootlets and traces. [TOPSOIL]				
B	0.40 - 0.70			Stiff, light yellowish brown slightly gravelly slightly sandy CLAY with rootlets and traces. Low plasticity (field description). Friable. Gravel is fine to coarse, angular to tabular of siltstone and sandstone. [RESIDUAL PENNINE UPPER COAL MEASURES FORMATION]	0.40	53.29		
				Extremely weak, partially weathered, brown fine to medium grained SANDSTONE. Recovered as fine to coarse, angular to tabular gravel with low to moderate cobble content. [PENNINE UPPER COAL MEASURES FORMATION]	1.30 1.40	52.39 52.29		
				End of trial pit at 1.40m				

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Remarks and Groundwater Observations

1. Terminated at 1.4m bgl in competent bedrock. 2. No groundwater encountered. 3. No visual or olfactory evidence of contamination. 4. Trial pit was stable. 5. Trial pit was backfilled with arisings on completion.

GL (m AOD) 53.69

Easting: 445827.56

Northing: 406408.59

Fig No. TP22

TRIAL PIT RECORD

TP No. **TP23** Sheet 1 of 1

Site: School Street (Phase 3), Thurnscoe

Contract No: C8023

Client: Keepmoat Homes

Date: 12/09/2018

Method: JCB 3CX with 2 foot toothed bucket.

Scale: 1:25

Logged By: RC Checked By: GH

SAMPLE DETAILS			STRATA RECORD				
Type	Depth From - To(m)	Vane Results (kN/m2) (ppm)	Ground -water	Description	Depth (m)	Level (m AOD)	Legend / Backfill
ES	0.30			Dark brown, slightly clayey slightly organic SAND with frequent roots, rootlets and traces. [TOPSOIL]	0.40	50.81	
				Stiff, grey, mottled brown slightly gravelly CLAY. Low plasticity (field description). Friable. Gravel is fine to coarse, angular to tabular of siltstone. [RESIDUAL PENNINE UPPER COAL MEASURES FORMATION]			
D	1.30	80.0 87.0 110.0		Very stiff high strength grey mottled light brown, slightly gravelly CLAY. Intermediate plasticity. Gravel is fine to coarse, angular to tabular of siltstone and carbonaceous material. [RESIDUAL PENNINE UPPER COAL MEASURES FORMATION]	1.60	49.61	
D	2.00			End of trial pit at 2.00m	2.00	49.21	

Remarks and Groundwater Observations

1. Terminated in natural ground at 2.0m bgl due to slow progress. 2. No groundwater encountered. 3. No visual or olfactory evidence of contamination. 4. Trial pit was stable. 5. Trial pit was backfilled with arisings on completion.

GL (m AOD) 51.21

Easting: 445895.88

Northing: 406374.69

Fig No. TP23

TRIAL PIT RECORD

TP No. **TP24** Sheet 1 of 1

Site: School Street (Phase 3), Thurnscoe

Contract No: C8023

Client: Keepmoat Homes

Date: 12/09/2018

Method: JCB 3CX with 2 foot toothed bucket.

Scale: 1:25

Logged By: RC Checked By: GH

SAMPLE DETAILS				STRATA RECORD				
Type	Depth From - To(m)	Vane Results (kN/m2) (ppm)	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
ES	0.20			Dark brown, slightly clayey slightly organic SAND with frequent roots, rootlets and traces. [TOPSOIL]	0.35	52.31		
				Very stiff grey mottled brown gravelly CLAY with rootlets and traces. Low plasticity (field description). Friable. Gravel is fine to coarse, angular to tabular of siltstone. [RESIDUAL PENNINE UPPER COAL MEASURES FORMATION]	0.80	51.86		
D	0.90			Very stiff grey gravelly CLAY. High plasticity. Friable. Gravel is fine to coarse, angular to tabular of siltstone. [RESIDUAL PENNINE UPPER COAL MEASURES FORMATION]	1.30	51.36		
				Extremely weak, distinctly weathered, grey SILTSTONE. Recovered as fine to coarse, angular to tabular gravel. [PENNINE UPPER COAL MEASURES FORMATION]	1.70	50.96		
				End of trial pit at 1.70m				

Remarks and Groundwater Observations

1. Terminated at 1.7m bgl in competent bedrock. 2. No groundwater encountered. 3. No visual or olfactory evidence of contamination. 4. Trial pit was stable. 5. Trial pit was backfilled with arisings on completion.

GL (m AOD) 52.66

Easting: 445846.23

Northing: 406370.50

Fig No. TP24

TRIAL PIT RECORD

TP No. **TP25** Sheet 1 of 1

Site: School Street (Phase 3), Thurnscoe

Contract No: C8023

Client: Keepmoat Homes

Date: 12/09/2018

Method: JCB 3CX with 2 foot toothed bucket.

Scale: 1:25

Logged By: RC | Checked By: GH

SAMPLE DETAILS				STRATA RECORD				
Type	Depth From - To(m)	Vane Results (kN/m2) (ppm)	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
ES	0.20			Dark brown, slightly clayey slightly organic SAND with frequent roots, rootlets and traces. [TOPSOIL]	0.30	52.81		
D	1.10			Very stiff grey mottled light brown slightly gravelly CLAY. Low plasticity (field description). Friable. Gravel is fine to coarse, angular to tabular of siltstone and carbonaceous mudstone. [RESIDUAL PENNINE UPPER COAL MEASURES FORMATION]	1.20	51.91		
				Extremely weak, distinctly weathered, grey SILTSTONE. Recovered as fine to coarse, angular to tabular gravel. [PENNINE UPPER COAL MEASURES FORMATION]	1.60	51.51		
				End of trial pit at 1.60m				

Remarks and Groundwater Observations

1. Terminated at 1.6m bgl in competent bedrock. 2. No groundwater encountered. 3. No visual or olfactory evidence of contamination. 4. Trial pit was stable. 5. Trial pit was backfilled with arisings on completion.

GL (m AOD) 53.11

Easting: 445797.67

Northing: 406376.64

Fig No. TP25

TRIAL PIT RECORD

TP No. **TP26** Sheet 1 of 1

Site: School Street (Phase 3), Thurnscoe

Contract No: C8023

Client: Keepmoat Homes

Date: 12/09/2018

Method: JCB 3CX with 2 foot toothed bucket.

Scale: 1:25

Logged By: RC Checked By: GH

SAMPLE DETAILS				STRATA RECORD				
Type	Depth From - To(m)	Vane Results (kN/m2) (ppm)	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
ES	0.20			Dark brown, slightly clayey slightly organic SAND with frequent roots, rootlets and traces. [TOPSOIL]				
B	0.40 - 0.60			Very stiff grey mottled light brown slightly gravelly CLAY. Low plasticity (field description). Friable. Gravel is fine to coarse, angular to tabular of siltstone and carbonaceous mudstone. [RESIDUAL PENNINE UPPER COAL MEASURES FORMATION]	0.35	53.88		
D	1.50			Extremely weak, distinctly weathered, grey SILTSTONE. Recovered as fine to coarse, angular to tabular gravel. [PENNINE UPPER COAL MEASURES FORMATION]	1.30 1.50	52.93 52.73		
				End of trial pit at 1.50m				

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Remarks and Groundwater Observations

1. Terminated at 1.5m bgl in competent bedrock. 2. No groundwater encountered. 3. No visual or olfactory evidence of contamination. 4. Trial pit was stable. 5. Trial pit was backfilled with arisings on completion.

GL (m AOD) 54.23

Easting: 445748.91

Northing: 406372.96

Fig No. TP26

TRIAL PIT RECORD

TP No. **TP27** Sheet 1 of 1

Site: School Street (Phase 3), Thurnscoe

Contract No: C8023

Client: Keepmoat Homes

Date: 12/09/2018

Method: JCB 3CX with 2 foot toothed bucket.

Scale: 1:25

Logged By: RC Checked By: GH

SAMPLE DETAILS				STRATA RECORD				
Type	Depth From - To(m)	Vane Results (kN/m2) (ppm)	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
ES	0.10			Dark brown, slightly clayey slightly organic SAND with frequent roots, rootlets and traces. [TOPSOIL]	0.25	55.57		
D	0.70			Very stiff grey mottled light brown slightly gravelly CLAY. Low plasticity (field description). Friable. Gravel is fine to coarse, angular to tabular of siltstone and carbonaceous mudstone. [RESIDUAL PENNINE UPPER COAL MEASURES FORMATION]				
				Extremely weak, distinctly weathered, grey SILTSTONE. Recovered as fine to coarse, angular to tabular gravel with low cobble content. [PENNINE UPPER COAL MEASURES FORMATION]	1.20	54.62		
				End of trial pit at 1.70m	1.70	54.12		

Remarks and Groundwater Observations

1. Terminated at 1.7m bgl in competent bedrock. 2. No groundwater encountered. 3. No visual or olfactory evidence of contamination. 4. Trial pit was stable. 5. Trial pit was backfilled with arisings on completion.

GL (m AOD) 55.82

Easting: 445698.12

Northing: 406373.01

Fig No. TP27

TRIAL PIT RECORD

TP No. **TP28** Sheet 1 of 1

Site: School Street (Phase 3), Thurnscoe

Contract No: C8023

Client: Keepmoat Homes

Date: 12/09/2018

Method: JCB 3CX with 2 foot toothed bucket.

Scale: 1:25

Logged By: RC Checked By: GH

SAMPLE DETAILS				STRATA RECORD				
Type	Depth From - To(m)	Vane Results (kN/m2) (ppm)	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
ES	0.30			Dark brown, slightly clayey slightly organic SAND with frequent roots, rootlets and traces. [TOPSOIL]	0.40	51.92		
				Very stiff light yellowish brown slightly gravelly CLAY. Low plasticity (field description). Friable. Gravel is fine to coarse, angular to tabular of siltstone. [RESIDUAL PENNINE UPPER COAL MEASURES FORMATION]	0.80	51.52		
D	0.90			Stiff grey mottled light brown slightly gravelly CLAY. Low plasticity (field description). Friable. Gravel is fine to coarse, angular to tabular of siltstone. [RESIDUAL PENNINE UPPER COAL MEASURES FORMATION]				
				End of trial pit at 1.60m	1.60	50.72		

1 2 3 4 5

Remarks and Groundwater Observations

1. Terminated in natural ground at 1.6m bgl. 2. No groundwater encountered. 3. No visual or olfactory evidence of contamination. 4. Trial pit was stable. 5. Trial pit was backfilled with arisings on completion.

GL (m AOD) 52.32

Easting: 445777.02

Northing: 406332.33

Fig No. TP28

TRIAL PIT RECORD

TP No. **TP29** Sheet 1 of 1

Site: School Street (Phase 3), Thurnscoe	Contract No: C8023
Client: Keepmoat Homes	Date: 12/09/2018
Method: JCB 3CX with 2 foot toothed bucket.	Scale: 1:25
	Logged By: RC — Checked By: GH

SAMPLE DETAILS				STRATA RECORD				
Type	Depth From - To(m)	Vane Results (kN/m2) (ppm)	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
ES	0.10			Dark brown, slightly clayey slightly organic SAND with frequent roots, rootlets and traces. [TOPSOIL]	0.30	50.99		
B	0.50 - 0.80			Very stiff grey mottled light brown slightly gravelly CLAY. Low plasticity (field description). Friable. Gravel is fine to coarse, angular to tabular of siltstone. [RESIDUAL PENNINE UPPER COAL MEASURES FORMATION]	1.00	50.29		
D	1.30			Very stiff grey mottled light brown slightly gravelly CLAY. Low plasticity (field description). Friable. Gravel is fine to coarse, angular to tabular of siltstone. [RESIDUAL PENNINE UPPER COAL MEASURES FORMATION]	1.40	49.89		
				End of trial pit at 1.40m				

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Remarks and Groundwater Observations

1. Terminated in natural ground at 1.4m bgl. 2. No groundwater encountered. 3. No visual or olfactory evidence of contamination. 4. Trial pit was stable. 5. Trial pit was backfilled with arisings on completion.

GL (m AOD) 51.29
Easting: 445825.02
Northing: 406330.41

Fig No. TP29

TRIAL PIT RECORD

TP No. **TP30** Sheet 1 of 1

Site: School Street (Phase 3), Thurnscoe

Contract No: C8023

Client: Keepmoat Homes

Date: 12/09/2018

Method: JCB 3CX with 2 foot toothed bucket.

Scale: 1:25

Logged By: RC Checked By: GH

SAMPLE DETAILS				STRATA RECORD				
Type	Depth From - To(m)	Vane Results (kN/m2) (ppm)	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
ES	0.20			Dark brown, slightly clayey slightly organic SAND with frequent roots, rootlets and traces. [TOPSOIL]	0.30	53.03		
D	0.90			Very stiff grey mottled light brown slightly gravelly slightly sandy CLAY. Intermediate plasticity. Friable. Gravel is fine to coarse, angular to tabular of siltstone. [RESIDUAL PENNINE UPPER COAL MEASURES FORMATION]				
				Extremely weak, distinctly weathered, grey SILTSTONE. Recovered as fine to coarse, angular to tabular gravel. [PENNINE UPPER COAL MEASURES FORMATION]	1.10	52.23		
				End of trial pit at 1.60m	1.60	51.73		

Remarks and Groundwater Observations

1. Terminated at 1.6m bgl in competent bedrock. 2. No groundwater encountered. 3. No visual or olfactory evidence of contamination. 4. Trial pit was stable. 5. Trial pit was backfilled with arisings on completion.

GL (m AOD) 53.33

Easting: 445926.42

Northing: 406324.15

Fig No. TP30

TRIAL PIT RECORD

TP No. **TP31** Sheet 1 of 1

Site: School Street (Phase 3), Thurnscoe	Contract No: C8023
Client: Keepmoat Homes	Date: 19/09/2018
Method: JCB 3CX with 2 foot toothed bucket.	Scale: 1:25
	Logged By: RC — Checked By:

SAMPLE DETAILS | STRATA RECORD

Type	Depth From - To(m)	Vane Results (kN/m2) (ppm)	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
				Dark brown, slightly clayey slightly organic SAND with frequent roots, rootlets and traces. [TOPSOIL]	0.35	47.42		
				Stiff, grey mottled yellowish brown gravelly CLAY. Low plasticity (field description). Friable. Gravel is fine to coarse, sub-angular of siltstone. [RESIDUAL PENNINE UPPPER COAL MEASURES FORMATION]				
ES	1.20			Extremely weak, distinctly weathered, greyish brown SILTSTONE. Recovered as slightly clayey angular to tabular gravel. [PENNINE UPPER COAL MEASURES FORMATION]	1.10	46.67		
				End of trial pit at 1.30m	1.30	46.47		

1 2 3 4 5

Remarks and Groundwater Observations

1. Terminated at 1.3m bgl in competent bedrock. 2. No groundwater encountered. 3. No visual or olfactory evidence of contamination. 4. Trial pit was stable. 5. Trial pit was backfilled with arisings on completion.

GL (m AOD) 47.77
Easting: 445651.37
Northing: 406199.60

Fig No. TP31

TRIAL PIT RECORD

TP No. **TP32** Sheet 1 of 1

Site: School Street (Phase 3), Thurnscoe

Contract No: C8023

Client: Keepmoat Homes

Date: 19/09/2018

Method: JCB 3CX with 2 foot toothed bucket.

Scale: 1:25

Logged By: RC

Checked By:

SAMPLE DETAILS				STRATA RECORD				
Type	Depth From - To(m)	Vane Results (kN/m2) (ppm)	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
				Dark brown, slightly clayey slightly organic SAND with frequent roots, rootlets and traces. [TOPSOIL]				
				Stiff, light yellowish brown slightly gravelly CLAY with roots and traces. Low plasticity (field description). Friable. Gravel is fine to coarse, sub-angular of siltstone. [RESIDUAL PENNINE UPPER COAL MEASURES FORMATION]	0.40	54.41		
				Very stiff, pale grey mottled light brown gravelly CLAY. Low plasticity (field description). Friable. Gravel is fine to coarse, sub-angular of siltstone. [RESIDUAL PENNINE UPPER COAL MEASURES FORMATION]	0.60	54.21		
ES	1.00		1	End of trial pit at 1.10m	1.10	53.71		
			2					
			3					
			4					
			5					

Remarks and Groundwater Observations

1. Terminated in natural ground at 1.1m bgl. 2. No groundwater encountered. 3. No visual or olfactory evidence of contamination. 4. Trial pit was stable. 5. Trial pit was backfilled with arisings on completion.

GL (m AOD) 54.81

Easting: 445677.55

Northing: 406323.25

Fig No. TP32

TRIAL PIT RECORD

TP No. **TP33** Sheet 1 of 1

Site: School Street (Phase 3), Thurnscoe

Contract No: C8023

Client: Keepmoat Homes

Date: 19/09/2018

Method: JCB 3CX with 2 foot toothed bucket.

Scale: 1:25

Logged By: RC

Checked By:

SAMPLE DETAILS

STRATA RECORD

Type	Depth From - To(m)	Vane Results (kN/m2) (ppm)	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
				Dark brown, slightly clayey slightly organic SAND with frequent roots, rootlets and traces. [TOPSOIL]	0.30	53.25		
ES	0.70			Pale greyish brown yellow sandy GRAVEL. Gravel is fine to coarse, sub-angular to tabular of sandstone. [RESIDUAL PENNINE UPPER COAL MEASURES FORMATION]				
				End of trial pit at 0.80m	0.80	52.75		

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Remarks and Groundwater Observations

1. Terminated in natural ground at 0.8m bgl. 2. No groundwater encountered. 3. No visual or olfactory evidence of contamination. 4. Trial pit was stable. 5. Trial pit was backfilled with arisings on completion.

GL (m AOD) 53.55

Easting: 445854.76

Northing: 406401.04

Fig No. TP33

TRIAL PIT RECORD

TP No. **TP34** Sheet 1 of 1

Site: School Street (Phase 3), Thurnscoe

Contract No: C8023

Client: Keepmoat Homes

Date: 19/09/2018

Method: JCB 3CX with 2 foot toothed bucket.

Scale: 1:25

Logged By: RC

Checked By:

SAMPLE DETAILS | STRATA RECORD

Type	Depth From - To(m)	Vane Results (kN/m2) (ppm)	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
				Dark brown, slightly clayey slightly organic SAND with frequent roots, rootlets and traces. [TOPSOIL]	0.30	53.01		
				Stiff, light yellowish brown slightly gravelly CLAY with roots and traces. Low plasticity (field description). Friable. Gravel is fine to coarse, angular to tabular of sandstone. [RESIDUAL PENNINE UPPER COAL MEASURES FORMATION]	0.70	52.61		
				Pale brown sandy GRAVEL. Gravel is fine to coarse, angular to tabular of sandstone. [RESIDUAL PENNINE UPPER COAL MEASURES FORMATION]				
ES	1.30			End of trial pit at 1.30m	1.30	52.01		

1 2 3 4 5

Remarks and Groundwater Observations

1. Terminated in natural ground at 1.3m bgl. 2. No groundwater encountered. 3. No visual or olfactory evidence of contamination. 4. Trial pit was stable. 5. Trial pit was backfilled with arisings on completion.

GL (m AOD) 53.31

Easting: 445946.86

Northing: 406354.24

Fig No. TP34

TRIAL PIT RECORD

TP No. **TP35** Sheet 1 of 1

Site: School Street (Phase 3), Thurnscoe

Contract No: C8023

Client: Keepmoat Homes

Date: 19/09/2018

Method: JCB 3CX with 2 foot toothed bucket.

Scale: 1:25

Logged By: RC

Checked By:

SAMPLE DETAILS

STRATA RECORD

Type	Depth From - To(m)	Vane Results (kN/m2) (ppm)	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
				Dark brown, slightly clayey slightly organic SAND with frequent roots, rootlets and traces. [TOPSOIL]	0.30	52.19		
ES	0.80			Very stiff grey mottled light orangish brown gravelly CLAY with roots and traces. Low plasticity (field description). Friable. Gravel is fine to coarse, sub-angular of siltstone. [RESIDUAL PENNINE UPPPER COAL MEASURES FORMATION]				
				End of trial pit at 0.90m	0.90	51.59		

1
2
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4
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Remarks and Groundwater Observations

1. Terminated in natural ground at 0.9m bgl. 2. No groundwater encountered. 3. No visual or olfactory evidence of contamination. 4. Trial pit was stable. 5. Trial pit was backfilled with arisings on completion.

GL (m AOD) 52.49

Easting: 445870.67

Northing: 406277.85

Fig No. TP35

TRIAL PIT RECORD

TP No. **TP36** Sheet 1 of 1

Site: School Street (Phase 3), Thurnscoe

Contract No: C8023

Client: Keepmoat Homes

Date: 19/09/2018

Method: JCB 3CX with 2 foot toothed bucket.

Scale: 1:25

Logged By: RC

Checked By:

SAMPLE DETAILS

STRATA RECORD

Type	Depth From - To(m)	Vane Results (kN/m2) (ppm)	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
				Dark brown, slightly clayey slightly organic SAND with frequent roots, rootlets and traces. [TOPSOIL]	0.30	52.91		
				Very stiff light brown CLAY with roots and traces. Low plasticity (field description). Friable. [RESIDUAL PENNINE UPPPER COAL MEASURES FORMATION]				
ES	0.90			End of trial pit at 0.90m	0.90	52.31		

1
2
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4
5

Remarks and Groundwater Observations

1. Terminated in natural ground at 0.9m bgl. 2. No groundwater encountered. 3. No visual or olfactory evidence of contamination. 4. Trial pit was stable. 5. Trial pit was backfilled with arisings on completion.

GL (m AOD) 53.21

Easting: 445862.58

Northing: 406109.31

Fig No. TP36

TRIAL PIT RECORD

TP No. **HP01**
Sheet 1 of 1

Site: School Street (Phase 3), Thurnscoe
Contract No: C8023
Client: Keepmoat Homes
Date: 05/10/2018
Method: Hand Dug Pit
Scale: 1:25
Logged By: RC
Checked By: GH

SAMPLE DETAILS | STRATA RECORD

Type	Depth From - To(m)	Vane Results (kN/m2) (ppm)	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
ES	0.00 - 0.10			MADE GROUND: Vegetation over brown, slightly sandy, slightly gravelly, slightly organic CLAY with rootlets. Gravel is fine to medium, sub-rounded of brick. [REWORKED TOPSOIL]	0.10			
ES	0.10 - 0.35			Very stiff, grey, mottled brown, slightly gravelly CLAY. Gravel is fine to coarse, sub-angular of siltstone. [RESIDUAL PENNINE UPPER COAL MEASURES FORMATION]	0.35			
				End of trial pit at 0.35m				

1
2
3
4
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Remarks and Groundwater Observations

1. Shallow hand dug pit to 0.35m bgl. 2. No groundwater encountered. 3. No visual or olfactory evidence of contamination. 4. Hand pit was stable.

GL (m AOD)
Easting:
Northing:

Fig No.
HP01

TRIAL PIT RECORD

TP No. **HP02**
Sheet 1 of 1

Site: School Street (Phase 3), Thurnscoe
Contract No: C8023
Client: Keepmoat Homes
Date: 05/10/2018
Method: Hand Dug Pit
Scale: 1:25
Logged By: RC
Checked By: GH

SAMPLE DETAILS | STRATA RECORD

Type	Depth From - To(m)	Vane Results (kN/m2) (ppm)	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
ES	0.05 - 0.15			MADE GROUND: Pale brown gravelly CLAY. Gravel is fine to coarse, angular of brick, sandstone, concrete and mudstone.	0.05			
ES	0.15 - 0.30			MADE GROUND: Brown, slightly sandy, slightly gravelly, slightly organic CLAY with rootlets. Gravel is fine to medium, sub-rounded of brick. [REWORKED TOPSOIL]	0.15			
				Very stiff, brown, slightly gravelly CLAY with rootlets. Gravel is fine to coarse, sub-angular of siltstone. [RESIDUAL PENNINE UPPER COAL MEASURES FORMATION]	0.30			
				End of trial pit at 0.30m				

1
2
3
4
5

Remarks and Groundwater Observations

1. Shallow hand dug pit to 0.30m bgl. 2. No groundwater encountered. 3. No visual or olfactory evidence of contamination. 4. Hand pit was stable.

GL (m AOD)
Easting:
Northing:

Fig No.
HP02

TRIAL PIT RECORD

TP No. **HP03**
Sheet 1 of 1

Site: School Street (Phase 3), Thurnscoe
Contract No: C8023
Client: Keepmoat Homes
Date: 05/10/2018
Method: Hand Dug Pit
Scale: 1:25
Logged By: RC
Checked By: GH

SAMPLE DETAILS | STRATA RECORD

Type	Depth From - To(m)	Vane Results (kN/m2) (ppm)	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
ES	0.00 - 0.10			MADE GROUND: Vegetation over brown, slightly sandy, slightly gravelly, slightly organic CLAY with rootlets. Gravel is fine to medium, sub-rounded of brick and concrete. [REWORKED TOPSOIL]	0.10			
ES	0.10 - 0.30			Very stiff, grey, mottled brown, slightly gravelly CLAY. Gravel is fine to coarse, sub-angular of siltstone. [RESIDUAL PENNINE UPPER COAL MEASURES FORMATION]	0.30			
				End of trial pit at 0.30m				

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Remarks and Groundwater Observations

1. Shallow hand dug pit to 0.30m bgl. 2. No groundwater encountered. 3. No visual or olfactory evidence of contamination. 4. Hand pit was stable.

GL (m AOD)
Easting:
Northing:

Fig No.
HP03

TRIAL PIT RECORD

TP No. **HP04**
Sheet 1 of 1

Site: School Street (Phase 3), Thurnscoe
Contract No: C8023
Client: Keepmoat Homes
Date: 05/10/2018
Method: Hand Dug Pit
Scale: 1:25
Logged By: RC
Checked By: GH

SAMPLE DETAILS | STRATA RECORD

Type	Depth From - To(m)	Vane Results (kN/m2) (ppm)	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
ES	0.10 - 0.20			MADE GROUND: Grass over brown, slightly gravelly slightly organic CLAY with roots and rootlets. Gravel is fine to coarse, angular, of concrete and brick, with fragments of glass and plastic. [REWORKED TOPSOIL]	0.25	54.65		
				End of trial pit at 0.25m				

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Remarks and Groundwater Observations

1. Shallow hand dug pit to 0.25m bgl. 2. No groundwater encountered. 3. No visual or olfactory evidence of contamination. 4. Hand pit was stable.

GL (m AOD) 54.90
Easting:
Northing:

Fig No.
HP04

TRIAL PIT RECORD

TP No. **HP05**
Sheet 1 of 1

Site: School Street (Phase 3), Thurnscoe
Contract No: C8023
Client: Keepmoat Homes
Date: 05/10/2018
Method: Hand Dug Pit
Scale: 1:25
Logged By: RC
Checked By: GH

SAMPLE DETAILS				STRATA RECORD				
Type	Depth From - To(m)	Vane Results (kN/m2) (ppm)	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
ES	0.10 - 0.20			MADE GROUND: Grass over brown, slightly gravelly slightly organic CLAY with roots and rootlets. Gravel is fine to coarse, angular, of concrete and brick. [REWORKED TOPSOIL]	0.20	55.60		
				End of trial pit at 0.20m				

1
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Remarks and Groundwater Observations

1. Shallow hand dug pit to 0.20m bgl. 2. No groundwater encountered. 3. No visual or olfactory evidence of contamination. 4. Hand pit was stable.

GL (m AOD) 55.80
Easting:
Northing:

Fig No.
HP05

WINDOW SAMPLING RECORD

BH No. **WS01**
Sheet 1 of 1

Site: School Street (Phase 3), Thurnscoe
Contract No: C8023
Client: Keepmoat Homes
Date: 13/09/2018
Method: Window Sampler Rig
Scale: 1:30
Logged By: RC
Checked By: GH
Driller: RP Drilling

SAMPLE DETAILS				STRATA RECORD				
Type	Depth From - To(m)	SPT (N), (ppm), Vane Result (kN/m2)	Ground-water	Description	Depth (m)	Level (m AOD)	Legend	Well
ES	0.00 - 0.30			Dark brown, slightly clayey slightly organic SAND with frequent roots, rootlets and traces. [TOPSOIL]	0.20	55.04		
				Very stiff, pale grey, mottled light brown, slightly sandy slightly gravelly CLAY with occasional root traces. Low plasticity (field description). Friable. Gravel is fine to coarse, sub-angular of sandstone. [RESIDUAL PENNINE UPPER COAL MEASURES FORMATION]	0.60	54.64		
D	1.00 - 1.40	N=40 (6,8/9,9,10,12)		Pale grey, mottled light brown sandy GRAVEL. Gravel is fine to coarse, angular to tabular of sandstone. [RESIDUAL PENNINE UPPER COAL MEASURES FORMATION]	0.90	54.34		
		50 (25 for 125mm/50 for 60mm)		Very stiff, grey, very high strength, mottled brown, slightly gravelly slightly sandy CLAY. Low plasticity (field description). Friable. Gravel is fine to coarse, sub-angular of sandstone. [RESIDUAL PENNINE UPPER COAL MEASURES FORMATION]	1.40	53.84		
				End of Borehole at 1.40m				

1
2
3
4
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6

Remarks and Groundwater Observations:

1. Borehole was terminated on refusal within natural ground at 1.4m bgl. 2. No visual or olfactory evidence of contamination was encountered. 3. No groundwater was encountered. 4. Borehole installed with 63mm pipework as detailed above.

GL (m AOD)
55.24m AOD
Easting:
445766.12
Northing:
406411.93

Fig No.
WS01

WINDOW SAMPLING RECORD

BH No. **WS02**
Sheet 1 of 1

Site: School Street (Phase 3), Thurnscoe
Contract No: C8023
Client: Keepmoat Homes
Date: 13/09/2018
Method: Window Sampler Rig
Scale: 1:30
Logged By: RC
Checked By: GH
Driller: RP Drilling

SAMPLE DETAILS				STRATA RECORD				
Type	Depth From - To(m)	SPT (N), (ppm), Vane Result (kN/m2)	Ground-water	Description	Depth (m)	Level (m AOD)	Legend	Well
ES	0.00 - 0.30			Dark brown, slightly clayey slightly organic SAND with frequent roots, rootlets and traces. [TOPSOIL]	0.30	53.55		
				Very stiff, pale grey, mottled light brown, slightly sandy slightly gravelly CLAY with occasional root traces. Low plasticity (field description). Friable. Gravel is fine to coarse, sub-angular of siltstone. [RESIDUAL PENNINE UPPER COAL MEASURES FORMATION]	0.90	52.95		
		N=24 (3,4/5,5,6,8)	1	Very stiff, pale grey, high strength slightly sandy slightly gravelly CLAY. Low plasticity (field description). Friable. Gravel is fine to coarse, sub-angular of sandstone. [RESIDUAL PENNINE UPPER COAL MEASURES FORMATION]				
D	1.80 - 2.00				1.80	52.05		
		50 (8,10/50 for 50mm)	2	Very stiff, grey, slightly sandy gravelly CLAY. Low plasticity (field description). Friable. Gravel is fine to coarse, angular of siltstone. [RESIDUAL PENNINE UPPER COAL MEASURES FORMATION]	2.00	51.85		
				End of Borehole at 2.00m				
			3					
			4					
			5					
			6					

Remarks and Groundwater Observations:

1. Borehole was terminated on refusal within natural ground at 2.0m bgl. 2. No visual or olfactory evidence of contamination was encountered. 3. No groundwater was encountered. 4. Borehole installed with 63mm pipework as detailed above.

GL (m AOD)
53.85m AOD
Easting:
445722.90
Northing:
406328.61

Fig No.
WS02

WINDOW SAMPLING RECORD

BH No. **WS03**
Sheet 1 of 1

Site: School Street (Phase 3), Thurnscoe
Contract No: C8023
Client: Keepmoat Homes
Date: 13/09/2018
Method: Window Sampler Rig
Scale: 1:30
Logged By: RC
Checked By: GH
Driller: RP Drilling

SAMPLE DETAILS				STRATA RECORD				
Type	Depth From - To(m)	SPT (N), (ppm), Vane Result (kN/m2)	Ground-water	Description	Depth (m)	Level (m AOD)	Legend	Well
ES	0.00 - 0.30			Dark brown, slightly clayey slightly organic SAND with frequent roots, rootlets and traces. [TOPSOIL]				
				Very stiff, brown, high strength, gravelly CLAY. Low plasticity (field description). Friable. Gravel is fine to coarse, sub-angular of siltstone. [RESIDUAL PENNINE UPPER COAL MEASURES FORMATION]	0.35	48.87		
D	0.80 - 1.00	N=29 (5,5/6,7,8,8)	1					
D	1.80 - 2.00			Extremely weak, distinctly weathered, dark brown SILTSTONE. Recovered as sandy angular gravel. [PENNINE UPPER COAL MEASURES FORMATION]	1.80	47.42		
		50 (8,12/50 for 135mm)	2	End of Borehole at 2.00m	2.00	47.22		
			3					
			4					
			5					
			6					

Remarks and Groundwater Observations:

1. Borehole was terminated on refusal within competent bedrock at 2.0m bgl. 2. No visual or olfactory evidence of contamination was encountered. 3. No groundwater was encountered. 4. Borehole installed with 63mm pipework as detailed above.

GL (m AOD)
49.22m AOD
Easting:
445693.49
Northing:
406239.31

Fig No.
WS03

WINDOW SAMPLING RECORD

BH No. **WS04**
Sheet 1 of 1

Site: School Street (Phase 3), Thurnscoe
Contract No: C8023
Client: Keepmoat Homes
Date: 13/09/2018
Method: Window Sampler Rig
Scale: 1:30
Logged By: RC
Checked By: GH
Driller: RP Drilling

SAMPLE DETAILS				STRATA RECORD				
Type	Depth From - To(m)	SPT (N), (ppm), Vane Result (kN/m2)	Ground-water	Description	Depth (m)	Level (m AOD)	Legend	Well
ES	0.00 - 0.30			Dark brown, slightly clayey slightly organic SAND with frequent roots, rootlets and traces. [TOPSOIL]	0.20	53.94		
				Very stiff, grey mottled brown gravelly CLAY. Low plasticity (field description). Friable. Gravel is fine to coarse, sub-angular of siltstone. [RESIDUAL PENNINE UPPER COAL MEASURES FORMATION]				
D	0.80 - 1.00							
		50 (4,4/50 for 295mm)		End of Borehole at 1.00m	1.00	53.14		

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Remarks and Groundwater Observations:

1. Borehole was terminated on refusal within natural ground at 1.0m bgl. 2. No visual or olfactory evidence of contamination was encountered. 3. No groundwater was encountered. 4. Borehole installed with 63mm pipework as detailed above.

GL (m AOD)
54.14m AOD
Easting:
445819.72
Northing:
406236.47

Fig No.
WS04

WINDOW SAMPLING RECORD

BH No. **WS05** Sheet 1 of 1

Site: School Street (Phase 3), Thurnscoe

Contract No: C8023

Client: Keepmoat Homes

Date: 13/09/2018

Method: Window Sampler Rig

Scale: 1:30

Logged By: RC | Checked By: GH

Driller: RP Drilling

SAMPLE DETAILS				STRATA RECORD				
Type	Depth From - To(m)	SPT (N), (ppm), Vane Result (kN/m2)	Ground-water	Description	Depth (m)	Level (m AOD)	Legend	Well
ES	0.00 - 0.30			Dark brown, slightly clayey slightly organic SAND with frequent roots, rootlets and traces. [TOPSOIL]				
					0.35	50.31		
D	0.60 - 0.80			Very stiff, grey mottled brown, high strength gravelly CLAY. Low plasticity (field description). Friable. Gravel is fine to coarse, sub-angular of siltstone. [RESIDUAL PENNINE UPPER COAL MEASURES FORMATION]				
		N=15 (3,3/3,4,4,4)	1					
				Extremely weak, distinctly weathered, grey SILTSTONE. Recovered as clayey fine to coarse, angular to tabular gravel. [PENNINE UPPER COAL MEASURES FORMATION]	1.60	49.06		
		50 (25 for 50mm/50 for 20mm)	2	End of Borehole at 2.00m	2.00	48.66		
			3					
			4					
			5					
			6					

Remarks and Groundwater Observations:

1. Borehole was terminated on refusal within competent bedrock at 2.0m bgl. 2. No visual or olfactory evidence of contamination was encountered. 3. No groundwater was encountered. 4. Borehole installed with 63mm pipework as detailed above.

GL (m AOD) 50.66m AOD

Easting: 445865.22

Northing: 406332.34

Fig No. WS05

WINDOW SAMPLING RECORD

BH No. **WS06**
Sheet 1 of 1

Site: School Street (Phase 3), Thurnscoe
Contract No: C8023
Client: Keepmoat Homes
Date: 13/09/2018
Method: Window Sampler Rig
Scale: 1:30
Logged By: RC
Checked By: GH
Driller: RP Drilling

SAMPLE DETAILS | STRATA RECORD

Type	Depth From - To(m)	SPT (N), (ppm), Vane Result (kN/m2)	Ground-water	Description	Depth (m)	Level (m AOD)	Legend	Well
ES	0.00 - 0.30			Dark brown, slightly clayey slightly organic SAND with frequent roots, rootlets and traces. [TOPSOIL]	0.30	53.37		
D	0.50 - 0.70			Grey, mottled light brown, gravelly slightly clayey SAND. Gravel is fine to coarse, sub-angular of sandstone. [RESIDUAL PENNINE UPPER COAL MEASURES FORMATION]	0.70	52.97		
		50 (25 for 20mm/50 for 5mm)		Very weak, partially weathered, pale grey, mottled light brown fine to medium grained SANDSTONE. Recovered as sandy angular gravel. [PENNINE UPPER COAL MEASURES FORMATION]	0.80	52.87		
				End of Borehole at 0.80m				

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Remarks and Groundwater Observations:

1. Borehole was terminated on refusal within competent bedrock at 0.8m bgl. 2. No visual or olfactory evidence of contamination was encountered. 3. No groundwater was encountered. 4. Borehole installed with 63mm pipework as detailed above.

GL (m AOD) 53.67m AOD
Easting: 445968.79
Northing: 406337.34

Fig No. WS06

WINDOW SAMPLING RECORD

BH No. **WS07**
Sheet 1 of 1

Site: School Street (Phase 3), Thurnscoe
Contract No: C8023
Client: Keepmoat Homes
Date: 13/09/2018
Method: Window Sampler Rig
Scale: 1:30
Logged By: RC
Checked By: GH
Driller: RP Drilling

SAMPLE DETAILS				STRATA RECORD				
Type	Depth From - To(m)	SPT (N), (ppm), Vane Result (kN/m2)	Ground-water	Description	Depth (m)	Level (m AOD)	Legend	Well
ES	0.00 - 0.30			Dark brown, slightly clayey slightly organic SAND with frequent roots, rootlets and traces. [TOPSOIL]	0.30	55.51		
D	0.60 - 0.80			Grey, mottled light brown, gravelly slightly clayey SAND. Gravel is fine to coarse, sub-angular of sandstone. [RESIDUAL PENNINE UPPER COAL MEASURES FORMATION]	0.90	54.91		
		50 (25 for 85mm/50 for 125mm)		Extremely weak, partially weathered, pale grey, mottled light brown fine to medium grained SANDSTONE. Recovered as angular to tabular gravel. [PENNINE UPPER COAL MEASURES FORMATION]	1.20	54.61		
				End of Borehole at 1.20m				

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Remarks and Groundwater Observations:

1. Borehole was terminated on refusal within competent bedrock at 1.2m bgl. 2. No visual or olfactory evidence of contamination was encountered. 3. No groundwater was encountered. 4. Borehole installed with 63mm pipework as detailed above.

GL (m AOD)
55.81m AOD
Easting:
445966.43
Northing:
406230.06

Fig No.
WS07

WINDOW SAMPLING RECORD

BH No. **WS08**
Sheet 1 of 1

Site: School Street (Phase 3), Thurnscoe
Contract No: C8023
Client: Keepmoat Homes
Date: 13/09/2018
Method: Window Sampler Rig
Scale: 1:30
Logged By: RC
Checked By: GH
Driller: RP Drilling

SAMPLE DETAILS				STRATA RECORD				
Type	Depth From - To(m)	SPT (N), (ppm), Vane Result (kN/m2)	Ground-water	Description	Depth (m)	Level (m AOD)	Legend	Well
ES	0.00 - 0.30			Dark brown, slightly clayey slightly organic SAND with frequent roots, rootlets and traces. [TOPSOIL]	0.35	55.81		
D	0.60 - 0.70	N=44 (6,8/11,11,11,11)	1	Very stiff, grey mottled brown, very high strength, gravelly CLAY. Low plasticity (field description). Friable. Gravel is fine to coarse, sub-angular of siltstone. [RESIDUAL PENNINE UPPER COAL MEASURES FORMATION]				
D	1.70 - 1.90	50 (25 for 145mm/50 for 30mm)	2	End of Borehole at 2.00m	2.00	54.16		
			3					
			4					
			5					
			6					

Remarks and Groundwater Observations:

1. Borehole was terminated on refusal within natural ground at 2.0m bgl. 2. No visual or olfactory evidence of contamination was encountered. 3. No groundwater was encountered. 4. Borehole installed with 63mm pipework as detailed above.

GL (m AOD)
56.16m AOD
Easting:
445923.12
Northing:
406138.94

Fig No.
WS08

TRIAL PIT RECORD

TP No. **SA01** Sheet 1 of 1

Site: School Street (Phase 3), Thurnscoe

Contract No: C8023

Client: Keepmoat Homes

Date: 19/09/2018

Method: JCB 3CX with 2 foot toothed bucket.

Scale: 1:25

Logged By: RC | Checked By: GH

SAMPLE DETAILS				STRATA RECORD				
Type	Depth From - To(m)	Vane Results (kN/m2) (ppm)	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
				Dark brown, slightly clayey slightly organic SAND with frequent roots, rootlets and traces. [TOPSOIL]				
					0.35	48.83		
				Stiff, grey mottled light brown slightly gravelly CLAY. Low plasticity (field description). Friable. Gravel is fine to coarse, sub-angular of siltstone. [RESIDUAL PENNINE UPPER COAL MEASURES FORMATION]			
ES	1.10							
				End of trial pit at 1.60m	1.60	47.58		

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Remarks and Groundwater Observations

1. Terminated in natural ground at 1.6m bgl. 2. No groundwater encountered. 3. No visual or olfactory evidence of contamination. 4. Trial pit was stable. 5. Trial pit was backfilled with gravel and arisings on completion, to allow infiltration testing to be undertaken. 6. Refer to soakaway infiltration test reference SA01.

GL (m AOD) 49.18

Easting: 445746.62

Northing: 406174.85

Fig No. SA01

TRIAL PIT RECORD

TP No. **SA02** Sheet 1 of 1

Site: School Street (Phase 3), Thurnscoe

Contract No: C8023

Client: Keepmoat Homes

Date: 19/09/2018

Method: JCB 3CX with 2 foot toothed bucket.

Scale: 1:25

Logged By: RC | Checked By: GH

SAMPLE DETAILS				STRATA RECORD				
Type	Depth From - To(m)	Vane Results (kN/m2) (ppm)	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
				MADE GROUND: Dark brown, gravelly slightly clayey slightly organic SAND with frequent roots, rootlets and traces. Gravel is fine to coarse, sub-angular to sub-rounded of brick and pipe bedding material. [REWORKED TOPSOIL]				
				MADE GROUND: Reddish brown gravelly SAND with moderate cobble content. Gravel is fine to coarse, angular of brick and concrete, and sub-rounded of pipe bedding material. Cobbles are angular of concrete and brick. With fragments of plastic, tile, carpet and plastic pipe (land drain encountered at 1.0m bgl).	0.40	47.85		
ES	1.00		1					
				Firm, dark grey mottled reddish brown, slightly gravelly CLAY. High plasticity (field description). Gravel is fine to coarse, sub-angular of siltstone. [RESIDUAL PENNINE UPPER COAL MEASURES FORMATION]	1.10	47.15		
				End of trial pit at 1.50m	1.50	46.75		
			2					
			3					
			4					
			5					

Remarks and Groundwater Observations

1. Terminated in natural ground at 1.5m bgl. 2. No groundwater encountered. 3. No visual or olfactory evidence of contamination. 4. Trial pit was stable. 5. Trial pit was backfilled with arisings on completion.

GL (m AOD) 48.25

Easting: 445747.11

Northing: 406235.31

Fig No. SA02

TRIAL PIT RECORD

TP No. **SA02A** Sheet 1 of 1

Site: School Street (Phase 3), Thurnscoe

Contract No: C8023

Client: Keepmoat Homes

Date: 19/09/2018

Method: JCB 3CX with 2 foot toothed bucket.

Scale: 1:25

Logged By: RC | Checked By: GH

SAMPLE DETAILS				STRATA RECORD				
Type	Depth From - To(m)	Vane Results (kN/m2) (ppm)	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
				Dark brown, slightly clayey slightly organic SAND with frequent roots, rootlets and traces. [TOPSOIL]	0.40	48.79		
ES	0.70			Very stiff grey mottled yellowish brown gravelly CLAY with rootlets. Low plasticity (field description). Friable. Gravel is fine to coarse, sub-angular of siltstone and sandstone. [RESIDUAL PENNINE UPPER COAL MEASURES FORMATION]	0.70	48.49		
				Extremely weak, distinctly weathered, greyish brown SILTSTONE with thin interbeds of sandstone. Recovered as angular to tabular gravel. [PENNINE UPPER COAL MEASURES FORMATION]				
				End of trial pit at 1.10m	1.10	48.09		

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Remarks and Groundwater Observations

1. Terminated in natural ground at 1.1m bgl. 2. No groundwater encountered. 3. No visual or olfactory evidence of contamination. 4. Trial pit was stable. 5. Trial pit was backfilled with gravel and arisings on completion, to allow infiltration testing to be undertaken. 6. Refer to soakaway infiltration test reference SA02A.

GL (m AOD) 49.19

Easting: 445726.96

Northing: 406246.22

Fig No. SA02A

TRIAL PIT RECORD

TP No. **SA03** Sheet 1 of 1

Site: School Street (Phase 3), Thurnscoe

Contract No: C8023

Client: Keepmoat Homes

Date: 19/09/2018

Method: JCB 3CX with 2 foot toothed bucket.

Scale: 1:25

Logged By: RC Checked By: GH

SAMPLE DETAILS				STRATA RECORD				
Type	Depth From - To(m)	Vane Results (kN/m2) (ppm)	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
				Dark brown, slightly clayey slightly organic SAND with frequent roots, rootlets and traces. [TOPSOIL]	0.30	51.40		
ES	0.90			Stiff grey mottled light brown gravelly CLAY. Low plasticity (field description). Friable. Gravel is fine to coarse, sub-angular of siltstone. [RESIDUAL PENNINE UPPER COAL MEASURES FORMATION]	1.00	50.70		
				Stiff grey mottled dark brown gravelly CLAY. Low plasticity (field description). Friable. Gravel is fine to coarse, sub-angular of siltstone. [RESIDUAL PENNINE UPPER COAL MEASURES FORMATION]	1.10	50.60		
				End of trial pit at 1.10m				

1 2 3 4 5

Remarks and Groundwater Observations

1. Terminated in natural ground at 1.1m bgl. 2. No groundwater encountered. 3. No visual or olfactory evidence of contamination. 4. Trial pit was stable. 5. Trial pit was backfilled with gravel and arisings on completion, to allow infiltration testing to be undertaken. 6. Refer to soakaway infiltration test reference SA03.

GL (m AOD) 51.70

Easting: 445826.09

Northing: 406343.55

Fig No. SA03

TRIAL PIT RECORD

TP No. **SA04** Sheet 1 of 1

Site: School Street (Phase 3), Thurnscoe

Contract No: C8023

Client: Keepmoat Homes

Date: 19/09/2018

Method: JCB 3CX with 2 foot toothed bucket.

Scale: 1:25

Logged By: RC | Checked By: GH

SAMPLE DETAILS				STRATA RECORD				
Type	Depth From - To(m)	Vane Results (kN/m2) (ppm)	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
				Dark brown, slightly clayey slightly organic SAND with frequent roots, rootlets and traces. [TOPSOIL]	0.30	54.61		
				Stiff, greyish brown CLAY with root traces. Low plasticity (field description). Friable. [RESIDUAL PENNINE UPPER COAL MEASURES FORMATION]	0.75	54.16		
ES	0.80			Extremely weak, partially weathered, greyish brown fine to medium grained SANDSTONE. Recovered as angular to tabular gravel. [PENNINE UPPER COAL MEASURES FORMATION]				
				End of trial pit at 1.40m	1.40	53.51		

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2
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4
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Remarks and Groundwater Observations

1. Terminated in natural ground at 1.4m bgl. 2. No groundwater encountered. 3. No visual or olfactory evidence of contamination. 4. Trial pit was stable. 5. Trial pit was backfilled with gravel and arisings on completion, to allow infiltration testing to be undertaken. 6. Refer to soakaway infiltration test reference SA04.

GL (m AOD) 54.91

Easting: 445967.49

Northing: 406279.44

Fig No. SA04

SOAKAWAY DESIGN IN ACCORDANCE WITH BRE DIGEST 365: 2007			
Client:	Keepmoat Homes		
Site:	Phase 3 (School Street), Thurnscoe		
Job No:	C8023	Test No:	SA01

CALCULATION OF SOIL INFILTRATION RATE

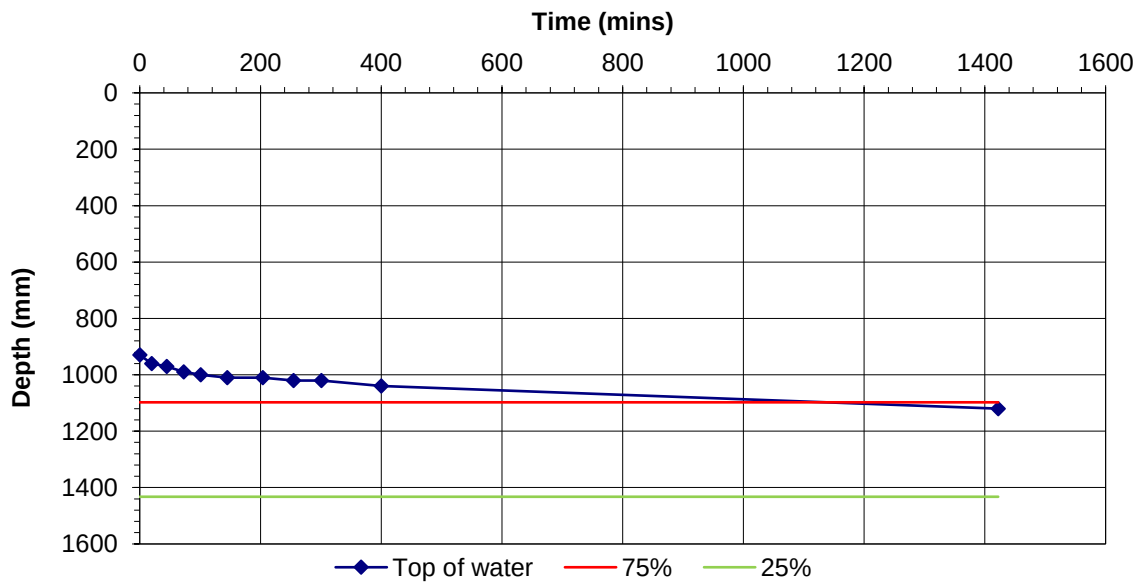
Time (min)	Depth (mm)
0	930
20	960
45	970
73	990
101	1000
145	1010
204	1010
255	1020
301	1020
400	1040
1422	1120

Size of Soakaway		
	Length (m) =	2.00
	Width (m) =	0.65
	Depth (m) =	1.60

Depth at start of test (mm)=	930mm
Depth of trial pit (mm)=	1600mm
75% effective depth (mm)=	1098mm
50% effective depth =	1265mm
25% effective depth =	1433mm
Base area of pit (m^2) =	1.300
Effective area of loss 50% (m^2) =	3.076
Volume outflow 75 - 25% (m^3) =	0.436

From the graph:	
tp 75 (min) =	1200
tp 25 (min) =	NA

Soil infiltration rate, f, (m/s) =		NA	Normal test
Input by:	RC	Date:	26/09/2018
Checked by:	GH	Date:	01/10/2018



SOAKAWAY DESIGN IN ACCORDANCE WITH BRE DIGEST 365: 2007			
Client:	Keepmoat Homes		
Site:	Phase 3 (School Street), Thurnscoe		
Job No:	C8023	Test No:	SA02A

CALCULATION OF SOIL INFILTRATION RATE

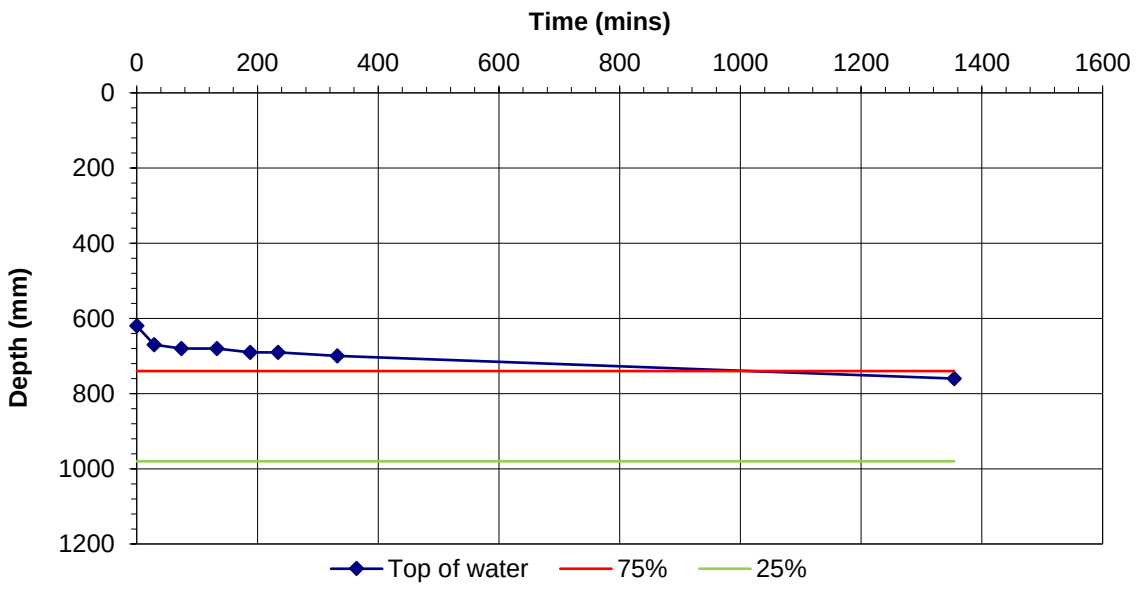
Time (min)	Depth (mm)
0	620
29	670
74	680
133	680
188	690
234	690
332	700
1354	760

Size of Soakaway		
	Length (m) =	1.80
	Width (m) =	0.65
	Depth (m) =	1.10

Depth at start of test (mm)=	620mm
Depth of trial pit (mm)=	1100mm
75% effective depth (mm)=	740mm
50% effective depth =	860mm
25% effective depth =	980mm
Base area of pit (m^2) =	1.170
Effective area of loss 50% (m^2) =	2.346
Volume outflow 75 - 25% (m^3) =	0.281

From the graph:	
tp 75 (min) =	1000
tp 25 (min) =	NA

Soil infiltration rate, f, (m/s) =		NA	Normal test
Input by:	RC	Date:	26/09/2019
Checked by:	GH	Date:	01/10/2018



SOAKAWAY DESIGN IN ACCORDANCE WITH BRE DIGEST 365: 2007			
Client:	Keepmoat Homes		
Site:	Phase 3 (School Street), Thurnscoe		
Job No:	C8023	Test No:	SA03

CALCULATION OF SOIL INFILTRATION RATE

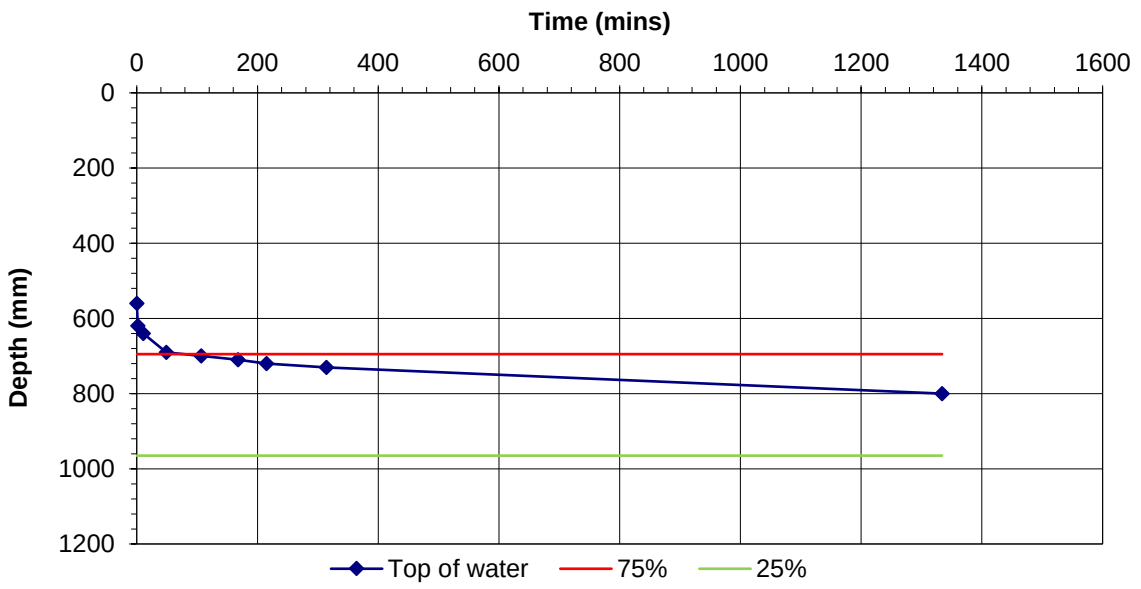
Time (min)	Depth (mm)
0	560
2	620
11	640
49	690
107	700
168	710
215	720
314	730
1334	800

Size of Soakaway		
	Length (m) =	1.80
	Width (m) =	0.65
	Depth (m) =	1.10

Depth at start of test (mm)=	560mm
Depth of trial pit (mm)=	1100mm
75% effective depth (mm)=	695mm
50% effective depth =	830mm
25% effective depth =	965mm
Base area of pit (m^2) =	1.170
Effective area of loss 50% (m^2) =	2.493
Volume outflow 75 - 25% (m^3) =	0.316

From the graph:	
tp 75 (min) =	50
tp 25 (min) =	NA

Soil infiltration rate, f, (m/s) =	NA	Normal test
Input by:	RC	Date: 26/09/2019
Checked by:	GH	Date: 01/10/2018



SOAKAWAY DESIGN IN ACCORDANCE WITH BRE DIGEST 365: 2007			
Client:	Keepmoat Homes		
Site:	Phase 3 (School Street), Thurnscoe		
Job No:	C8023	Test No:	SA04

CALCULATION OF SOIL INFILTRATION RATE

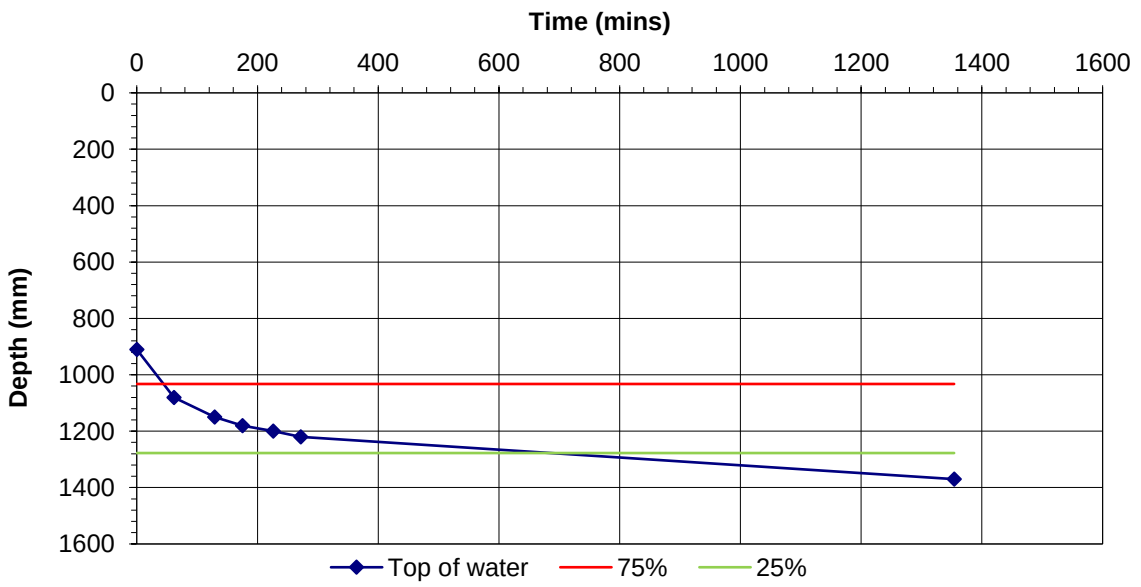
Time (min)	Depth (mm)
0	910
62	1080
129	1150
175	1180
226	1200
272	1220
1354	1370

Size of Soakaway		
	Length (m) =	2.10
	Width (m) =	0.65
	Depth (m) =	1.40

Depth at start of test (mm)=	910mm
Depth of trial pit (mm)=	1400mm
75% effective depth (mm)=	1033mm
50% effective depth =	1155mm
25% effective depth =	1278mm
Base area of pit (m^2) =	1.365
Effective area of loss 50% (m^2) =	2.713
Volume outflow 75 - 25% (m^3) =	0.334

From the graph:	
tp 75 (min) =	45
tp 25 (min) =	695

Soil infiltration rate, f, (m/s) =		3.16E-06	Normal test
Input by:	RC	Date:	26/09/2019
Checked by:	GH	Date:	01/10/2018



APPENDIX F

LABORATORY TEST RESULTS

Chemtest Ltd.
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	18-27717-1
Initial Date of Issue:	25-Sep-2018
Client	Sirius Geotechnical Ltd
Client Address:	4245 Park Approach Thorpe Park Leeds West Yorkshire LS15 8GB
Contact(s):	Gemma Halliday Richard Caine
Project	C8023 - School Street, Phase 3, Thurnscoe

Quotation No.:		**Date Received:**	12-Sep-2018
Order No.:	C8023/17503/GH	**Date Instructed:**	14-Sep-2018
No. of Samples:	5		
Turnaround (Wkdays):	8	**Results Due:**	25-Sep-2018
Date Approved:	25-Sep-2018		

Approved By:

Details: Glynn Harvey, Laboratory Manager

Chemtest
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Results - Soil

Project: C8023 - School Street, Phase 3, Thurnscoe

Client: Sirius Geotechnical Ltd			**Chemtest Job No.:**		18-27717	18-27717	18-27717	18-27717	18-27717
Quotation No.:			**Chemtest Sample ID.:**		687454	687456	687458	687459	687460
			Client Sample ID.:		TP01	TP03	TP05	TP06	TP07
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		0.30	0.20	0.20	0.10	0.20
			Date Sampled:		10-Sep-2018	10-Sep-2018	10-Sep-2018	10-Sep-2018	10-Sep-2018
			Asbestos Lab:		DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**					
ACM Type	U	2192		N/A	-		-	-	-
Asbestos Identification	U	2192	%	0.001	No Asbestos Detected		No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Moisture	N	2030	%	0.020	12	8.8	14	12	17
Soil Colour	N	2040		N/A	Brown,	Brown,	Brown,	Brown,	Brown
Other Material	N	2040		N/A	Stones,	Stones,	Stones,	Stones,	Stones
Soil Texture	N	2040		N/A	Sand,	Sand,	Sand,	Sand,	Sand
pH	M	2010		N/A	7.9	7.5	7.7	7.5	7.8
Sulphate (2:1 Water Soluble) as SO4	M	2120	g/l	0.010	0.024	0.012	< 0.010	0.014	< 0.010
Sulphate (Total)	M	2430	%	0.010	0.12	0.036	0.083	0.093	0.078
Arsenic	M	2450	mg/kg	1.0	15	9.5	19	17	21
Cadmium	M	2450	mg/kg	0.10	0.70	0.29	0.30	0.29	0.36
Chromium	M	2450	mg/kg	1.0	24	38	27	33	25
Copper	M	2450	mg/kg	0.50	29	27	22	27	23
Mercury	M	2450	mg/kg	0.10	0.13	< 0.10	0.10	0.11	< 0.10
Nickel	M	2450	mg/kg	0.50	24	43	21	23	19
Lead	M	2450	mg/kg	0.50	58	33	36	47	42
Selenium	M	2450	mg/kg	0.20	0.62	0.47	0.83	0.51	0.55
Zinc	M	2450	mg/kg	0.50	140	120	91	110	93
Total Organic Carbon	M	2625	%	0.20	3.1	0.78	1.8	1.9	2.2
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0				< 1.0	
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0				< 1.0	
Aliphatic TPH >C8-C10	M	2680	mg/kg	1.0				< 1.0	
Aliphatic TPH >C10-C12	M	2680	mg/kg	1.0				< 1.0	
Aliphatic TPH >C12-C16	M	2680	mg/kg	1.0				< 1.0	
Aliphatic TPH >C16-C21	M	2680	mg/kg	1.0				< 1.0	
Aliphatic TPH >C21-C35	M	2680	mg/kg	1.0				< 1.0	
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0				< 1.0	
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0				< 5.0	
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0				< 1.0	
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0				< 1.0	
Aromatic TPH >C8-C10	M	2680	mg/kg	1.0				< 1.0	
Aromatic TPH >C10-C12	M	2680	mg/kg	1.0				< 1.0	
Aromatic TPH >C12-C16	M	2680	mg/kg	1.0				< 1.0	
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0				< 1.0	
Aromatic TPH >C21-C35	M	2680	mg/kg	1.0				< 1.0	
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0				< 1.0	
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0				< 5.0	
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0				< 10	

Chemtest
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Results - Soil

Project: C8023 - School Street, Phase 3, Thurnscoe

Client: Sirius Geotechnical Ltd			**Chemtest Job No.:**		18-27717	18-27717	18-27717	18-27717	18-27717
Quotation No.:			**Chemtest Sample ID.:**		687454	687456	687458	687459	687460
			Client Sample ID.:		TP01	TP03	TP05	TP06	TP07
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		0.30	0.20	0.20	0.10	0.20
			Date Sampled:		10-Sep-2018	10-Sep-2018	10-Sep-2018	10-Sep-2018	10-Sep-2018
			Asbestos Lab:		DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**					
Naphthalene	M	2700	mg/kg	0.10	0.52	< 0.10	< 0.10	0.21	< 0.10
Acenaphthylene	M	2700	mg/kg	0.10	0.24	< 0.10	< 0.10	0.14	< 0.10
Acenaphthene	M	2700	mg/kg	0.10	0.21	< 0.10	< 0.10	0.10	< 0.10
Fluorene	M	2700	mg/kg	0.10	0.37	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	M	2700	mg/kg	0.10	1.5	0.26	< 0.10	0.29	< 0.10
Anthracene	M	2700	mg/kg	0.10	0.36	< 0.10	< 0.10	0.15	< 0.10
Fluoranthene	M	2700	mg/kg	0.10	2.3	0.40	< 0.10	0.45	0.11
Pyrene	M	2700	mg/kg	0.10	2.5	0.31	< 0.10	0.48	0.12
Benzo[a]anthracene	M	2700	mg/kg	0.10	1.3	0.12	< 0.10	0.16	< 0.10
Chrysene	M	2700	mg/kg	0.10	2.3	0.54	< 0.10	0.65	< 0.10
Benzo[b]fluoranthene	M	2700	mg/kg	0.10	1.3	< 0.10	< 0.10	0.23	< 0.10
Benzo[k]fluoranthene	M	2700	mg/kg	0.10	0.70	< 0.10	< 0.10	0.27	< 0.10
Benzo[a]pyrene	M	2700	mg/kg	0.10	1.3	< 0.10	< 0.10	0.35	< 0.10
Indeno(1,2,3-c,d)Pyrene	M	2700	mg/kg	0.10	1.6	< 0.10	< 0.10	0.11	< 0.10
Dibenz(a,h)Anthracene	M	2700	mg/kg	0.10	1.4	< 0.10	< 0.10	0.13	< 0.10
Benzo[g,h,i]perylene	M	2700	mg/kg	0.10	2.3	< 0.10	< 0.10	0.25	< 0.10
Total Of 16 PAH's	M	2700	mg/kg	2.0	20	< 2.0	< 2.0	4.0	< 2.0
Benzene	M	2760	µg/kg	1.0				< 1.0	
Toluene	M	2760	µg/kg	1.0				< 1.0	
Ethylbenzene	M	2760	µg/kg	1.0				< 1.0	
m & p-Xylene	M	2760	µg/kg	1.0				< 1.0	
o-Xylene	M	2760	µg/kg	1.0				< 1.0	
Methyl Tert-Butyl Ether	M	2760	µg/kg	1.0				< 1.0	
Total Phenols	M	2920	mg/kg	0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30

Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2430	Total Sulphate in soils	Total Sulphate	Acid digestion followed by determination of sulphate in extract by ICP-OES.
2450	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.

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Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis
The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols
For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Chemtest
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Chemtest Ltd.
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	18-27846-1
Initial Date of Issue:	21-Sep-2018
Client	Sirius Geotechnical Ltd
Client Address:	4245 Park Approach Thorpe Park Leeds West Yorkshire LS15 8GB
Contact(s):	Richard Caine Gemma Halliday
Project	C8023 - School Street, Phase 3, Thurnscoe

Quotation No.:		**Date Received:**	13-Sep-2018
Order No.:	C8023/17503/GH	**Date Instructed:**	14-Sep-2018
No. of Samples:	3		
Turnaround (Wkdays):	5	**Results Due:**	20-Sep-2018
Date Approved:	21-Sep-2018		

Approved By:

Details: Martin Dyer, Laboratory Manager

Chemtest
The right chemistry to deliver results

Results - Soil

Project: C8023 - School Street, Phase 3, Thurnscoe

Client: Sirius Geotechnical Ltd			**Chemtest Job No.:**		18-27846	18-27846	18-27846
Quotation No.:			**Chemtest Sample ID.:**		688003	688004	688007
			Sample Location:		TP09	TP18	TP21
			Sample Type:		SOIL	SOIL	SOIL
			Top Depth (m):		0.1	0.1	0.2
			Date Sampled:		11-Sep-2018	11-Sep-2018	12-Sep-2018
			Asbestos Lab:		COVENTRY	COVENTRY	
Determinand	**Accred.**	**SOP**	**Units**	**LOD**			
ACM Type	U	2192		N/A	-	-	
Asbestos Identification	U	2192	%	0.001	No Asbestos Detected	No Asbestos Detected	
Moisture	N	2030	%	0.020	11	11	9.2
Soil Colour	N	2040		N/A	Brown	Brown	Brown
Other Material	N	2040		N/A	Stones	Stones	Stones
Soil Texture	N	2040		N/A	Sand	Sand	Sand
pH	M	2010		N/A	7.4	7.3	7.3
Sulphate (2:1 Water Soluble) as SO4	M	2120	g/l	0.010	0.022	0.019	< 0.010
Sulphate (Total)	M	2430	%	0.010	0.072	0.084	0.075
Arsenic	M	2450	mg/kg	1.0	13	16	15
Cadmium	M	2450	mg/kg	0.10	0.28	0.28	0.36
Chromium	M	2450	mg/kg	1.0	31	22	24
Copper	M	2450	mg/kg	0.50	26	22	24
Mercury	M	2450	mg/kg	0.10	< 0.10	< 0.10	0.10
Nickel	M	2450	mg/kg	0.50	27	17	24
Lead	M	2450	mg/kg	0.50	50	50	44
Selenium	M	2450	mg/kg	0.20	0.43	0.62	0.61
Zinc	M	2450	mg/kg	0.50	110	75	90
Total Organic Carbon	M	2625	%	0.20	1.7	1.9	1.6
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0		< 1.0	
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0		< 1.0	
Aliphatic TPH >C8-C10	M	2680	mg/kg	1.0		< 1.0	
Aliphatic TPH >C10-C12	M	2680	mg/kg	1.0		< 1.0	
Aliphatic TPH >C12-C16	M	2680	mg/kg	1.0		< 1.0	
Aliphatic TPH >C16-C21	M	2680	mg/kg	1.0		< 1.0	
Aliphatic TPH >C21-C35	M	2680	mg/kg	1.0		< 1.0	
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0		< 1.0	
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0		< 5.0	
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0		< 1.0	
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0		< 1.0	
Aromatic TPH >C8-C10	M	2680	mg/kg	1.0		< 1.0	
Aromatic TPH >C10-C12	M	2680	mg/kg	1.0		< 1.0	
Aromatic TPH >C12-C16	M	2680	mg/kg	1.0		< 1.0	
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0		< 1.0	
Aromatic TPH >C21-C35	M	2680	mg/kg	1.0		< 1.0	
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0		< 1.0	
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0		< 5.0	
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0		< 10	

Chemtest
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Results - Soil

Project: C8023 - School Street, Phase 3, Thurnscoe

Client: Sirius Geotechnical Ltd			**Chemtest Job No.:**		18-27846	18-27846	18-27846
Quotation No.:			**Chemtest Sample ID.:**		688003	688004	688007
			Sample Location:		TP09	TP18	TP21
			Sample Type:		SOIL	SOIL	SOIL
			Top Depth (m):		0.1	0.1	0.2
			Date Sampled:		11-Sep-2018	11-Sep-2018	12-Sep-2018
			Asbestos Lab:		COVENTRY	COVENTRY	
Determinand	**Accred.**	**SOP**	**Units**	**LOD**			
Naphthalene	M	2700	mg/kg	0.10	0.24	0.15	0.13
Acenaphthylene	M	2700	mg/kg	0.10	0.18	0.18	0.11
Acenaphthene	M	2700	mg/kg	0.10	0.14	0.10	0.10
Fluorene	M	2700	mg/kg	0.10	0.10	0.13	< 0.10
Phenanthrene	M	2700	mg/kg	0.10	0.46	0.35	0.35
Anthracene	M	2700	mg/kg	0.10	0.32	0.17	0.16
Fluoranthene	M	2700	mg/kg	0.10	0.52	0.51	0.56
Pyrene	M	2700	mg/kg	0.10	0.55	0.34	0.21
Benzo[a]anthracene	M	2700	mg/kg	0.10	0.22	0.11	0.14
Chrysene	M	2700	mg/kg	0.10	0.75	0.48	0.32
Benzo[b]fluoranthene	M	2700	mg/kg	0.10	0.33	0.21	< 0.10
Benzo[k]fluoranthene	M	2700	mg/kg	0.10	0.56	0.16	< 0.10
Benzo[a]pyrene	M	2700	mg/kg	0.10	0.29	0.39	< 0.10
Indeno(1,2,3-c,d)Pyrene	M	2700	mg/kg	0.10	0.13	< 0.10	< 0.10
Dibenz(a,h)Anthracene	M	2700	mg/kg	0.10	0.31	< 0.10	< 0.10
Benzo[g,h,i]perylene	M	2700	mg/kg	0.10	0.22	0.33	< 0.10
Total Of 16 PAH's	M	2700	mg/kg	2.0	5.3	3.6	2.1
Benzene	M	2760	µg/kg	1.0		< 1.0	
Toluene	M	2760	µg/kg	1.0		< 1.0	
Ethylbenzene	M	2760	µg/kg	1.0		< 1.0	
m & p-Xylene	M	2760	µg/kg	1.0		< 1.0	
o-Xylene	M	2760	µg/kg	1.0		< 1.0	
Methyl Tert-Butyl Ether	M	2760	µg/kg	1.0		< 1.0	
Demeton-O	N	2820	mg/kg	0.20	< 0.20		
Phorate	N	2820	mg/kg	0.20	< 0.20		
Demeton-S	N	2820	mg/kg	0.20	< 0.20		
Disulfoton	N	2820	mg/kg	0.20	< 0.20		
Fenthion	N	2820	mg/kg	0.20	< 0.20		
Trichloronate	N	2820	mg/kg	0.20	< 0.20		
Prothiofos	N	2820	mg/kg	0.20	< 0.20		
Fensulphothion	N	2820	mg/kg	0.20	< 0.20		
Sulprofos	N	2820	mg/kg	0.20	< 0.20		
Azinphos-Methyl	N	2820	mg/kg	0.20	< 0.20		
Coumaphos	N	2820	mg/kg	0.20	< 0.20		
Alpha-HCH	N	2840	mg/kg	0.20	< 0.20		
Gamma-HCH (Lindane)	N	2840	mg/kg	0.20	< 0.20		
Beta-HCH	N	2840	mg/kg	0.20	< 0.20		
Delta-HCH	N	2840	mg/kg	0.20	< 0.20		
Heptachlor	N	2840	mg/kg	0.20	< 0.20		

Chemtest
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Results - Soil

Project: C8023 - School Street, Phase 3, Thurnscoe

Client: Sirius Geotechnical Ltd			**Chemtest Job No.:**		18-27846	18-27846	18-27846
Quotation No.:			**Chemtest Sample ID.:**		688003	688004	688007
			Sample Location:		TP09	TP18	TP21
			Sample Type:		SOIL	SOIL	SOIL
			Top Depth (m):		0.1	0.1	0.2
			Date Sampled:		11-Sep-2018	11-Sep-2018	12-Sep-2018
			Asbestos Lab:		COVENTRY	COVENTRY	
Determinand	**Accred.**	**SOP**	**Units**	**LOD**			
Aldrin	N	2840	mg/kg	0.20	< 0.20		
Heptachlor Epoxide	N	2840	mg/kg	0.20	< 0.20		
Gamma-Chlordane	N	2840	mg/kg	0.20	< 0.20		
Alpha-Chlordane	N	2840	mg/kg	0.20	< 0.20		
Endosulfan I	N	2840	mg/kg	0.20	< 0.20		
4,4-DDE	N	2840	mg/kg	0.20	< 0.20		
Dieldrin	N	2840	mg/kg	0.20	< 0.20		
Endrin	N	2840	mg/kg	0.20	< 0.20		
4,4-DDD	N	2840	mg/kg	0.20	< 0.20		
Endosulfan II	N	2840	mg/kg	0.20	< 0.20		
Endrin Aldehyde	N	2840	mg/kg	0.20	< 0.20		
4,4-DDT	N	2840	mg/kg	0.20	< 0.20		
Endosulfan Sulphate	N	2840	mg/kg	0.20	< 0.20		
Methoxychlor	N	2840	mg/kg	0.20	< 0.20		
Endrin Ketone	N	2840	mg/kg	0.20	< 0.20		
Total Phenols	M	2920	mg/kg	0.30	< 0.30	< 0.30	< 0.30

Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2430	Total Sulphate in soils	Total Sulphate	Acid digestion followed by determination of sulphate in extract by ICP-OES.
2450	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2820	Organophosphorus (O-P) Pesticides in Soils by GC-MS	Organophosphorus pesticide representative suite including Parathion, Malathion etc, plus client specific determinands	Dichloromethane extraction / GC-MS
2840	Organochlorine (O-Cl) Pesticides in Soils by GC-MS	Organochlorine pesticide representative suite including DDT and its metabolites, ‘drins’ and HCH etc, plus client specific determinands	Dichloromethane extraction / GC-MS
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis
The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols
For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Chemtest
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Chemtest Ltd.
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	18-27848-1
Initial Date of Issue:	20-Sep-2018
Client	Sirius Geotechnical Ltd
Client Address:	4245 Park Approach Thorpe Park Leeds West Yorkshire LS15 8GB
Contact(s):	Richard Caine Gemma Halliday
Project	C8023 - School Street, Phase 3, Thurnscoe

Quotation No.:		**Date Received:**	13-Sep-2018
Order No.:	C8023/17503/GH	**Date Instructed:**	14-Sep-2018
No. of Samples:	3		
Turnaround (Wkdays):	5	**Results Due:**	20-Sep-2018
Date Approved:	20-Sep-2018		

Approved By:

Details: Robert Monk, Technical Manager

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Results - Soil

Project: C8023 - School Street, Phase 3, Thurnscoe

Client: Sirius Geotechnical Ltd		**Chemtest Job No.:**			18-27848	18-27848	18-27848
Quotation No.:		**Chemtest Sample ID.:**			688030	688033	688035
			Sample Location:		TP10	TP13	TP15
			Sample Type:		SOIL	SOIL	SOIL
			Top Depth (m):		0.3	0.1	0.1
			Date Sampled:		11-Sep-2018	11-Sep-2018	11-Sep-2018
			Asbestos Lab:			COVENTRY	COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**			
ACM Type	U	2192		N/A		-	-
Asbestos Identification	U	2192	%	0.001		No Asbestos Detected	No Asbestos Detected
Moisture	N	2030	%	0.020	8.0	11	9.6
Soil Colour	N	2040		N/A	Brown	Brown	Brown
Other Material	N	2040		N/A	Stones	Stones	Stones,
Soil Texture	N	2040		N/A	Sand	Sand	Sand,
pH	M	2010		N/A	7.4	7.4	6.6
Sulphate (2:1 Water Soluble) as SO4	M	2120	g/l	0.010	< 0.010	0.049	0.046
Sulphate (Total)	M	2430	%	0.010	0.045	0.082	0.084
Arsenic	M	2450	mg/kg	1.0	10	15	15
Cadmium	M	2450	mg/kg	0.10	0.11	0.22	0.27
Chromium	M	2450	mg/kg	1.0	33	23	24
Copper	M	2450	mg/kg	0.50	27	24	21
Mercury	M	2450	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Nickel	M	2450	mg/kg	0.50	35	19	22
Lead	M	2450	mg/kg	0.50	29	39	39
Selenium	M	2450	mg/kg	0.20	0.27	0.49	0.61
Zinc	M	2450	mg/kg	0.50	89	75	79
Total Organic Carbon	M	2625	%	0.20	0.81	1.6	1.6
Naphthalene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Acenaphthylene	M	2700	mg/kg	0.10	0.32	< 0.10	< 0.10
Acenaphthene	M	2700	mg/kg	0.10	0.13	< 0.10	< 0.10
Fluorene	M	2700	mg/kg	0.10	0.12	< 0.10	< 0.10
Phenanthrene	M	2700	mg/kg	0.10	0.30	0.52	< 0.10
Anthracene	M	2700	mg/kg	0.10	0.16	0.12	< 0.10
Fluoranthene	M	2700	mg/kg	0.10	0.30	0.46	0.24
Pyrene	M	2700	mg/kg	0.10	0.36	0.70	0.26
Benzo[a]anthracene	M	2700	mg/kg	0.10	0.14	< 0.10	< 0.10
Chrysene	M	2700	mg/kg	0.10	0.48	< 0.10	< 0.10
Benzo[b]fluoranthene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Benzo[a]pyrene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Total Of 16 PAH's	M	2700	mg/kg	2.0	2.3	< 2.0	< 2.0
Demeton-O	N	2820	mg/kg	0.20			< 0.20
Phorate	N	2820	mg/kg	0.20			< 0.20

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Results - Soil

Project: C8023 - School Street, Phase 3, Thurnscoe

Client: Sirius Geotechnical Ltd			**Chemtest Job No.:**		18-27848	18-27848	18-27848
Quotation No.:			**Chemtest Sample ID.:**		688030	688033	688035
			Sample Location:		TP10	TP13	TP15
			Sample Type:		SOIL	SOIL	SOIL
			Top Depth (m):		0.3	0.1	0.1
			Date Sampled:		11-Sep-2018	11-Sep-2018	11-Sep-2018
			Asbestos Lab:			COVENTRY	COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**			
Demeton-S	N	2820	mg/kg	0.20			< 0.20
Disulfoton	N	2820	mg/kg	0.20			< 0.20
Fenthion	N	2820	mg/kg	0.20			< 0.20
Trichloronate	N	2820	mg/kg	0.20			< 0.20
Prothiofos	N	2820	mg/kg	0.20			< 0.20
Fensulphothion	N	2820	mg/kg	0.20			< 0.20
Sulprofos	N	2820	mg/kg	0.20			< 0.20
Azinphos-Methyl	N	2820	mg/kg	0.20			< 0.20
Coumaphos	N	2820	mg/kg	0.20			< 0.20
Alpha-HCH	N	2840	mg/kg	0.20			< 0.20
Gamma-HCH (Lindane)	N	2840	mg/kg	0.20			< 0.20
Beta-HCH	N	2840	mg/kg	0.20			< 0.20
Delta-HCH	N	2840	mg/kg	0.20			< 0.20
Heptachlor	N	2840	mg/kg	0.20			< 0.20
Aldrin	N	2840	mg/kg	0.20			< 0.20
Heptachlor Epoxide	N	2840	mg/kg	0.20			< 0.20
Gamma-Chlordane	N	2840	mg/kg	0.20			< 0.20
Alpha-Chlordane	N	2840	mg/kg	0.20			< 0.20
Endosulfan I	N	2840	mg/kg	0.20			< 0.20
4,4-DDE	N	2840	mg/kg	0.20			< 0.20
Dieldrin	N	2840	mg/kg	0.20			< 0.20
Endrin	N	2840	mg/kg	0.20			< 0.20
4,4-DDD	N	2840	mg/kg	0.20			< 0.20
Endosulfan II	N	2840	mg/kg	0.20			< 0.20
Endrin Aldehyde	N	2840	mg/kg	0.20			< 0.20
4,4-DDT	N	2840	mg/kg	0.20			< 0.20
Endosulfan Sulphate	N	2840	mg/kg	0.20			< 0.20
Methoxychlor	N	2840	mg/kg	0.20			< 0.20
Endrin Ketone	N	2840	mg/kg	0.20			< 0.20
Total Phenols	M	2920	mg/kg	0.30	< 0.30	< 0.30	< 0.30

Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2430	Total Sulphate in soils	Total Sulphate	Acid digestion followed by determination of sulphate in extract by ICP-OES.
2450	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID
2820	Organophosphorus (O-P) Pesticides in Soils by GC-MS	Organophosphorus pesticide representative suite including Parathion, Malathion etc, plus client specific determinands	Dichloromethane extraction / GC-MS
2840	Organochlorine (O-Cl) Pesticides in Soils by GC-MS	Organochlorine pesticide representative suite including DDT and its metabolites, ‘drins’ and HCH etc, plus client specific determinands	Dichloromethane extraction / GC-MS
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.

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Report Information

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I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis
The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols
For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Chemtest
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Chemtest Ltd.
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	18-27849-1
Initial Date of Issue:	21-Sep-2018
Client	Sirius Geotechnical Ltd
Client Address:	4245 Park Approach Thorpe Park Leeds West Yorkshire LS15 8GB
Contact(s):	Richard Caine Gemma Halliday
Project	C8023 - School Street, Phase 3, Thurnscoe

Quotation No.:		**Date Received:**	13-Sep-2018
Order No.:	C8023/17503/GH	**Date Instructed:**	14-Sep-2018
No. of Samples:	3		
Turnaround (Wkdays):	5	**Results Due:**	20-Sep-2018
Date Approved:	21-Sep-2018		

Approved By:

Details: Martin Dyer, Laboratory Manager

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Results - Soil

Project: C8023 - School Street, Phase 3, Thurnscoe

Client: Sirius Geotechnical Ltd			**Chemtest Job No.:**		18-27849	18-27849	18-27849
Quotation No.:			**Chemtest Sample ID.:**		688038	688042	688044
			Sample Location:		TP23	TP27	TP29
			Sample Type:		SOIL	SOIL	SOIL
			Top Depth (m):		0.3	0.1	0.1
			Date Sampled:		12-Sep-2018	12-Sep-2018	12-Sep-2018
			Asbestos Lab:			COVENTRY	COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**			
ACM Type	U	2192		N/A		-	-
Asbestos Identification	U	2192	%	0.001		No Asbestos Detected	No Asbestos Detected
Moisture	N	2030	%	0.020	15	13	11
Soil Colour	N	2040		N/A	Brown	Brown	Brown
Other Material	N	2040		N/A	Stones	Stones	Stones
Soil Texture	N	2040		N/A	Sand	Sand,	Sand,
pH	M	2010		N/A	7.3	7.4	7.5
Sulphate (2:1 Water Soluble) as SO4	M	2120	g/l	0.010	0.028	0.035	0.016
Sulphate (Total)	M	2430	%	0.010	0.089	0.092	0.071
Arsenic	M	2450	mg/kg	1.0	18	14	15
Cadmium	M	2450	mg/kg	0.10	0.24	0.29	0.23
Chromium	M	2450	mg/kg	1.0	26	32	23
Copper	M	2450	mg/kg	0.50	29	24	23
Mercury	M	2450	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Nickel	M	2450	mg/kg	0.50	24	24	18
Lead	M	2450	mg/kg	0.50	49	47	45
Selenium	M	2450	mg/kg	0.20	0.62	0.50	0.64
Zinc	M	2450	mg/kg	0.50	86	91	71
Total Organic Carbon	M	2625	%	0.20	1.9	1.7	1.7
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0		< 1.0	
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0		< 1.0	
Aliphatic TPH >C8-C10	M	2680	mg/kg	1.0		< 1.0	
Aliphatic TPH >C10-C12	M	2680	mg/kg	1.0		< 1.0	
Aliphatic TPH >C12-C16	M	2680	mg/kg	1.0		< 1.0	
Aliphatic TPH >C16-C21	M	2680	mg/kg	1.0		< 1.0	
Aliphatic TPH >C21-C35	M	2680	mg/kg	1.0		< 1.0	
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0		< 1.0	
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0		< 5.0	
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0		< 1.0	
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0		< 1.0	
Aromatic TPH >C8-C10	M	2680	mg/kg	1.0		< 1.0	
Aromatic TPH >C10-C12	M	2680	mg/kg	1.0		< 1.0	
Aromatic TPH >C12-C16	M	2680	mg/kg	1.0		< 1.0	
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0		< 1.0	
Aromatic TPH >C21-C35	M	2680	mg/kg	1.0		< 1.0	
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0		< 1.0	
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0		< 5.0	
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0		< 10	

Chemtest
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Results - Soil

Project: C8023 - School Street, Phase 3, Thurnscoe

Client: Sirius Geotechnical Ltd			**Chemtest Job No.:**		18-27849	18-27849	18-27849
Quotation No.:			**Chemtest Sample ID.:**		688038	688042	688044
			Sample Location:		TP23	TP27	TP29
			Sample Type:		SOIL	SOIL	SOIL
			Top Depth (m):		0.3	0.1	0.1
			Date Sampled:		12-Sep-2018	12-Sep-2018	12-Sep-2018
			Asbestos Lab:			COVENTRY	COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**			
Naphthalene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Acenaphthylene	M	2700	mg/kg	0.10	< 0.10	0.14	< 0.10
Acenaphthene	M	2700	mg/kg	0.10	< 0.10	0.23	< 0.10
Fluorene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	M	2700	mg/kg	0.10	0.22	0.55	< 0.10
Anthracene	M	2700	mg/kg	0.10	< 0.10	0.14	< 0.10
Fluoranthene	M	2700	mg/kg	0.10	0.37	0.74	0.28
Pyrene	M	2700	mg/kg	0.10	0.33	0.73	0.26
Benzo[a]anthracene	M	2700	mg/kg	0.10	< 0.10	0.27	< 0.10
Chrysene	M	2700	mg/kg	0.10	< 0.10	0.51	< 0.10
Benzo[b]fluoranthene	M	2700	mg/kg	0.10	< 0.10	0.46	< 0.10
Benzo[k]fluoranthene	M	2700	mg/kg	0.10	< 0.10	0.57	< 0.10
Benzo[a]pyrene	M	2700	mg/kg	0.10	< 0.10	1.4	< 0.10
Indeno(1,2,3-c,d)Pyrene	M	2700	mg/kg	0.10	< 0.10	0.20	< 0.10
Dibenz(a,h)Anthracene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	M	2700	mg/kg	0.10	< 0.10	0.44	< 0.10
Total Of 16 PAH's	M	2700	mg/kg	2.0	< 2.0	6.4	< 2.0
Benzene	M	2760	µg/kg	1.0		< 1.0	
Toluene	M	2760	µg/kg	1.0		< 1.0	
Ethylbenzene	M	2760	µg/kg	1.0		< 1.0	
m & p-Xylene	M	2760	µg/kg	1.0		< 1.0	
o-Xylene	M	2760	µg/kg	1.0		< 1.0	
Methyl Tert-Butyl Ether	M	2760	µg/kg	1.0		< 1.0	
Total Phenols	M	2920	mg/kg	0.30	< 0.30	< 0.30	< 0.30

Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2430	Total Sulphate in soils	Total Sulphate	Acid digestion followed by determination of sulphate in extract by ICP-OES.
2450	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.

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Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis
The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols
For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

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Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	18-29075-1
Initial Date of Issue:	26-Sep-2018
Client	Sirius Geotechnical Ltd
Client Address:	4245 Park Approach Thorpe Park Leeds West Yorkshire LS15 8GB
Contact(s):	Gemma Halliday Richard Caine
Project	C8023 School Street, Phase3, Thurnscoe

Quotation No.:		**Date Received:**	24-Sep-2018
Order No.:	C8023/17517/GH	**Date Instructed:**	24-Sep-2018
No. of Samples:	3		
Turnaround (Wkdays):	5	**Results Due:**	28-Sep-2018
Date Approved:	26-Sep-2018		

Approved By:

Details: Robert Monk, Technical Manager

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Results - Soil

Project: C8023 School Street, Phase3, Thurnscoe

Client: Sirius Geotechnical Ltd					**Chemtest Job No.:**	18-29075	18-29075	18-29075
Quotation No.:					**Chemtest Sample ID.:**	693914	693915	693916
					Client Sample ID.:	WS01	WS02	TP02
					Sample Type:	SOIL	SOIL	SOIL
					Top Depth (m):	1.00	1.80	1.10
					Bottom Depth (m):	1.40	2.00	
					Date Sampled:	13-Sep-2018	13-Sep-2018	13-Sep-2018
Determinand	**Accred.**	**SOP**	**Units**	**LOD**				
Moisture	N	2030	%	0.020		8.2	7.4	7.5
Soil Colour	N	2040		N/A		Brown,	Beige,	Brown
Other Material	N	2040		N/A		Stones,	Stones,	Stones
Soil Texture	N	2040		N/A		Sand	Sand	Sand
pH	M	2010		N/A		7.6	7.6	5.1
Sulphate (2:1 Water Soluble) as SO4	M	2120	g/l	0.010		< 0.010	< 0.010	< 0.010

Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES

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Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis
The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols
For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

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Email: info@chemtest.com

Final Report

Report No.:	18-29107-1
Initial Date of Issue:	01-Oct-2018
Client	Sirius Geotechnical Ltd
Client Address:	4245 Park Approach Thorpe Park Leeds West Yorkshire LS15 8GB
Contact(s):	Gemma Halliday Richard Caine
Project	C8023 School Street, Phase 3, Thurnscoe

Quotation No.:	Q18-14657	**Date Received:**	24-Sep-2018
Order No.:	C8023/17523/GH	**Date Instructed:**	24-Sep-2018
No. of Samples:	4		
Turnaround (Wkdays):	5	**Results Due:**	28-Sep-2018
Date Approved:	01-Oct-2018		

Approved By:

Details: Robert Monk, Technical Manager

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Results - Soil

Project: C8023 School Street, Phase 3, Thurnscoe

Client: Sirius Geotechnical Ltd			**Chemtest Job No.:**		18-29107	18-29107	18-29107	18-29107
Quotation No.: Q18-14657			**Chemtest Sample ID.:**		694095	694097	694100	694102
			Client Sample ID.:		SA02	SA03	TP32	TP34
			Sample Type:		SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		1.00	0.90	1.00	1.30
			Date Sampled:		19-Sep-2018	19-Sep-2018	19-Sep-2018	19-Sep-2018
			Asbestos Lab:		DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**				
ACM Type	U	2192		N/A	-			
Asbestos Identification	U	2192	%	0.001	No Asbestos Detected			
Moisture	N	2030	%	0.020	6.5	12	12	7.9
Soil Colour	N	2040		N/A	Brown	Brown		
Other Material	N	2040		N/A	Stones	Stones		
Soil Texture	N	2040		N/A	Sand	Sand		
pH	M	2010		N/A	8.3	7.3	7.3	6.6
Electrical Conductivity (2:1)	N	2020	µS/cm	1.0			210	65
Sulphate (2:1 Water Soluble) as SO4	M	2120	g/l	0.010	0.026	0.058		
Redox Potential	N	2150	mV	N/A			170	200
Sulphate (Total)	M	2430	%	0.010	0.064	0.023		
Arsenic	M	2450	mg/kg	1.0	12	13		
Cadmium	M	2450	mg/kg	0.10	0.21	< 0.10		
Chromium	M	2450	mg/kg	1.0	18	17		
Copper	M	2450	mg/kg	0.50	28	23		
Mercury	M	2450	mg/kg	0.10	0.16	< 0.10		
Nickel	M	2450	mg/kg	0.50	16	22		
Lead	M	2450	mg/kg	0.50	54	22		
Selenium	M	2450	mg/kg	0.20	0.34	0.76		
Zinc	M	2450	mg/kg	0.50	73	32		
Total Organic Carbon	M	2625	%	0.20	2.1	< 0.20		
Aliphatic TPH >C5-C6	N	2680	mg/kg	0.010			< 0.010	< 0.010
Aliphatic TPH >C6-C8	N	2680	mg/kg	0.010			< 0.010	< 0.010
Aliphatic TPH >C8-C10	N	2680	mg/kg	0.10			< 0.10	< 0.10
Aliphatic TPH >C10-C12	N	2680	mg/kg	0.10			< 0.10	< 0.10
Aliphatic TPH >C12-C16	N	2680	mg/kg	0.10			< 0.10	< 0.10
Aliphatic TPH >C16-C21	N	2680	mg/kg	0.10			< 0.10	< 0.10
Aliphatic TPH >C21-C35	N	2680	mg/kg	0.10			< 0.10	< 0.10
Aliphatic TPH >C35-C44	N	2680	mg/kg	0.10			< 0.10	< 0.10
Total Aliphatic Hydrocarbons	N	2680	mg/kg	1.0			< 1.0	< 1.0
Aromatic TPH >C5-C7	N	2680	mg/kg	0.010			< 0.010	< 0.010
Aromatic TPH >C7-C8	N	2680	mg/kg	0.010			< 0.010	< 0.010
Aromatic TPH >C8-C10	N	2680	mg/kg	0.10			< 0.10	< 0.10
Aromatic TPH >C10-C12	N	2680	mg/kg	0.10			< 0.10	< 0.10
Aromatic TPH >C12-C16	N	2680	mg/kg	0.10			< 0.10	< 0.10
Aromatic TPH >C16-C21	N	2680	mg/kg	0.10			< 0.10	< 0.10
Aromatic TPH >C21-C35	N	2680	mg/kg	0.10			< 0.10	< 0.10
Aromatic TPH >C35-C44	N	2680	mg/kg	0.10			< 0.10	< 0.10

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Results - Soil

Project: C8023 School Street, Phase 3, Thurnscoe

Client: Sirius Geotechnical Ltd			**Chemtest Job No.:**		18-29107	18-29107	18-29107	18-29107
Quotation No.: Q18-14657			**Chemtest Sample ID.:**		694095	694097	694100	694102
			Client Sample ID.:		SA02	SA03	TP32	TP34
			Sample Type:		SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		1.00	0.90	1.00	1.30
			Date Sampled:		19-Sep-2018	19-Sep-2018	19-Sep-2018	19-Sep-2018
			Asbestos Lab:		DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**				
Total Aromatic Hydrocarbons	N	2680	mg/kg	1.0			< 1.0	< 1.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	2.0			< 2.0	< 2.0
Naphthalene	M	2700	mg/kg	0.10	0.26	< 0.10		
Acenaphthylene	M	2700	mg/kg	0.10	< 0.10	< 0.10		
Acenaphthene	M	2700	mg/kg	0.10	0.12	< 0.10		
Fluorene	M	2700	mg/kg	0.10	0.12	< 0.10		
Phenanthrene	M	2700	mg/kg	0.10	1.1	< 0.10		
Anthracene	M	2700	mg/kg	0.10	0.27	< 0.10		
Fluoranthene	M	2700	mg/kg	0.10	2.1	< 0.10		
Pyrene	M	2700	mg/kg	0.10	2.3	< 0.10		
Benzo[a]anthracene	M	2700	mg/kg	0.10	1.0	< 0.10		
Chrysene	M	2700	mg/kg	0.10	1.6	< 0.10		
Benzo[b]fluoranthene	M	2700	mg/kg	0.10	1.5	< 0.10		
Benzo[k]fluoranthene	M	2700	mg/kg	0.10	0.73	< 0.10		
Benzo[a]pyrene	M	2700	mg/kg	0.10	1.1	< 0.10		
Indeno(1,2,3-c,d)Pyrene	M	2700	mg/kg	0.10	0.49	< 0.10		
Dibenz(a,h)Anthracene	M	2700	mg/kg	0.10	0.33	< 0.10		
Benzo[g,h,i]perylene	M	2700	mg/kg	0.10	0.78	< 0.10		
Total Of 16 PAH's	M	2700	mg/kg	2.0	14	< 2.0		
Dichlorodifluoromethane	N	2760	µg/kg	0.20			< 0.20	< 0.20
Chloromethane	N	2760	µg/kg	0.20			< 0.20	< 0.20
Vinyl Chloride	N	2760	µg/kg	0.20			< 0.20	< 0.20
Bromomethane	N	2760	µg/kg	0.20			< 0.20	< 0.20
Chloroethane	N	2760	µg/kg	0.20			< 0.20	< 0.20
Trichlorofluoromethane	N	2760	µg/kg	0.20			< 0.20	< 0.20
1,1-Dichloroethene	N	2760	µg/kg	0.20			< 0.20	< 0.20
Trans 1,2-Dichloroethene	N	2760	µg/kg	0.20			< 0.20	< 0.20
1,1-Dichloroethane	N	2760	µg/kg	0.20			< 0.20	< 0.20
cis 1,2-Dichloroethene	N	2760	µg/kg	0.20			< 0.20	< 0.20
Bromochloromethane	N	2760	µg/kg	0.50			< 0.50	< 0.50
Trichloromethane	N	2760	µg/kg	0.20			< 0.20	< 0.20
1,1,1-Trichloroethane	N	2760	µg/kg	0.20			< 0.20	< 0.20
Tetrachloromethane	N	2760	µg/kg	0.20			< 0.20	< 0.20
1,1-Dichloropropene	N	2760	µg/kg	0.20			< 0.20	< 0.20
Benzene	N	2760	µg/kg	0.20			< 0.20	< 0.20
1,2-Dichloroethane	N	2760	µg/kg	0.20			< 0.20	< 0.20
Trichloroethene	N	2760	µg/kg	0.20			< 0.20	< 0.20
1,2-Dichloropropane	N	2760	µg/kg	0.20			< 0.20	< 0.20
Dibromomethane	N	2760	µg/kg	0.20			< 0.20	< 0.20

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Results - Soil

Project: C8023 School Street, Phase 3, Thurnscoe

Client: Sirius Geotechnical Ltd			**Chemtest Job No.:**		18-29107	18-29107	18-29107	18-29107
Quotation No.: Q18-14657			**Chemtest Sample ID.:**		694095	694097	694100	694102
			Client Sample ID.:		SA02	SA03	TP32	TP34
			Sample Type:		SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		1.00	0.90	1.00	1.30
			Date Sampled:		19-Sep-2018	19-Sep-2018	19-Sep-2018	19-Sep-2018
			Asbestos Lab:		DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**				
Bromodichloromethane	N	2760	µg/kg	0.20			< 0.20	< 0.20
cis-1,3-Dichloropropene	N	2760	µg/kg	0.20			< 0.20	< 0.20
Toluene	N	2760	µg/kg	0.20			< 0.20	< 0.20
Trans-1,3-Dichloropropene	N	2760	µg/kg	0.20			< 0.20	< 0.20
1,1,2-Trichloroethane	N	2760	µg/kg	0.20			< 0.20	< 0.20
Tetrachloroethene	N	2760	µg/kg	0.20			< 0.20	< 0.20
1,3-Dichloropropane	N	2760	µg/kg	0.20			< 0.20	< 0.20
Dibromochloromethane	N	2760	µg/kg	0.20			< 0.20	< 0.20
1,2-Dibromoethane	N	2760	µg/kg	0.20			< 0.20	< 0.20
Chlorobenzene	N	2760	µg/kg	0.20			< 0.20	< 0.20
1,1,1,2-Tetrachloroethane	N	2760	µg/kg	0.20			< 0.20	< 0.20
Ethylbenzene	N	2760	µg/kg	0.20			< 0.20	< 0.20
m & p-Xylene	N	2760	µg/kg	0.20			< 0.20	< 0.20
o-Xylene	N	2760	µg/kg	0.20			< 0.20	< 0.20
Styrene	N	2760	µg/kg	0.20			< 0.20	< 0.20
Tribromomethane	N	2760	µg/kg	0.20			< 0.20	< 0.20
Isopropylbenzene	N	2760	µg/kg	0.20			< 0.20	< 0.20
Bromobenzene	N	2760	µg/kg	0.20			< 0.20	< 0.20
1,2,3-Trichloropropane	N	2760	µg/kg	0.20			< 0.20	< 0.20
2-Chlorotoluene	N	2760	µg/kg	0.20			< 0.20	< 0.20
1,3,5-Trimethylbenzene	N	2760	µg/kg	0.20			< 0.20	< 0.20
4-Chlorotoluene	N	2760	µg/kg	0.20			< 0.20	< 0.20
Tert-Butylbenzene	N	2760	µg/kg	0.20			< 0.20	< 0.20
1,2,4-Trimethylbenzene	N	2760	µg/kg	0.20			< 0.20	< 0.20
Sec-Butylbenzene	N	2760	µg/kg	0.20			< 0.20	< 0.20
1,3-Dichlorobenzene	N	2760	µg/kg	0.20			< 0.20	< 0.20
4-Isopropyltoluene	N	2760	µg/kg	0.20			< 0.20	< 0.20
1,4-Dichlorobenzene	N	2760	µg/kg	0.20			< 0.20	< 0.20
N-Butylbenzene	N	2760	µg/kg	0.20			< 0.20	< 0.20
1,2-Dichlorobenzene	N	2760	µg/kg	0.20			< 0.20	< 0.20
1,2-Dibromo-3-Chloropropane	N	2760	µg/kg	0.20			< 0.20	< 0.20
1,2,4-Trichlorobenzene	N	2760	µg/kg	0.20			< 0.20	< 0.20
Hexachlorobutadiene	N	2760	µg/kg	0.20			< 0.20	< 0.20
1,2,3-Trichlorobenzene	N	2760	µg/kg	0.20			< 0.20	< 0.20
Methyl Tert-Butyl Ether	N	2760	µg/kg	0.20			< 0.20	< 0.20
N-Nitrosodimethylamine	N	2790	mg/kg	0.050			< 0.050	< 0.050
Phenol	N	2790	mg/kg	0.050			< 0.050	< 0.050
2-Chlorophenol	N	2790	mg/kg	0.050			< 0.050	< 0.050
Bis-(2-Chloroethyl)Ether	N	2790	mg/kg	0.050			< 0.050	< 0.050

Chemtest
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Results - Soil

Project: C8023 School Street, Phase 3, Thurnscoe

Client: Sirius Geotechnical Ltd			**Chemtest Job No.:**		18-29107	18-29107	18-29107	18-29107
Quotation No.: Q18-14657			**Chemtest Sample ID.:**		694095	694097	694100	694102
			Client Sample ID.:		SA02	SA03	TP32	TP34
			Sample Type:		SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		1.00	0.90	1.00	1.30
			Date Sampled:		19-Sep-2018	19-Sep-2018	19-Sep-2018	19-Sep-2018
			Asbestos Lab:		DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**				
1,3-Dichlorobenzene	N	2790	mg/kg	0.050			< 0.050	< 0.050
1,4-Dichlorobenzene	N	2790	mg/kg	0.050			< 0.050	< 0.050
1,2-Dichlorobenzene	N	2790	mg/kg	0.050			< 0.050	< 0.050
2-Methylphenol	N	2790	mg/kg	0.050			< 0.050	< 0.050
Bis(2-Chloroisopropyl)Ether	N	2790	mg/kg	0.050			< 0.050	< 0.050
Hexachloroethane	N	2790	mg/kg	0.050			< 0.050	< 0.050
N-Nitrosodi-n-propylamine	N	2790	mg/kg	0.050			< 0.050	< 0.050
4-Methylphenol	N	2790	mg/kg	0.050			< 0.050	< 0.050
Nitrobenzene	N	2790	mg/kg	0.050			< 0.050	< 0.050
Isophorone	N	2790	mg/kg	0.050			< 0.050	< 0.050
2-Nitrophenol	N	2790	mg/kg	0.050			< 0.050	< 0.050
2,4-Dimethylphenol	N	2790	mg/kg	0.050			< 0.050	< 0.050
Bis(2-Chloroethoxy)Methane	N	2790	mg/kg	0.050			< 0.050	< 0.050
2,4-Dichlorophenol	N	2790	mg/kg	0.050			< 0.050	< 0.050
1,2,4-Trichlorobenzene	N	2790	mg/kg	0.050			< 0.050	< 0.050
Naphthalene	N	2790	mg/kg	0.050			< 0.050	< 0.050
4-Chloroaniline	N	2790	mg/kg	0.050			< 0.050	< 0.050
Hexachlorobutadiene	N	2790	mg/kg	0.050			< 0.050	< 0.050
4-Chloro-3-Methylphenol	N	2790	mg/kg	0.050			< 0.050	< 0.050
2-Methylnaphthalene	N	2790	mg/kg	0.050			< 0.050	< 0.050
Hexachlorocyclopentadiene	N	2790	mg/kg	0.050			< 0.050	< 0.050
2,4,6-Trichlorophenol	N	2790	mg/kg	0.050			< 0.050	< 0.050
2,4,5-Trichlorophenol	N	2790	mg/kg	0.050			< 0.050	< 0.050
2-Chloronaphthalene	N	2790	mg/kg	0.050			< 0.050	< 0.050
2-Nitroaniline	N	2790	mg/kg	0.050			< 0.050	< 0.050
Acenaphthylene	N	2790	mg/kg	0.050			< 0.050	< 0.050
Dimethylphthalate	N	2790	mg/kg	0.050			< 0.050	< 0.050
2,6-Dinitrotoluene	N	2790	mg/kg	0.050			< 0.050	< 0.050
Acenaphthene	N	2790	mg/kg	0.050			< 0.050	< 0.050
Dibenzofuran	N	2790	mg/kg	0.050			< 0.050	< 0.050
4-Chlorophenylphenylether	N	2790	mg/kg	0.050			< 0.050	< 0.050
2,4-Dinitrotoluene	N	2790	mg/kg	0.050			< 0.050	< 0.050
Fluorene	N	2790	mg/kg	0.050			< 0.050	< 0.050
Diethyl Phthalate	N	2790	mg/kg	0.050			< 0.050	< 0.050
4-Nitroaniline	N	2790	mg/kg	0.050			< 0.050	< 0.050
2-Methyl-4,6-Dinitrophenol	N	2790	mg/kg	0.050			< 0.050	< 0.050
Azobenzene	N	2790	mg/kg	0.050			< 0.050	< 0.050
4-Bromophenylphenyl Ether	N	2790	mg/kg	0.050			< 0.050	< 0.050
Hexachlorobenzene	N	2790	mg/kg	0.050			< 0.050	< 0.050

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Results - Soil

Project: C8023 School Street, Phase 3, Thurnscoe

Client: Sirius Geotechnical Ltd			**Chemtest Job No.:**		18-29107	18-29107	18-29107	18-29107
Quotation No.: Q18-14657			**Chemtest Sample ID.:**		694095	694097	694100	694102
			Client Sample ID.:		SA02	SA03	TP32	TP34
			Sample Type:		SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		1.00	0.90	1.00	1.30
			Date Sampled:		19-Sep-2018	19-Sep-2018	19-Sep-2018	19-Sep-2018
			Asbestos Lab:		DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**Accred.**	**SOP**	**Units**	**LOD**				
Pentachlorophenol	N	2790	mg/kg	0.050			< 0.050	< 0.050
Phenanthrene	N	2790	mg/kg	0.050			< 0.050	< 0.050
Anthracene	N	2790	mg/kg	0.050			< 0.050	< 0.050
Carbazole	N	2790	mg/kg	0.050			< 0.050	< 0.050
Di-N-Butyl Phthalate	N	2790	mg/kg	0.050			< 0.050	< 0.050
Fluoranthene	N	2790	mg/kg	0.050			< 0.050	< 0.050
Pyrene	N	2790	mg/kg	0.050			< 0.050	< 0.050
Butylbenzyl Phthalate	N	2790	mg/kg	0.050			< 0.050	< 0.050
Benzo[a]anthracene	N	2790	mg/kg	0.050			< 0.050	< 0.050
Chrysene	N	2790	mg/kg	0.050			< 0.050	< 0.050
Bis(2-Ethylhexyl)Phthalate	N	2790	mg/kg	0.050			< 0.050	< 0.050
Di-N-Octyl Phthalate	N	2790	mg/kg	0.050			< 0.050	< 0.050
Benzo[b]fluoranthene	N	2790	mg/kg	0.050			< 0.050	< 0.050
Benzo[k]fluoranthene	N	2790	mg/kg	0.050			< 0.050	< 0.050
Benzo[a]pyrene	N	2790	mg/kg	0.050			< 0.050	< 0.050
Indeno(1,2,3-c,d)Pyrene	N	2790	mg/kg	0.050			< 0.050	< 0.050
Dibenz(a,h)Anthracene	N	2790	mg/kg	0.050			< 0.050	< 0.050
Benzo[g,h,i]perylene	N	2790	mg/kg	0.050			< 0.050	< 0.050
Resorcinol	M	2920	mg/kg	0.050			< 0.050	< 0.050
Phenol	M	2920	mg/kg	0.050			< 0.050	< 0.050
Cresols	M	2920	mg/kg	0.050			< 0.050	< 0.050
Xylenols	M	2920	mg/kg	0.050			< 0.050	< 0.050
1-Naphthol	N	2920	mg/kg	0.050			< 0.050	< 0.050
Trimethylphenols	M	2920	mg/kg	0.050			< 0.050	< 0.050
Total Phenols	M	2920	mg/kg	0.30	< 0.30	< 0.30	< 0.30	< 0.30
SVOC TIC	N	2790	mg/kg	N/A			None Detected	None Detected
VOC TIC	N	2760	µg/kg	N/A			None Detected	None Detected

Chemtest
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Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
2020	Electrical Conductivity	Electrical conductivity (EC) of aqueous extract or calcium sulphate solution for topsoil	Measurement of the electrical resistance of a 2:1 water/soil extract.
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2150	Redox Potential	Redox Potential	Meter
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2430	Total Sulphate in soils	Total Sulphate	Acid digestion followed by determination of sulphate in extract by ICP-OES.
2450	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2790	Semi-Volatile Organic Compounds (SVOCs) in Soils by GC-MS	Semi-volatile organic compounds(cf. USEPA Method 8270)	Acetone/Hexane extraction / GC-MS
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis
The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols
For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Chemtest
The right chemistry to deliver results
Chemtest Ltd.
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	18-31134-1
Initial Date of Issue:	16-Oct-2018
Client	Sirius Geotechnical Ltd
Client Address:	4245 Park Approach Thorpe Park Leeds West Yorkshire LS15 8GB
Contact(s):	Gemma Halliday Richard Caine
Project	C8023 - School Street, Phase 3, Thurnscoe

Quotation No.:		**Date Received:**	10-Oct-2018
Order No.:	C8023/17604/GH	**Date Instructed:**	10-Oct-2018
No. of Samples:	3		
Turnaround (Wkdays):	5	**Results Due:**	16-Oct-2018
Date Approved:	16-Oct-2018		

Approved By:

Details: Glynn Harvey, Laboratory Manager

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Results - Soil

Project: C8023 - School Street, Phase 3, Thurnscoe

Client: Sirius Geotechnical Ltd			**Chemtest Job No.:**		18-31134	18-31134	18-31134
Quotation No.:			**Chemtest Sample ID.:**		703830	703833	703835
			Client Sample ID.:		HP01	HP03	HP04
			Sample Type:		SOIL	SOIL	SOIL
			Top Depth (m):		0.10	0.00	0.10
			Bottom Depth (m):		0.35	0.10	0.20
			Date Sampled:		05-Oct-2018	05-Oct-2018	05-Oct-2018
			Asbestos Lab:		COVENTRY	COVENTRY	COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**			
ACM Type	U	2192		N/A	-	-	-
Asbestos Identification	U	2192	%	0.001	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Moisture	N	2030	%	0.020	18	16	17
Soil Colour	N	2040		N/A	Brown,	Brown,	Brown,
Other Material	N	2040		N/A	Stones,	Stones,	Stones,
Soil Texture	N	2040		N/A	Clay,	Clay,	Clay,
pH	U	2010		N/A	8.2	8.3	8.2
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010	< 0.010	< 0.010	< 0.010
Sulphate (Total)	U	2430	%	0.010	0.023	< 0.010	0.059
Arsenic	U	2450	mg/kg	1.0	13	23	25
Cadmium	U	2450	mg/kg	0.10	0.24	0.22	0.43
Chromium	U	2450	mg/kg	1.0	33	41	27
Copper	U	2450	mg/kg	0.50	22	30	23
Mercury	U	2450	mg/kg	0.10	0.11	0.13	0.19
Nickel	U	2450	mg/kg	0.50	26	41	21
Lead	U	2450	mg/kg	0.50	26	20	42
Selenium	U	2450	mg/kg	0.20	0.34	0.45	0.49
Zinc	U	2450	mg/kg	0.50	77	110	86
Total Organic Carbon	U	2625	%	0.20	0.82	0.41	2.1
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0		
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0		
Aliphatic TPH >C8-C10	U	2680	mg/kg	1.0	< 1.0		
Aliphatic TPH >C10-C12	U	2680	mg/kg	1.0	< 1.0		
Aliphatic TPH >C12-C16	U	2680	mg/kg	1.0	< 1.0		
Aliphatic TPH >C16-C21	U	2680	mg/kg	1.0	< 1.0		
Aliphatic TPH >C21-C35	U	2680	mg/kg	1.0	< 1.0		
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0		
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0		
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0		
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0		
Aromatic TPH >C8-C10	U	2680	mg/kg	1.0	< 1.0		
Aromatic TPH >C10-C12	U	2680	mg/kg	1.0	< 1.0		
Aromatic TPH >C12-C16	U	2680	mg/kg	1.0	< 1.0		
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0	< 1.0		
Aromatic TPH >C21-C35	U	2680	mg/kg	1.0	< 1.0		
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0		
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0		

Chemtest
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Results - Soil

Project: C8023 - School Street, Phase 3, Thurnscoe

Client: Sirius Geotechnical Ltd			**Chemtest Job No.:**		18-31134	18-31134	18-31134
Quotation No.:			**Chemtest Sample ID.:**		703830	703833	703835
			Client Sample ID.:		HP01	HP03	HP04
			Sample Type:		SOIL	SOIL	SOIL
			Top Depth (m):		0.10	0.00	0.10
			Bottom Depth (m):		0.35	0.10	0.20
			Date Sampled:		05-Oct-2018	05-Oct-2018	05-Oct-2018
			Asbestos Lab:		COVENTRY	COVENTRY	COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**			
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10		
Naphthalene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Acenaphthylene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Fluorene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Anthracene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	U	2700	mg/kg	0.10	< 0.10	< 0.10	0.25
Pyrene	U	2700	mg/kg	0.10	< 0.10	< 0.10	0.31
Benzo[a]anthracene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Chrysene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Benzo[a]pyrene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Total Of 16 PAH's	U	2700	mg/kg	2.0	< 2.0	< 2.0	< 2.0
Benzene	U	2760	µg/kg	1.0	< 1.0		
Toluene	U	2760	µg/kg	1.0	< 1.0		
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0		
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0		
o-Xylene	U	2760	µg/kg	1.0	< 1.0		
Methyl Tert-Butyl Ether	U	2760	µg/kg	1.0	< 1.0		
Total Phenols	U	2920	mg/kg	0.30	< 0.30	< 0.30	< 0.30

Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2430	Total Sulphate in soils	Total Sulphate	Acid digestion followed by determination of sulphate in extract by ICP-OES.
2450	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.

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Report Information

Key

U	UKAS accredited
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I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis
The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols
For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

LABORATORY REPORT

4043

Contract Number: PSL18/4818

Report Date: 11 October 2018

Client's Reference: C8023

Client Name: Sirius Leeds
4245 Park Approach
Century Way
Thorpe Park
Leeds
LS15 8GB

For the attention of: Gemma Halliday

Contract Title: School Street, Phase 3, Thurnscoe

Date Received: 21/9/2018
Date Commenced: 21/9/2018
Date Completed: 11/10/2018

Notes: Opinions and Interpretations are outside the UKAS Accreditation

A copy of the Laboratory Schedule of accredited tests as issued by UKAS is attached to this report. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced other than in full, without the prior written approval of the laboratory.

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SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
TP01		D	1.70		Brown gravelly sandy CLAY.
TP01		D	2.60		Grey slightly sandy very silty CLAY.
TP04		D	0.90		Brown mottled grey sandy CLAY.
TP05		D	0.60	0.80	Brown mottled grey sandy CLAY.
TP08		D	0.90		Brown slightly gravelly very sandy very silty CLAY.
TP09		B	0.60		Brown slightly gravelly sandy CLAY.
TP13		D	0.90		Brown mottled grey slightly gravelly sandy CLAY.
TP14		D	0.70		Brown mottled grey sandy CLAY.
TP15		D	1.30		Brown mottled grey sandy CLAY.
TP18		D	0.50		Brown mottled grey sandy CLAY.
TP19		D	0.70		Brown mottled grey slightly gravelly sandy CLAY.
TP21		D	1.10		Brown mottled grey sandy CLAY.
TP23		D	2.00		Brown mottled grey sandy CLAY.
TP24		D	0.90		Brown mottled grey slightly sandy CLAY.
TP26		B	0.40	0.60	Brown mottled grey slightly gravelly slightly sandy CLAY.
TP28		D	0.90		Brown mottled grey slightly gravelly sandy CLAY.
TP30		D	0.90		Brown slightly gravelly very sandy very silty CLAY.
WS03		D	0.80	1.00	Brown slightly gravelly sandy CLAY.
WS04		D	0.80	1.00	Brown mottled grey sandy CLAY.

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
WS05		D	0.60	0.80	Brown mottled grey sandy CLAY.
WS08		D	1.70	1.90	Brown mottled grey sandy CLAY.

UKAS TESTING
4043

Professional Soils Laboratory

School Street, Phase 3, Thurnscoe

Contract No:
PSL18/4818
Client Ref:
C8023

SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377 : PART 2 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content % Clause 3.2	Linear Shrinkage % Clause 6.5	Particle Density Mg/m^3 Clause 8.2	Liquid Limit % Clause 4.3/4	Plastic Limit % Clause 5.3	Plasticity Index % Clause 5.4	Passing .425mm %	Remarks
TP01		D	1.70		33							
TP01		D	2.60		19			53	26	27	100	High plasticity CH.
TP04		D	0.90		11			43	21	22	100	Intermediate plasticity CI.
TP05		D	0.60	0.80	19							
TP08		D	0.90		12			32	18	14	95	Low plasticity CL.
TP09		B	0.60		13			37	19	18	96	Intermediate plasticity CI.
TP13		D	0.90		13							
TP14		D	0.70		17			47	23	24	100	Intermediate plasticity CI.
TP15		D	1.30		15			45	22	23	100	Intermediate plasticity CI.
TP18		D	0.50		16			49	23	26	100	Intermediate plasticity CI.
TP19		D	0.70		15							
TP21		D	1.10		13			48	23	25	100	Intermediate plasticity CI.
TP23		D	2.00		19			41	20	21	100	Intermediate plasticity CI.
TP24		D	0.90		20			69	29	40	100	High plasticity CH.
TP28		D	0.90		11							
TP30		D	0.90		10			35	18	17	94	Intermediate plasticity CI.
WS03		D	0.80	1.00	12							
WS04		D	0.80	1.00	16							
WS05		D	0.60	0.80	11							

SYMBOLS : **NP : Non Plastic** *** : Liquid Limit and Plastic Limit Wet Sieved.**

UKAS TESTING 4043

PSL Professional Soils Laboratory

School Street, Phase 3, Thurnscoe

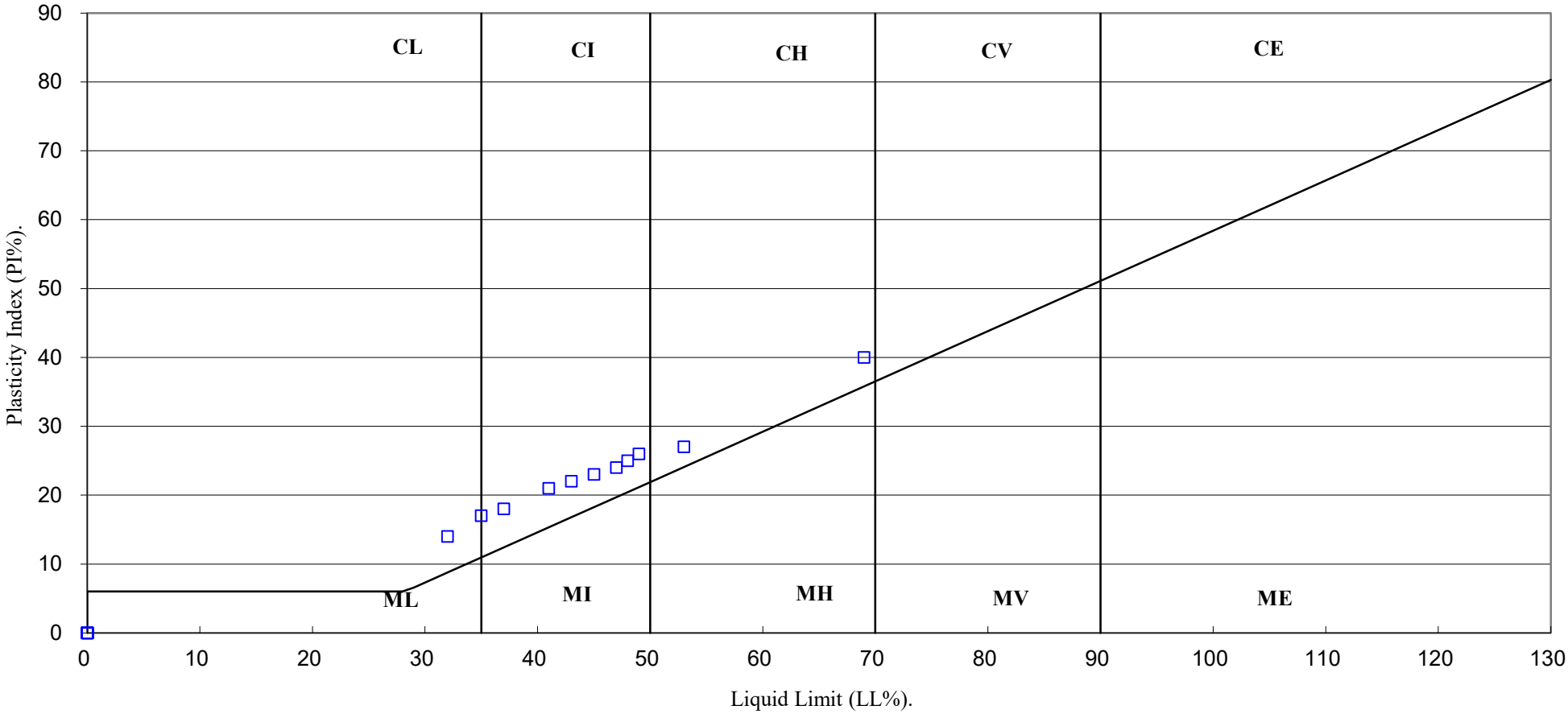
Contract No:

PSL18/4818

Client Ref:

C8023

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.



UKAS TESTING 4043	PSL Professional Soils Laboratory	School Street, Phase 3, Thurnscoe	Contract No: PSL18/4818
			Client Ref: C8023

SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377 : PART 2 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content % Clause 3.2	Linear Shrinkage % Clause 6.5	Particle Density Mg/m^3 Clause 8.2	Liquid Limit % Clause 4.3/4	Plastic Limit % Clause 5.3	Plasticity Index % Clause 5.4	Passing .425mm %	Remarks
WS08		D	1.70	1.90	13							

SYMBOLS : **NP : Non Plastic** *** : Liquid Limit and Plastic Limit Wet Sieved.**

UKAS TESTING 4043

PSL Professional Soils Laboratory

School Street, Phase 3, Thurnscoe

Contract No:

PSL18/4818

Client Ref:

C8023

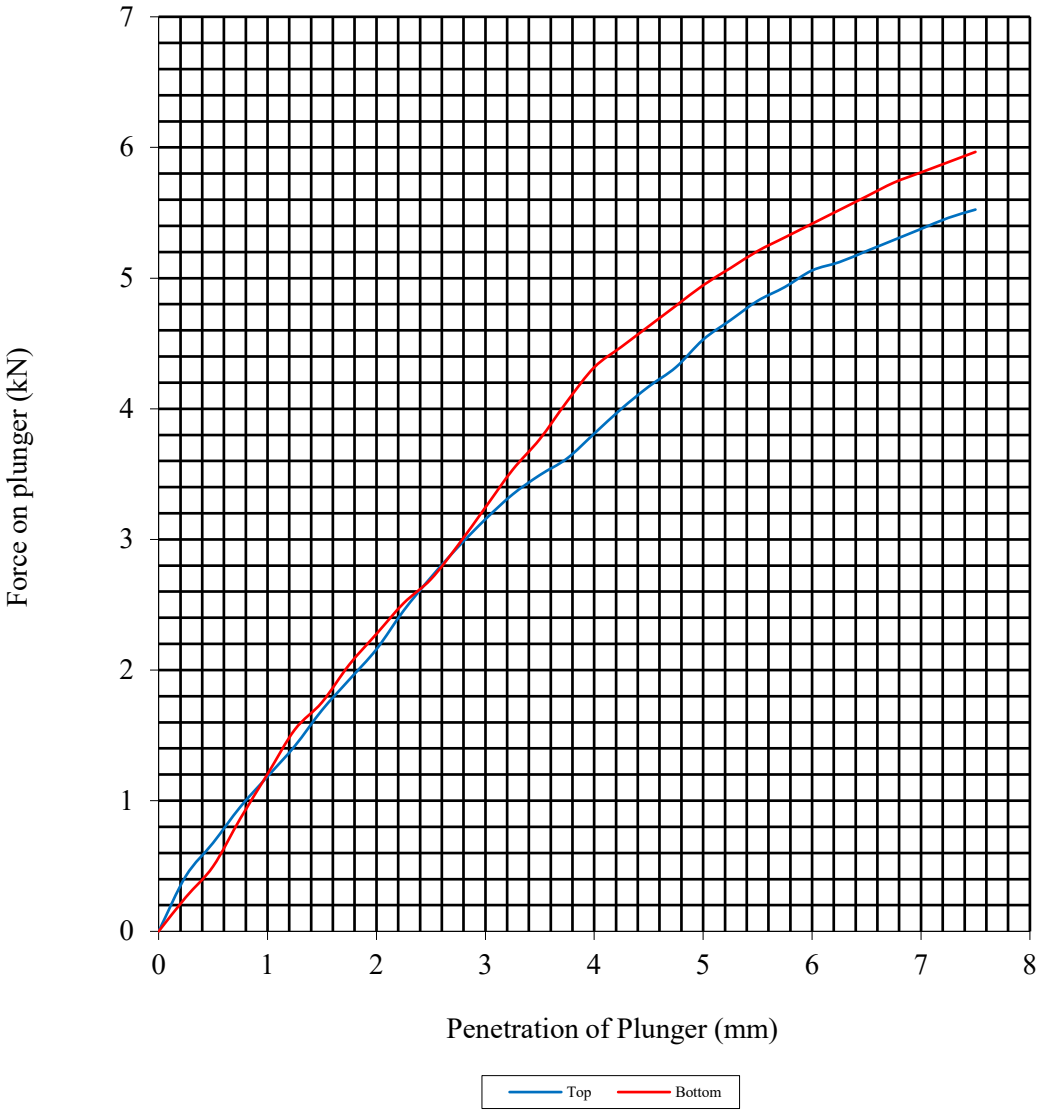
CALIFORNIA BEARING RATIO TEST

BS 1377 : Part 4 : 1990

Hole Number: TP09 **Top Depth (m):** 0.60

Sample Number: **Base Depth (m):** 0.80

Sample Type: B



Initial Sample Conditions		Sample Preparation		Final Moisture Content %		C.B.R. Value %	
Moisture Content:	13	Surcharge Kg:	4.20	Sample Top	13	Sample Top	22.6
Bulk Density Mg/m3:	1.91	Soaking Time hrs	0	Sample Bottom	13	Sample Bottom	24.7
Dry Density Mg/m3:	1.69	Swelling mm:	0	Remarks : See Summary of Soil Descriptions.			
Percentage retained on 20mm BS test sieve:			0				
Compaction Conditions		2.5kg					

UKAS TESTING 4043

PSL Professional Soils Laboratory

School Street, Phase 3, Thurnscoe

Contract No: PSL18/4818

Client Ref: C8023

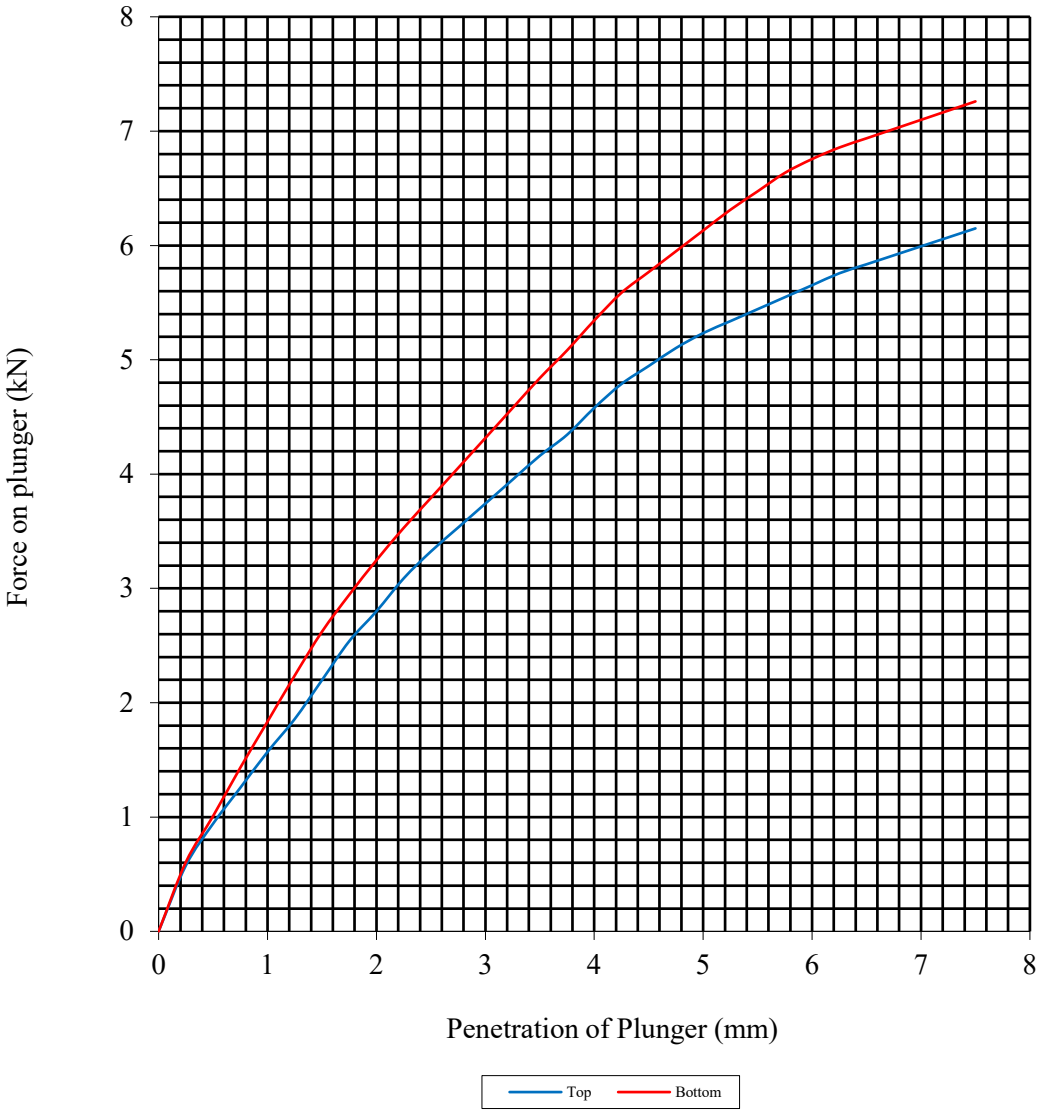
CALIFORNIA BEARING RATIO TEST

BS 1377 : Part 4 : 1990

Hole Number: TP26 **Top Depth (m):** 0.40

Sample Number: **Base Depth (m):** 0.60

Sample Type: B



Initial Sample Conditions		Sample Preparation		Final Moisture Content %		C.B.R. Value %	
Moisture Content:	24	Surcharge Kg:	4.20	Sample Top	24	Sample Top	26.2
Bulk Density Mg/m3:	1.94	Soaking Time hrs	0	Sample Bottom	24	Sample Bottom	30.7
Dry Density Mg/m3:	1.56	Swelling mm:	0	Remarks : See Summary of Soil Descriptions.			
Percentage retained on 20mm BS test sieve:			0				
Compaction Conditions		2.5kg					

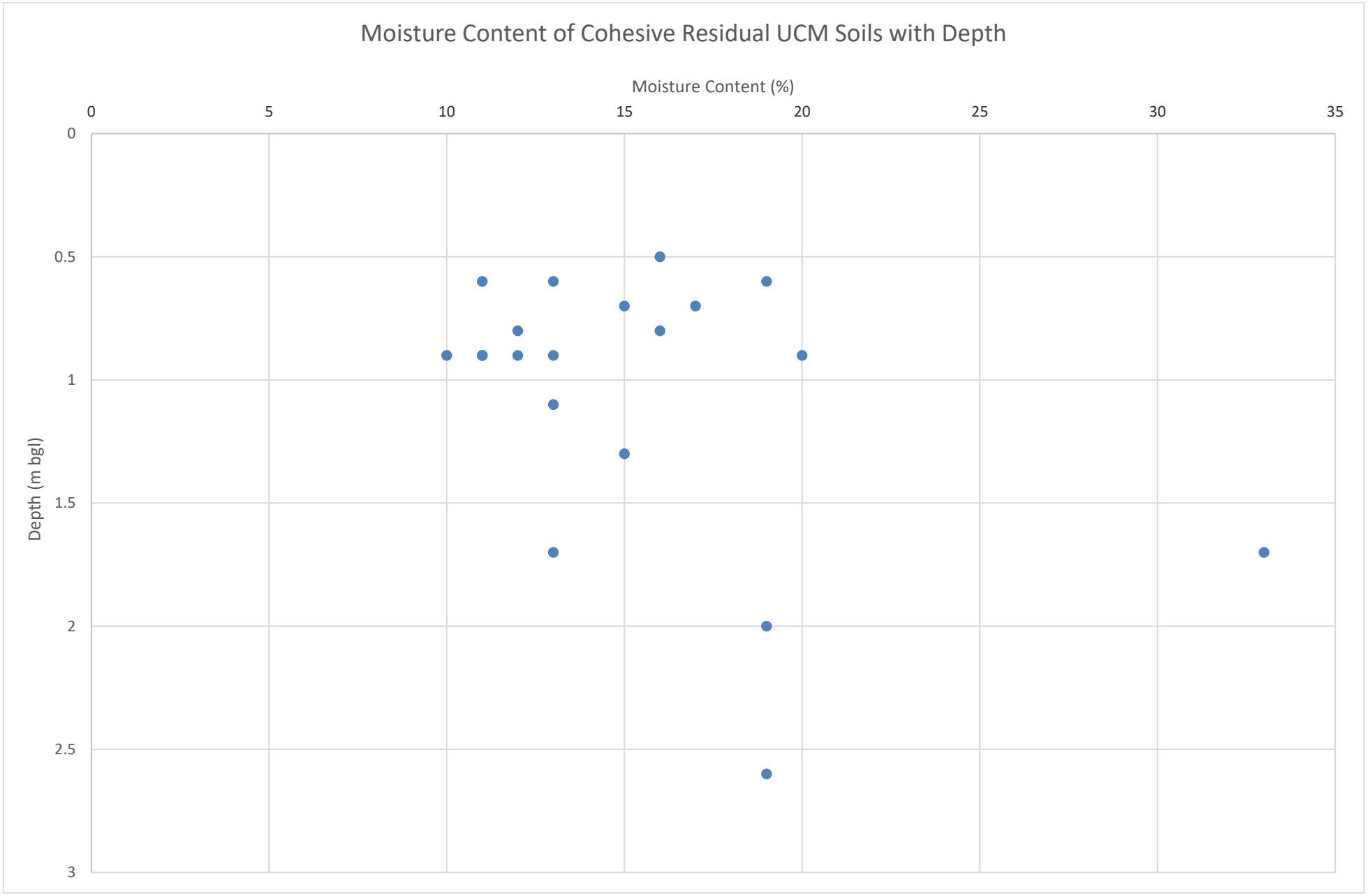
UKAS TESTING 4043

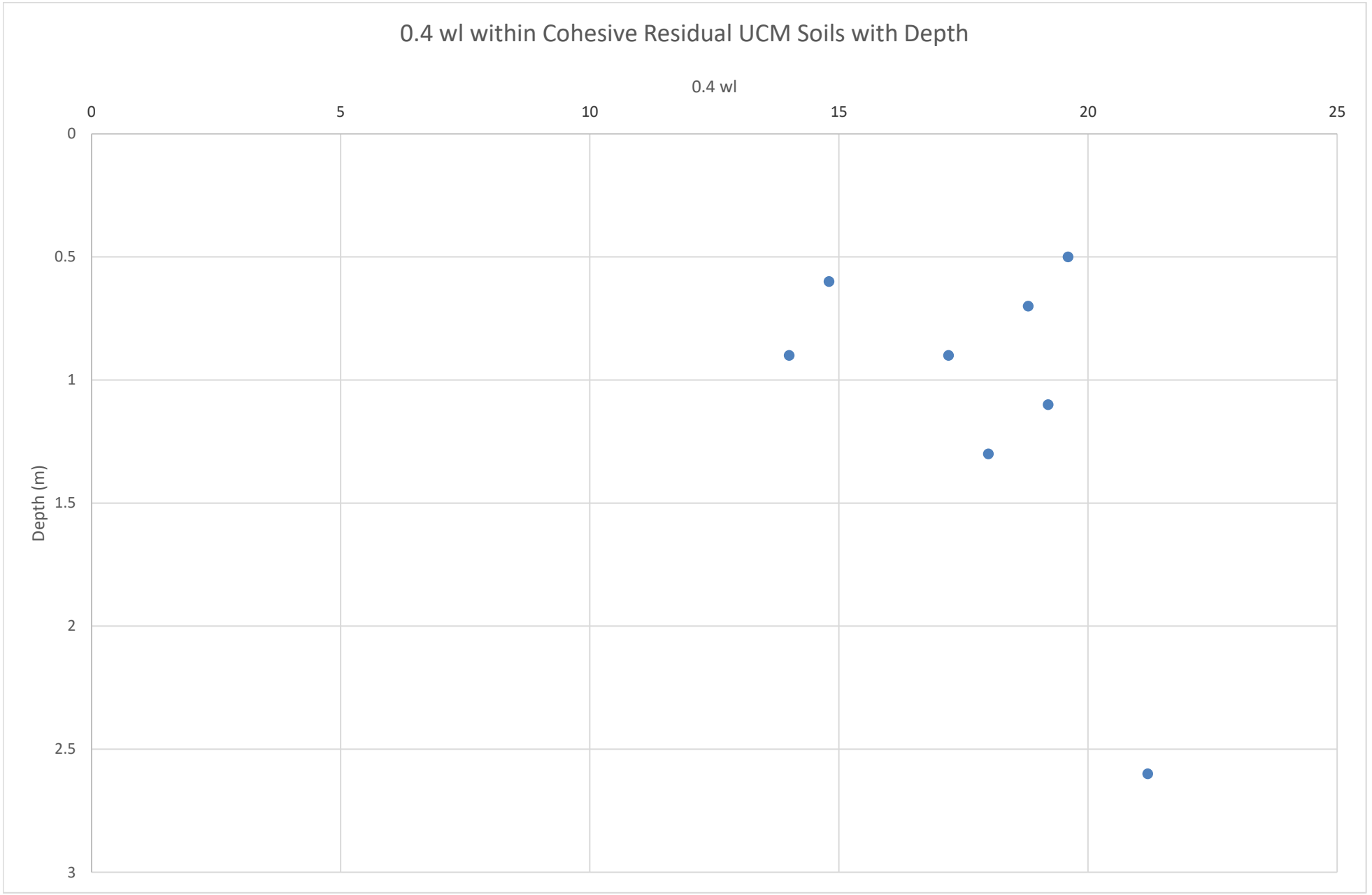
PSL Professional Soils Laboratory

School Street, Phase 3, Thurnscoe

Contract No: PSL18/4818

Client Ref: C8023


Moisture Content of Cohesive Residual UCM Soils with Depth
Moisture Content (%)
0
5
10
15
20
25
30
35
Depth (m bgl)
0
0.5
1
1.5
2
2.5
3


0.4 wl within Cohesive Residual UCM Soils with Depth
0.4 wl
0
5
10
15
20
25
0
0.5
1
1.5
2
2.5
3
Depth (m)

APPENDIX G

INTERIM GAS AND GROUNDWATER MONITORING RESULTS

Ground Gas and Groundwater Monitoring Record Sheet

JOB DETAILS:

Client: Keepmoat Homes
Site: Phase 3 (School Street), Thurnscoe
Date: 21/09/2018
Job No: C8023
Visit No: 1 **of** 6
Operator: RC
Project Manager: GH

Monitoring Point	GAS CONCENTRATIONS												VOLATILES		FLOW DATA				Qhg per borehole		WELL AND WATER DATA					Comments
	Methane (%v/v)		%LEL		Carbon dioxide (%v/v)		Carbon monoxide (ppmv)		Hydrogen sulphide (ppmv)		Oxygen (%v/v)		PID Peak (ppm)	Product thickness (mm)	Flow rate (l/hr)		Differential borehole Pressure (Pa)	Time for flow to equalise (secs)	Methane (l/hr)	CO2 (l/hr)	Water level (mbgl)	Depth of well (m)	Top of BH (mAOD)	Water level (mAOD)	Response Zone	
	Peak	Steady	Peak	Steady	Peak	**Steady**	Peak	Steady	Peak	Steady	Min.	Steady			Peak	Steady										
WS01	**ND**	ND	ND	ND	0.2	**0.2**	ND	ND	3	2	20.4	20.4	NR	NR	ND	ND	ND	NA	0.0001	0.0002	DRY	1.47	55.20	DRY	cohesive UCM	
WS02	**ND**	ND	ND	ND	0.1	**0.1**	ND	ND	3	2	20.5	20.5	NR	NR	ND	ND	ND	NA	0.0001	0.0001	DRY	1.92	53.80	DRY	cohesive UCM	
WS03	**ND**	ND	ND	ND	0.4	**0.4**	ND	ND	3	2	20.3	20.3	NR	NR	ND	ND	ND	NA	0.0001	0.0004	DRY	1.95	49.20	DRY	cohesive UCM / siltst	
WS04	**ND**	ND	ND	ND	ND	**ND**	ND	ND	3	2	20.7	20.7	NR	NR	ND	ND	ND	NA	0.0001	0.0001	DRY	0.99	54.10	DRY	cohesive UCM	
WS05	**ND**	ND	ND	ND	0.2	**0.2**	ND	ND	4	2	20.4	20.4	NR	NR	ND	ND	ND	NA	0.0001	0.0002	DRY	1.66	50.60	DRY	cohesive UCM / siltst	
WS06	**ND**	ND	ND	ND	0.2	**0.2**	ND	ND	4	2	20.4	20.4	NR	NR	-1.6	ND	ND	5	0.0016	0.0002	DRY	0.80	53.60	DRY	granular UCM / sst	
WS07	**ND**	ND	ND	ND	0.1	**0.1**	ND	ND	3	2	20.4	20.4	NR	NR	ND	ND	ND	NA	0.0001	0.0001	DRY	0.99	55.80	DRY	granular UCM / sst	
WS08	**ND**	ND	ND	ND	0.4	**0.4**	ND	ND	3	1	20.3	20.3	NR	NR	ND	ND	ND	NA	0.0001	0.0004	DRY	2.00	56.10	DRY	cohesive UCM	
Max	**ND**	**ND**	**ND**	**ND**	**0.4**	**0.4**	**ND**	**ND**	**4**	**2**	**20.7**	**20.7**	**NR**	**NR**	**-1.6**	**ND**	**ND**	**5**	**0.0016**	**0.0004**	**DRY**			**DRY**		
Min	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**3**	**1**	**20.3**	**20.3**	**NR**	**NR**	**ND**	**ND**	**ND**	**5**	**0.0001**	**0.0001**	**DRY**			**DRY**		

ND - Not detected

NR - Not recorded

NB: Where no flow (ND) recorded, Qhg values are calculated using equiment limit of detection (0.1l/hr). Where negative flows recorded, these are converted to positive values for calculation of Qhg.

cohesive UCM - cohesive residual Upper Coal Measures
granular UCM - granular residual Upper Coal Measures
siltst - siltstone bedrock
sst - sandstone bedrock

METEOROLOGICAL AND SITE INFORMATION: (Select correct box with X or enter data, as applicable)

State of ground:		Dry		Moist	X	Wet		Snow		Frozen
Wind:		Calm		Light		Moderate	X	Strong		
Cloud cover:		None		Slight		Cloudy	X	Overcast		
Precipitation:		None	X	Slight		Moderate		Heavy		
Time monitoring performed:			12:30	Start			14:00	End		
Barometric pressure (mbar):			999	Start			997	End		
Pressure trend (Daily):			X	Falling		Steady		Rising		
Source:	www.weatheronline.co.uk									
Air Temperature (Deg. C):			12	Before			11	After		

INSTRUMENTATION TECHNICAL SPECIFICATIONS:

Ground gas meter: GFM436 11570
Gas Range: **CH_4** 0 - 100% **CO_2** 0 - 100% **O_2** 0 - 25%
Gas Flow range: +100/-50 l/hour
Differential Pressure: (+/-) 1000 Pa
Date of last calibration: 25/03/2018
Date of next calibration: 25/03/2019

Ambient air check: **CH_4** ND **CO_2** ND **O_2** 20.6

Ground Gas and Groundwater Monitoring Record Sheet

JOB DETAILS:

Client: Keepmoat Homes **Job No:** C8023
Site: Phase 3 (School Street), Thurnscoe **Visit No:** 2 **of** 6
Date: 05/10/2018 **Operator:** RC **Project Manager:** GH

	GAS CONCENTRATIONS												VOLATILES		FLOW DATA				Qhg per borehole		WELL AND WATER DATA					Comments
Monitoring Point	Methane (%v/v)		%LEL		Carbon dioxide (%v/v)		Carbon monoxide (ppmv)		Hydrogen sulphide (ppmv)		Oxygen (%v/v)		PID Peak (ppm)	Product thickness (mm)	Flow rate (l/hr)		Differential borehole Pressure (Pa)	Time for flow to equalise (secs)	Methane (l/hr)	CO2 (l/hr)	Water level (mbgl)	Depth of well (m)	Top of BH (mAOD)	Water level (mAOD)	Response Zone	
	Peak	Steady	Peak	Steady	Peak	**Steady**	Peak	Steady	Peak	Steady	Min.	Steady			Peak	Steady										
WS01	**ND**	ND	ND	ND	0.3	**0.3**	ND	ND	1	ND	20.5	20.5	NR	NR	ND	ND	ND	ND	0.0001	0.0003	DRY	1.47	55.20	DRY	cohesive UCM	
WS02	**ND**	ND	ND	ND	0.3	**0.3**	ND	ND	1	ND	20.6	20.6	NR	NR	ND	ND	ND	ND	0.0001	0.0003	DRY	1.92	53.80	DRY	cohesive UCM	
WS03	**ND**	ND	ND	ND	0.5	**0.5**	1	ND	1	ND	20.5	20.5	NR	NR	ND	ND	ND	ND	0.0001	0.0005	DRY	1.95	49.20	DRY	cohesive UCM / siltst	
WS04	**ND**	ND	ND	ND	0.1	**0.1**	1	ND	1	ND	20.8	20.8	NR	NR	0.3	ND	ND	1	0.0003	0.0001	DRY	0.99	54.10	DRY	cohesive UCM	
WS05	**ND**	ND	ND	ND	0.2	**0.2**	ND	ND	2	ND	20.7	20.7	NR	NR	ND	ND	ND	ND	0.0001	0.0002	DRY	1.66	50.60	DRY	cohesive UCM / siltst	
WS06	**ND**	ND	ND	ND	0.4	**0.4**	ND	ND	1	ND	20.5	20.5	NR	NR	ND	ND	ND	ND	0.0001	0.0004	DRY	0.80	53.60	DRY	granular UCM / sst	
WS07	**ND**	ND	ND	ND	0.4	**0.4**	ND	ND	1	ND	20.5	20.5	NR	NR	ND	ND	ND	ND	0.0001	0.0004	DRY	0.99	55.80	DRY	granular UCM / sst	
WS08	**ND**	ND	ND	ND	0.4	**0.4**	ND	ND	1	ND	20.6	20.6	NR	NR	ND	ND	ND	ND	0.0001	0.0004	DRY	2.00	56.10	DRY	cohesive UCM	
Max	**ND**	**ND**	**ND**	**ND**	**0.5**	**0.5**	**1**	**ND**	**2**	**ND**	**20.8**	**20.8**	**NR**	**NR**	**0.3**	**ND**	**ND**	**1**	**0.0003**	**0.0005**	**DRY**			**DRY**		
Min	**ND**	**ND**	**ND**	**ND**	**0.1**	**0.1**	**ND**	**ND**	**1**	**ND**	**20.5**	**20.5**	**NR**	**NR**	**ND**	**ND**	**ND**	**ND**	**0.0001**	**0.0001**	**DRY**			**DRY**		

ND - Not detected

NR - Not recorded

NB: Where no flow (ND) recorded, Qhg values are calculated using equiment limit of detection (0.1l/hr). Where negative flows recorded, these are converted to positive values for calculation of Qhg.

METEOROLOGICAL AND SITE INFORMATION: (Select correct box with X or enter data, as applicable)

State of ground:		Dry	X	Moist		Wet		Snow		Frozen
Wind:		Calm	X	Light		Moderate		Strong		
Cloud cover:		None		Slight	X	Cloudy		Overcast		
Precipitation:	X	None		Slight		Moderate		Heavy		
Time monitoring performed:			10:30	Start			12:00	End		
Barometric pressure (mbar):			1009	Start			1008	End		
Pressure trend (Daily):				Falling	x	Steady		Rising		
Source:	www.weatheronline.co.uk									
Air Temperature (Deg. C):			13	Before			14	After		

INSTRUMENTATION TECHNICAL SPECIFICATIONS:

Ground gas meter: GFM436 11570
Gas Range: **CH_4** 0 - 100% **CO_2** 0 - 100% **O_2** 0 - 25%
Gas Flow range: +100/-50 l/hour
Differential Pressure: (+/-) 1000 Pa
Date of last calibration: 25/03/2018
Date of next calibration: 25/03/2019

Ambient air check: **CH_4** ND **CO_2** ND **O_2** 20.6

Ground Gas and Groundwater Monitoring Record Sheet

Summary of all gas monitoring events

JOB DETAILS:

Client: Keepmoat Homes **Job No:** C8023
Site: Phase 3 (School Street), Thurnscoe
Start Date: 21/09/2018
End Date: 05/10/2018 **No. events:** 2

	GAS CONCENTRATIONS												PID	FLOW DATA						Max. Qhg Recorded		Worst-credible Qhg		Comments
Monitoring Point	Methane (%v/v)		%LEL		Carbon dioxide (%v/v)		Carbon monoxide (ppmv)		Hydrogen sulphide (ppmv)		Oxygen (%v/v)		Peak (ppm)	Peak flow rate (l/hr)		Steady flow rate (l/hr)		Differential borehole Pressure (Pa)	Time for flow to equalise (secs)	Methane (l/hr)	CO2 (l/hr)	Methane (l/hr)	CO2 (l/hr)	
	Peak	Steady	Peak	Steady	Peak	**Steady**	Peak	Steady	Peak	Steady	Min.	Steady		Max.	Min.	Max.	Min.						
WS01	**ND**	ND	ND	ND	0.3	**0.3**	ND	ND	3	2	20.4	20.4	ND	ND	ND	ND	ND	ND	ND	0.0001	0.0003	0.0001	0.0003	
WS02	**ND**	ND	ND	ND	0.3	**0.3**	ND	ND	3	2	20.5	20.5	ND	ND	ND	ND	ND	ND	ND	0.0001	0.0003	0.0001	0.0003	
WS03	**ND**	ND	ND	ND	0.5	**0.5**	1	ND	3	2	20.3	20.3	ND	ND	ND	ND	ND	ND	ND	0.0001	0.0005	0.0001	0.0005	
WS04	**ND**	ND	ND	ND	0.1	**0.1**	1	ND	3	2	20.7	20.7	ND	0.3	ND	ND	ND	ND	1	0.0003	0.0001	0.0003	0.0001	
WS05	**ND**	ND	ND	ND	0.2	**0.2**	ND	ND	4	2	20.4	20.4	ND	ND	ND	ND	ND	ND	ND	0.0001	0.0002	0.0001	0.0002	
WS06	**ND**	ND	ND	ND	0.4	**0.4**	ND	ND	4	2	20.4	20.4	ND	-1.6	-1.6	ND	ND	ND	5	0.0016	0.0004	0.0016	0.0004	
WS07	**ND**	ND	ND	ND	0.4	**0.4**	ND	ND	3	2	20.4	20.4	ND	ND	ND	ND	ND	ND	ND	0.0001	0.0004	0.0001	0.0004	
WS08	**ND**	ND	ND	ND	0.4	**0.4**	ND	ND	3	1	20.3	20.3	ND	ND	ND	ND	ND	ND	ND	0.0001	0.0004	0.0001	0.0004	
Max	**ND**	**ND**	**ND**	**ND**	**0.5**	**0.5**	**1**	**ND**	**4**	**2**	**20.7**	**20.7**	**ND**	**0.3**	**-1.6**	**ND**	**ND**	**ND**	**5**	**0.0016**	**0.0005**	**0.0016**	**0.0005**	
Min	**ND**	**ND**	**ND**	**ND**	**0.1**	**0.1**	**ND**	**ND**	**3**	**1**	**20.3**	**20.3**	**ND**	**-1.6**	**-1.6**	**ND**	**ND**	**ND**	**ND**	**0.0001**	**0.0001**	**0.0001**	**0.0001**	

		Worst-possible Qhg	
ND - Not detected			
NR - Not recorded		**0.0016**	**0.0005**

Qhg calculated for methane on the basis of peak flow and concentration (short-term explosive risk).
Qhg calculated for carbon dioxide on the basis of steady flow and concentration (risk of long-term accumulation of suffocating mixture).
For calculation purposes, it is assumed that negative flows could be realised as positive flows.
Max. Qhg recorded is the highest Qhg determined in any individual monitoring event.
Worst-credible Qhg is the value calculated from the highest concentration and flow recorded in any monitoring event for an individual borehole.
Worst-possible Qhg is the value calculated from the highest concentration and flow recorded in any monitoring event for any borehole.

Ground Gas and Groundwater Monitoring Record Sheet

Summary of Groundwater Data

JOB DETAILS:

Client: Keepmoat Homes
Site: Phase 3 (School Street), Thurnscoe
Start Date: 21/09/2018
End Date: 05/10/2018

Job No: C8023
No. events: 2

Monitoring Point	Product thickness (mm)	Water level (mbgl)		Water level (mAOD)		Water level range (m)	Response zone
	Max.	Max.	Min.	Max.	Min.		
WS01	ND	DRY or NR	DRY or NR	55.20	DRY or NR	Can't calc.	cohesive UCM
WS02	ND	DRY or NR	DRY or NR	53.80	DRY or NR	Can't calc.	cohesive UCM
WS03	ND	DRY or NR	DRY or NR	49.20	DRY or NR	Can't calc.	cohesive UCM / siltst
WS04	ND	DRY or NR	DRY or NR	54.10	DRY or NR	Can't calc.	cohesive UCM
WS05	ND	DRY or NR	DRY or NR	50.60	DRY or NR	Can't calc.	cohesive UCM / siltst
WS06	ND	DRY or NR	DRY or NR	53.60	DRY or NR	Can't calc.	granular UCM / sst
WS07	ND	DRY or NR	DRY or NR	55.80	DRY or NR	Can't calc.	granular UCM / sst
WS08	ND	DRY or NR	DRY or NR	56.10	DRY or NR	Can't calc.	cohesive UCM
Max.	**ND**	**NR**	**NR**	**56.10**	**NR**	**DRY or NR**	
Min.	**NR**	**NR**	**NR**	**NR**	**DRY or NR**	**DRY or NR**	

APPENDIX H

SIRIUS GENERIC ASSESSMENT CRITERIA

SIRIUS GENERIC ASSESSMENT CRITERIA

Context

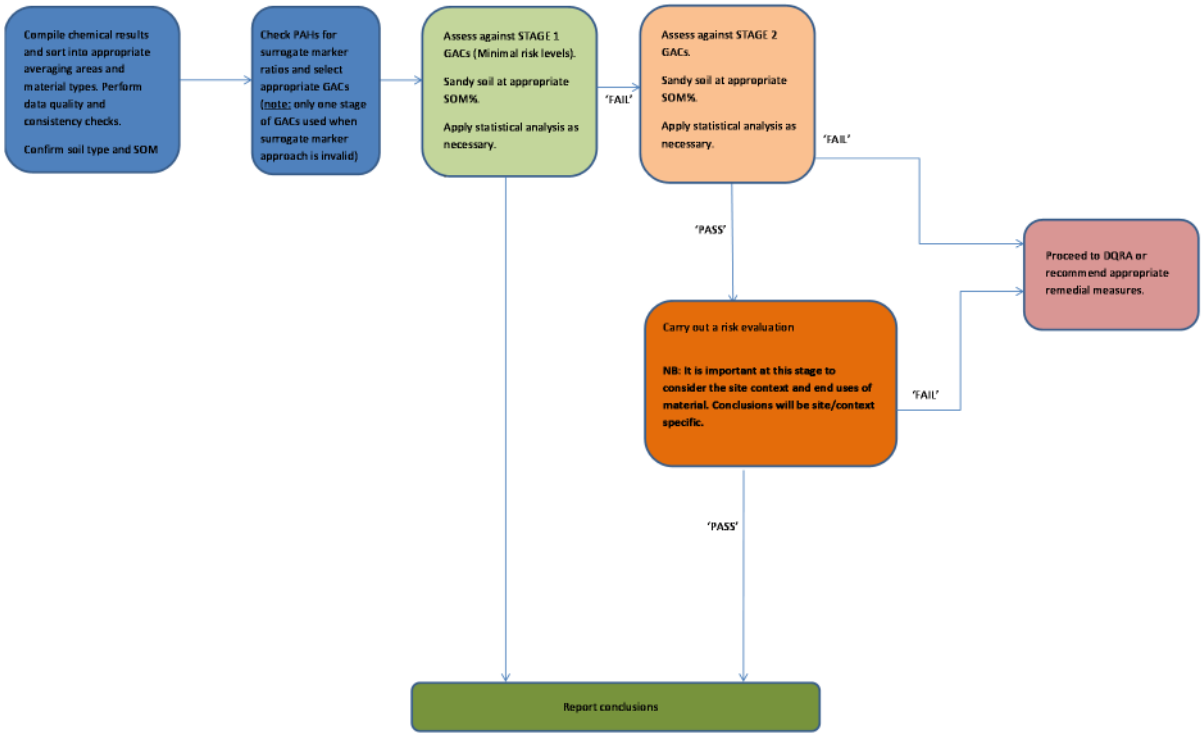
The framework for conducting site investigations, risk assessments and undertaking any necessary remedial works in the UK is provided by Environment Agency report CLR11 "Model Procedures for the Management of Contaminated Land". This presents a phased approach to risk assessment, involving: identification and qualitative assessment of potential pollutant linkages (source-pathway-receptor relationships) by means of a Conceptual Site Model; Generic Quantitative Risk Assessment (GQRA) of potentially significant pollutant links by comparing contaminant concentrations with appropriate Generic Assessment Criteria (GAC) values; and, if required, a Detailed Quantitative Risk Assessment (DQRA) based on site-specific conditions.

Assessment of Risk to Human Health

Introduction

A staged approach to GQRA has been adopted by Sirius for the evaluation of soil concentration data, as shown schematically in Figure 1.

Figure 1. GQRA Process.



The first stage of GQRA comprises assessment of the data against GAC values derived using toxicological parameter values based on "minimum risk". Any contaminants exceeding their GACs at this stage are further assessed against Stage 2 GACs, which have been derived using Low Level of Toxicological Concern (LLTC) criteria, where these are available.

With appropriate justification, a contaminant concentration that does not exceed the relevant Stage 2 GAC value may be considered to indicate that the land is "suitable for use". The appropriate use of LLTC-based criteria within the planning regime is considered reasonable by government agencies, as most recently highlighted in the letter (dated 3rd September 2014) to all local authorities from Lord de Mauley, Parliamentary Under Secretary at DEFRA.

A narrative "risk evaluation" must therefore accompany any Stage 2 assessment to justify the conclusions drawn. Where appropriate, this may provide a basis for eliminating from further consideration those contaminants whose concentrations do not exceed the applicable Stage 2 GAC value.

For the specific case of lead, the Category 4 Screening Level criteria given in CL:AIRE (2014)[1] have been adopted directly as GACs, as these are considered to be based on expert interpretation of current toxicological evidence.

In some areas, background concentrations of lead, other metals and metalloids, and/or individual PAHs may exceed their respective GACs and it may be appropriate to consider relative site and background concentration data as part of a more detailed assessment of the data.

Derivation of GACs

Except where otherwise stated, GACs have been derived by Sirius using CLEA version 1.071.

The GAC values have been derived for a sandy soil type, which will be conservative for the majority of soils (including made ground) encountered on historically contaminated sites. For organic contaminants of concern, criteria have been derived for a number of Soil Organic Matter (SOM) contents.

Genotoxic PAHs are assessed by the "Surrogate Method" using benzo(a)pyrene. Further information on this approach is given below.

Unless specifically stated, chemical properties and Health Criteria Values (HCVs) were obtained from:

- Environment Agency Science Report SC050021 series;
- Nathanail *et al*. (2009) "The LQM/CIEH Generic Assessment Criteria for Human Health Risk Assessment", 2nd edition, Land Quality Press, Nottingham;
- CL:AIRE - AGS - EIC (2010) "Soil Generic Assessment Criteria for Human Health Risk Assessment". CL:AIRE, London.

GACs for arsenic, benzene, benzo(a)pyrene, cadmium and chromium (VI) have been derived using the

[1] CL:AIRE (2014) "Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination", Report SP1010, rev. 2.

Low Level of Toxicological Concern (LLTC) criteria given in CL:AIRE (2013). These criteria are considered a reasonable basis for assessment as they are still highly precautionary and definitely do not approach an intake level that could be defined as approaching Significant Possibility of Significant Harm to human health in the context of Part 2A of the Environmental Protection Act 1990. It must be further understood that the GACs derived will still incorporate a residual level of conservatism resulting from the exposure parameters used and the assumptions inherent in the model algorithms.

GACs for Genotoxic PAHs

Our approach to the assessment of genotoxic PAHs retains the use of benzo(a)pyrene as a surrogate marker. This approach for genotoxic PAHs is recommended by the HPA (2010)[2], which we consider to be the authoritative current guidance produced by a UK expert body and note that it was retained in the DEFRA Category 4 Screening Levels project (CL:AIRE, 2014).

The surrogate marker approach allows the assessment of the combined carcinogenic risk associated with all genotoxic PAHs[3] present as a mixture within soil, even though detailed toxicological information for many of the individual compounds may be lacking. The approach is based on determining the risk posed by the genotoxic PAH mixture using the concentration of benzo(a)pyrene present as an indicator.

To use the GAC for benzo(a)pyrene as a surrogate marker, a number of requirements must be met (HPA, 2010):

- Benzo(a)pyrene must be present in all soil samples containing genotoxic PAHs for which this method of assessment is being used;
- A similar profile of the genotoxic PAHs relative to benzo(a)pyrene should be present in all of the samples being assessed;
- The PAH profile of PAHs in the soil samples should be similar to that present in the pivotal toxicity study on which toxicological criterion for benzo(a)pyrene was based (Culp et al., 1998[4]). Table 1 provides the basis for defining the acceptable range.

Data indicate that contaminated soils in the UK generally meet these criteria[5] but the assessor must review their dataset before adopting this approach. If the above criteria are not met, then the surrogate marker approach must not be adopted and individual GAC or SSAC values are to be applied.

[2] HPA (2010) "Risk Assessment Approaches for Polycyclic Aromatic Hydrocarbons (PAHs)", version 5.

[3] The genotoxic PAHs included in the USEPA PAH 16 analysis reported by analytical labs are: benz[a]anthracene, benzo[b]fluoranthene, benzo[k]fluoranthene, benzo[g,h,i]perylene, benzo(a)pyrene, chrysene, dibenz[a,h]anthracene and indeno[1,2,3-c,d]pyrene.

[4] Culp, S. *et al*. (1998) Carcinogenesis, 19, 117-124.

[5] Bull, S. & Collins, C. (2013) Environ. Geochem. Health, 31, 101-109.

Table 1. Profile of Genotoxic PAHs Relative to Benzo(a)pyrene that are Considered Acceptable for Application of Benzo(a)pyrene as a Surrogate Marker.

PAH	Acceptable Ratio of PAH Concentration to Benzo(a)pyrene for Application of Surrogate Marker Assessment	
	Lower Limit	Upper Limit
Benz[a]anthracene	0.12	12.43
Benzo[b]fluoranthene	0.11	10.85
Benzo[k]fluoranthene	0.04	3.72
Benzo[g,h,i]perylene	0.08	8.22
Chrysene	0.12	11.61
Dibenz[a,h]anthracene	0.01	1.38
Indeno[1,2,3-c,d]pyrene	0.07	7.27

For further information see: HPA (2010).

Soil Criteria Set for Purposes Other Than Human Health Protection

The Sirius GACs for sulphate, total organic carbon (TOC) and calorific value are set on basis of risks other than human health and their exceedance does not indicate a potential risk to future site users:

- The GAC for sulphate content is based on potential detrimental effects on buried concrete[6] and must be assessed with reference to the soil pH;
- The GAC for TOC content is provided for indicative assessment of disposal options if off-site landfill of soil were to be considered. This GAC is set at the 'Inert' waste threshold and should be considered as being applied for information purposes only;
- The GAC for calorific value is set to assist in an initial assessment of the potential fire risk posed by made ground or natural soils containing elevated concentrations of potentially combustible organic matter.

Assessment criteria more stringent than those for human health may be set for specific purposes, for example, elimination of nuisance odours or ensuring that potentially mobile free-phase organic products are not present.

Controlled Waters

The Environment Agency's "Remedial Targets Methodology" (2006) provides a framework for assessing the potential for pollution of controlled waters and for deriving remedial target concentrations in soil and groundwater.

There are no generic groundwater or surface water quality standards that are applicable to all sites. Drinking Water Standards and Environmental Quality Standards (EQS) are used by Sirius as assessment criteria where they are appropriate to the contaminant linkages under consideration. Given that these standards apply at the receptor point, this is a conservative approach for samples collected at a source or along a transport pathway.

[6] BRE (2005) "Concrete in Aggressive Ground", Special Digest No. 1; 3rd Edition.

Soil Leachability

Sirius specifies that the analytical laboratory undertakes leachate preparation by BS EN 12475-2:2002. Where specific circumstances require a different method to be used, then this will be explained and justified within the report body text.

The results of leachate analysis are compared to the relevant GAC values for controlled waters.

The Sirius Group
Stage 1 Generic Assessment Criteria for Soils

Revision: 20th August 2015

Parameter	Residential (mg/kg, unless otherwise stated)						Commercial / Industrial (mg/kg, unless otherwise stated)			Note
	With Homegrown Produce			Without Homegrown Produce						
	1% SOM	2.5% SOM	5% SOM	1% SOM	2.5% SOM	5% SOM	1% SOM	2.5% SOM	5% SOM	
Metals/Metalloids										
Arsenic (inorganic)	37			40			630			[1]
Cadmium	11			85			190			[2]
Chromium (III)	910			4000			8600			
Chromium (VI)	6.0			6.1			33			[3]
Copper	200			7100			68000			[4]
Lead	200			310			2300			[5]
Mercury (inorganic)	40			56			1100			[6]
Nickel	130			180			980			[7]
Selenium	250			430			12000			
Vanadium	410			1200			9000			
Zinc	450			40000			750000			[4]
Other Inorganics										
pH	<5 or >9			<5 or >9			<5 or >9			
Total Sulphate	2400			2400			2400			[8]
Water-Soluble Sulphate	0.5 g/l			0.5 g/l			0.5 g/l			[8]
Free Cyanide	34			34			1400			[9]
Organics										
PAHs										
Acenaphthene	200	490	920	2000	3600	4900	75000	92000	100000	
Acenaphthylene	170	400	760	2000	3600	4900	76000	93000	100000	
Anthracene	2300	5300	9400	30000	34000	36000	520000	540000	540000	[10]
Benzo(a)anthracene	Assessed using benzo(a)pyrene as a surrogate marker									[10]
Benzo(a)pyrene	2.1	2.1	2.2	2.3	2.3	2.3	27	27	27	[11]
Benzo(b)fluoranthene	Assessed using benzo(a)pyrene as a surrogate marker									[10]
Benzo(k)fluoranthene	Assessed using benzo(a)pyrene as a surrogate marker									[10]
Benzo(g,h,i)perylene	Assessed using benzo(a)pyrene as a surrogate marker									[10]
Chrysene	Assessed using benzo(a)pyrene as a surrogate marker									[10]
Dibenzo(a,h)anthracene	Assessed using benzo(a)pyrene as a surrogate marker									[10]
Fluoranthene	280	560	820	1500	1600	1600	23000	23000	23000	
Fluorene	170	390	730	2200	3400	4000	60000	67000	70000	
Indeno(1,2,3-c,d)pyrene	Assessed using benzo(a)pyrene as a surrogate marker									[10]
Naphthalene	1.0	2.3	4.6	1.0	2.4	4.7	110	260	510	
Phenanthrene	95	220	380	1300	1400	1500	22000	22000	23000	
Pyrene	620	1200	1900	3700	3800	3800	54000	54000	54000	
BTEX and related										
Benzene	0.063	0.13	0.24	0.16	0.30	0.38	15	28	49	
Toluene	100	240	460	370	830	1100	33000	68000	110000	
Ethylbenzene	26	62	120	34	81	110	3200	7400	14000	
Xylenes (total)	28	67	130	33	78	110	3200	7700	15000	[12]
1,2,4-trimethylbenzene	0.22	0.53	1.1	0.24	0.58	1.2	39	93	170	
Iso-propylbenzene	6.6	16	32	6.8	17	33	1300	3100	6100	
Propylbenzene	21	51	100	23	57	110	3800	9100	17000	
Styrene	6.9	16	32	21	49	93	3100	6100	9500	
TPH										
Aliphatic EC 5-6	24	41	68	24	41	48	2400	4100	6900	
Aliphatic EC >6-8	53	110	210	53	110	150	5300	11000	21000	
Aliphatic EC >8-10	13	31	61	13	31	43	1300	3100	6000	
Aliphatic EC >10-12	62	150	300	62	150	220	6100	15000	28000	
Aliphatic EC >12-16	510	1200	2300	510	1200	1700	43000	72000	85000	
Aliphatic EC >16-35	41000	70000	90000	42000	70000	80000	>1E6	>1E6	>1E6	[13]
Aromatic EC >5-7	53	110	200	150	300	380	15000	28000	48000	
Aromatic EC >7-8	100	240	460	370	820	1100	33000	68000	110000	
Aromatic EC >8-10	20	48	94	22	54	75	2200	5200	9800	
Aromatic EC >10-12	63	150	290	120	290	400	11000	22000	30000	
Aromatic EC >12-16	140	320	570	1100	1900	2100	35000	37000	37000	
Aromatic EC >16-21	260	540	840	1800	1900	1900	28000	28000	28000	
Aromatic EC >21-35	1100	1500	1700	1900	1900	1900	28000	28000	28000	
Chlorinated Organics										
Chlorobenzene	0.19	0.44	0.86	0.19	0.45	0.87	31	71	140	
Dichloromethane (DCM)	0.47	0.78	1.2	1.2	1.7	2.4	250	340	470	
1,1-dichloroethane (DCA)	1.4	2.4	4.0	1.4	2.4	4.1	260	420	690	
1,2-dichloroethane (DCA)	0.0031	0.0048	0.0076	0.0035	0.0053	0.0084	0.34	0.51	0.81	
1,1-dichloroethene (DCE)	0.15	0.26	0.45	0.15	0.26	0.46	24	43	74	
cis -1,2-dichloroethene (DCE)	0.066	0.12	0.20	0.069	0.12	0.21	14	23	38	
trans -1,2-dichloroethene (DCE)	0.11	0.21	0.38	0.12	0.22	0.39	21	37	65	
Pentachlorophenol	0.21	0.52	1.0	27	30	31	400	400	400	
1,1,1,2-tetrachloroethane	0.56	1.3	2.6	0.63	1.5	2.9	59	140	270	
1,1,2,2-tetrachloroethane	0.98	2.1	4.0	1.6	3.4	6.3	150	310	570	

The Sirius Group
Stage 1 Generic Assessment Criteria for Soils

Parameter	Residential (mg/kg, unless otherwise stated)						Commercial / Industrial (mg/kg, unless otherwise stated)			Note
	With Homegrown Produce			Without Homegrown Produce						
	1% SOM	2.5% SOM	5% SOM	1% SOM	2.5% SOM	5% SOM	1% SOM	2.5% SOM	5% SOM	
Tetrachloroethene (PCE)	0.074	0.17	0.32	0.07	0.17	0.33	10	23	45	
Tetrachloromethane (CT)	0.011	0.024	0.046	0.011	0.024	0.046	1.6	3.6	6.9	
1,1,1-trichloroethane (TCA)	3.7	7.8	15	3.8	7.9	15	370	770	1400	
1,1,2-trichloroethane (TCA)	0.39	0.85	1.6	0.51	1.1	2.0	89	180	320	
Trichloroethene (TCE)	0.0070	0.015	0.028	0.0071	0.015	0.68	1.5	2.8	44	
Trichloromethane (CF)	0.43	0.80	1.4	0.48	0.89	53	98	170	300	
Vinyl Chloride	0.00034	0.00045	0.00062	0.00037	0.00048	0.00066	0.038	0.049	0.068	
Miscellaneous Organics										
Carbon disulphide	0.066	0.13	0.25	0.066	0.13	0.25	6.7	14	25	
Di-(2-ethylhexyl)-phthalate	290	660	1100	3900	4000	4100	85000	85000	8600	
MTBE	31	55	94	39	68	120	7400	12000	19000	
Phenol	110	190	330	420	440	440	440			[14]
Methylphenols (cresols), total	78	170	330	5600	8200	9900	160000	170000	18000	[15]
2,4-dimethylphenol (m-xylenol)	18	43	82	200	430	720	15000	23000	28000	
Other Parameters										
TOC	3% w/w			3% w/w			3% w/w			[16]
Calorific Value	2 MJ/kg			2 MJ/kg			2 MJ/kg			[17]
Asbestos	Fibres present			Fibres present			Fibres present			

All concentration-based criteria are rounded to 2 significant figures.

The criteria assume a sandy soil type, which will be conservative for the great majority of soils (including made ground) encountered on historically contaminated sites.

Except where otherwise stated, criteria have been derived by Sirius using CLEA version 1.06. Parameters for the land use cases are consistent with those given in Environment Agency (2009) "Updated Technical Background to the CLEA Model", report SC050021/SR3 but updated (where relevant) for respiration rate, exposure frequency for dermal contact outdoors, soil adherence factors for children, and plant uptake concentration factors given in CL:AIRE (2014) and Nathanail et al., (2015). No correction has been made for the "Top Two" crop types in the Residential with Homegrown Produce land use and the criteria will therefore be conservative in this regard.

Health Criteria Values (HCVs) and (except where specifically noted) chemical property data were obtained from:
- Environment Agency Science Report SC050021 Series;
- Nathanail et al. (2015);
- CL:AIRE-AGS-EIC (2010).

Footnotes

[1] Based on oral GAC as this is the lower GAC and reflects a cancer risk many orders of magnitude greater than for inhalation.

[2] Determined for lifetime exposure. Plant uptake concentration factors applied were as given in CL:AIRE (2014). The GAC values are based on data for soils having a pH value in the range 6-8; caution should be applied in applying them at pH values outside this range, especially at pH values <5.

[3] Both oral and inhalation HCVs are based on local toxicological effects and therefore the lowest (oral) GAC value is adopted.

[4] For the Residential with Homegrown Produce land use, the GAC values for Cu and Zn are based on potential phytotoxic effects and have been set at the maximum allowable concentrations for sewage sludge-amended soils presented in the "Sludge (Use in Agriculture) Regulations" (SI 1263/1989); these criteria may also be applied in any land use where plants are to be grown. The equivalent GAC values for human health protection in the Residential with Homegrown Produce land use are around an order of magnitude greater.

[5] The Category 4 Screening Levels for lead defined in CL:AIRE (2013) have been adopted directly to provide an acceptable basis for initial assessment of data. Where background concentrations of lead exceed the GAC value, then site-specific evaluation will be required.

[6] The SGV for mercury is based on inorganic mercury which represents the most common form encountered within the environment. This is considered appropriate for most sites as: "…the SGV for inorganic mercury can normally be compared with chemical analysis for total mercury content because the equilibrium concentrations of elemental and methylmercury compounds are likely to be very low" (Environment Agency report SC050021/Mercury SGV). Analysis and specific assessment for elemental or methylated forms of mercury will need to be considered if historical land use or site-specific factors indicate that these forms of mercury are likely to be present.

[7] Toxicological effects by inhalation are localised, therefore the lower of the GAC values for oral and inhalation HCVs have been adopted.

[8] BRE (2005). Sulphate is not considered to pose a potential risk to human health under normal circumstances – this GAC applies to construction cases only and is set at the upper limit for DS-1 Design Sulphate Class concrete.

[9] GAC calculated for acute risk. Further information can be provided upon request.

[10] The genotoxic PAHs (benz(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(g,h,i)perylene, chrysene, dibenz(a,h)anthracene, indeno(1,2,3-c,d)pyrene) are routinely assessed using benzo(a)pyrene as a surrogate (HPA (2010) "Risk Assessment Approaches for Polycyclic Aromatic Hydrocarbons (PAHs)", version 5). Separate information on this approach is provided.

[11] Calculated using a 'minimum risk' oral index dose derived from the application of a 10,000x safety factor to the BMD10 presented in CL:AIRE (2014) for benzo(a)pyrene as a surrogate marker and the inhalation index dose specified in CL:ARE (2014) and Nathanail *et al*. (2015). As a conservative measure, the GAC is based on combined exposure pathways to account for systemic carcinogenic effects. Further information on the derivation can be provided upon request.

[12] For screening purposes, a single GAC has been set for total xylene. This is the lowest of the values calculated for the three individual xylene isomers.

[13] "No GAC" indicates that no value has been specified for this land use as the TDSI cannot be exceeded at achievable soil concentrations.

[14] 440mg/kg is the minimum concentration that is protective for direct skin contact with phenol (See Environment Agency SR050021/Phenol SGV) and is adopted where GACs for chronic exposure are higher.

[15] For screening purposes, a single GAC has been set for total methylphenol. This is the lowest of the values calculated for the three individual methylphenol isomers.

[16] The Hazardous Waste (England and Wales) Regulations 2005. TOC content in itself does not represent a potential risk to human health. This GAC is provided for indicative assessment of disposal options, in the case that off-site landfill of soil is undertaken. This GAC is specified at the 'Inert' waste threshold and should be considered as for information purposes only.

[17] ICRCL (1986) Guidance Note 61/84, 2nd Edition, Notes on the Fire Hazards of Contaminated Land. Calorific value is not an indication of direct human health risk but may be useful in assessment of the potential fire risk posed by made ground or natural soils containing elevated concentrations of potentially combustible organic matter.

The Sirius Group
Stage 1 Generic Assessment Criteria for Soils in Public Open Space Settings

Revision: 20th August 2015

Parameter	Informal POS in Residential Setting (mg/kg, unless otherwise stated)			Park POS (mg/kg, unless otherwise stated)			Note
	1% SOM	2.5% SOM	5% SOM	1% SOM	2.5% SOM	5% SOM	
Metals/Metalloids							
Arsenic (inorganic)	79			170			[1]
Cadmium	120			560			[2]
Chromium (III)	1500			33000			
Chromium (VI)	7.7			220			[3]
Copper	200			200			[4]
Lead	630			1300			[5]
Mercury (inorganic)	120			240			[6]
Nickel	230			800			[7]
Selenium	1100			1800			
Vanadium	2000			5000			
Zinc	450			450			[4]
Other Inorganics							
pH	<5 or >9			<5 or >9			
Total Sulphate	2400			2400			[8]
Water-Soluble Sulphate	0.5 g/l			0.5 g/l			[8]
Free Cyanide	34			34			[9]
Organics							
PAHs							
Acenaphthene	15000	15000	15000	30000	30000	30000	
Acenaphthylene	15000	15000	15000	30000	30000	30000	
Anthracene	74000	74000	74000	150000	150000	150000	[10]
Benzo(a)anthracene	Assessed using benzo(a)pyrene as a surrogate marker						[10]
Benzo(a)pyrene	4.2	4.2	4.2	10	10	10	[11]
Benzo(b)fluoranthene	Assessed using benzo(a)pyrene as a surrogate marker						[10]
Benzo(k)fluoranthene	Assessed using benzo(a)pyrene as a surrogate marker						[10]
Benzo(g,h,i)perylene	Assessed using benzo(a)pyrene as a surrogate marker						[10]
Chrysene	Assessed using benzo(a)pyrene as a surrogate marker						[10]
Dibenzo(a,h)anthracene	Assessed using benzo(a)pyrene as a surrogate marker						[10]
Fluoranthene	3100	3100	3100	6300	6300	6400	
Fluorene	9900	9900	9900	20000	20000	20000	
Indeno(1,2,3-c,d)pyrene	Assessed using benzo(a)pyrene as a surrogate marker						[10]
Naphthalene	3500	3800	4000	1300	1800	2400	
Phenanthrene	3100	3100	3100	6300	6300	6300	
Pyrene	7400	7400	7400	15000	15000	15000	
BTEX and related							
Benzene	71	72	72	94	100	110	
Toluene	55000	56000	56000	90000	97000	100000	
Ethylbenzene	23000	24000	24000	18000	23000	28000	
Xylenes (total)	38000	40000	41000	19000	26000	33000	[12]
1,2,4-trimethylbenzene	240	240	240	220	280	320	
Iso-propylbenzene	24000	24000	24000	14000	20000	24000	
Propylbenzene	24000	24000	25000	27000	33000	37000	
Styrene	3000	3000	3000	5600	5800	5900	
TPH							
Aliphatic EC 5-6	520000	550000	570000	120000	150000	200000	
Aliphatic EC >6-8	560000	580000	600000	170000	250000	330000	
Aliphatic EC >8-10	12000	12000	12000	16000	19000	22000	
Aliphatic EC >10-12	13000	13000	13000	22000	24000	24000	
Aliphatic EC >12-16	13000	13000	13000	25000	25000	26000	
Aliphatic EC >16-35	250000	250000	250000	470000	480000	490000	
Aromatic EC >5-7	55000	55000	55000	78000	87000	93000	
Aromatic EC >7-8	55000	55000	55000	89000	97000	100000	
Aromatic EC >8-10	5000	5000	5000	7700	8800	9300	
Aromatic EC >10-12	5000	5000	5000	9400	9800	10000	
Aromatic EC >12-16	5000	5000	5000	10000	10000	10000	
Aromatic EC >16-21	3800	3800	3800	7700	7800	7800	
Aromatic EC >21-35	3800	3800	3800	7800	7900	7900	
Chlorinated Organics							
Chlorobenzene	8800	10000	12000	1500	2200	3000	
Dichloromethane (DCM)	750	750	750	1400	1400	1400	
1,1-dichloroethane (DCA)	42000	43000	45000	11000	14000	17000	
1,2-dichloroethane (DCA)	28	28	28	22	25	28	
1,1-dichloroethene (DCE)	9200	9600	10000	1900	2500	3200	
cis-1,2-dichloroethene (DCE)	1200	1200	1300	390	490	610	
trans-1,2-dichloroethene (DCE)	3500	3700	3800	910	1200	1500	
Pentachlorophenol	180	180	180	250	270	280	
1,1,1,2-tetrachloroethane	1400	1400	1400	1600	1900	2100	
1,1,2,2-tetrachloroethane	1400	1400	1400	1900	2100	2300	
Tetrachloroethene (PCE)	1300	1400	1400	900	1200	1500	
Tetrachloromethane (CT)	790	850	890	210	310	410	
1,1,1-trichloroethane (TCA)	120000	130000	130000	63000	84000	100000	

The Sirius Group
Stage 1 Generic Assessment Criteria for Soils in Public Open Space Settings

Parameter	Informal POS in Residential Setting (mg/kg, unless otherwise stated)			Park POS (mg/kg, unless otherwise stated)			Note
	1% SOM	2.5% SOM	5% SOM	1% SOM	2.5% SOM	5% SOM	
1,1,2-trichloroethane (TCA)	960	970	980	760	950	1100	
Trichloroethene (TCE)	110	120	120	76	98	120	
Trichloromethane (CF)	2400	2500	2500	2700	2900	3100	
Vinyl Chloride	3.5	3.5	3.5	5.0	5.2	5.5	
Miscellaneous Organics							
Carbon disulphide	9000	10000	11000	1500	2100	2800	
Di-(2-ethylhexyl)-phthalate	9700	9700	9700	16000	16000	16000	
MTBE	73000	73000	73000	70000	81000	92000	
Phenol	440			440			[13]
Methylphenols (cresols), total	25000	25000	25000	47000	49000	50000	[14]
2,4-dimethylphenol (m-xylenol)	5000	5000	5000	8700	9200	9600	
Other Parameters							
TOC	3% w/w			3% w/w			[15]
Calorific Value	2 MJ/kg			2 MJ/kg			[16]
Asbestos	Fibres present			Fibres present			

The POS cases defined are based on the specific Conceptual Site Models given in CL:AIRE (2014). For these GACs to be applied, the relevant conceptual model must be valid for the site under assessment.

All concentration-based criteria are rounded to 2 significant figures.

The criteria assume a sandy soil type, which will be conservative for the great majority of soils (including made ground) encountered on historically contaminated sites.

Except where otherwise stated, criteria have been derived by Sirius using CLEA version 1.06. Parameters for the land use cases are consistent with those given in Environment Agency (2009) "Updated Technical Background to the CLEA Model", report SC050021/SR3 but updated (where relevant) for respiration rate, exposure frequency for dermal contact outdoors, soil adherence factors for children, and plant uptake concentration factors given in CL:AIRE (2014) and Nathanail et al. (2015). No correction has been made for the "Top Two" crop types in the Residential with Homegrown Produce land use and the criteria will therefore be conservative in this regard.

Health Criteria Values (HCVs) and (except where specifically noted) chemical property data were obtained from:
- Environment Agency Science Report SC050021 Series;
- Nathanail et al. (2015);
- CL:AIRE, ASC TR3 (2013).

Footnotes

[1] Based on oral GAC as this is the lower GAC and reflects a cancer risk many orders of magnitude greater than for inhalation.

[2] Determined for lifetime exposure. Plant uptake concentration factors applied were as given in CL:AIRE (2014). The GAC values are based on data for soils having a pH value in the range 6-8; caution should be applied in applying them at pH values outside this range, especially at pH values <5.

[3] Both oral and inhalation HCVs are based on local toxicological effects and therefore the lowest (oral) GAC value is adopted.

[4] The GAC values for Cu and Zn are based on potential phytotoxic effects and have been set at the maximum allowable concentrations for sewage sludge-amended soils presented in the "Sludge (Use in Agriculture) Regulations" (SI 1263/1989); these criteria may also be applied in any land use where plants are to be grown. The GAC values for human health protection are significantly higher.

[5] The Category 4 Screening Levels for lead defined in CL:AIRE (2014) have been adopted directly to provide an acceptable basis for initial assessment of data. Where background concentrations of lead exceed the GAC value, then site-specific evaluation will be required.

[6] The SGV for mercury is based on inorganic mercury which represents the most common form encountered within the environment. This is considered appropriate for most sites as: "…the SGV for inorganic mercury can normally be compared with chemical analysis for total mercury content because the equilibrium concentrations of elemental and methylmercury compounds are likely to be very low" (Environment Agency report SC050021/Mercury SGV). Analysis and specific assessment for elemental or methylated forms of mercury will need to be considered if historical land use or site-specific factors indicate that these forms of mercury are likely to be present.

[7] Toxicological effects by inhalation are localised; consistent with the SGV for nickel, the lower of the GAC values for oral and inhalation HCVs have been adopted in each case.

[8] BRE (2005). Sulphate is not considered to pose a potential risk to human health under normal circumstances – this GAC applies to cases where concrete structures may be constructed within the soil and is set at the upper limit for DS-1 Design Sulphate Class concrete.

[9] GAC calculated for acute risk. Further information can be provided upon request.

[10] The genotoxic PAHs (benz(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(g,h,i)perylene, chrysene, dibenz(a,h)anthracene, indeno(1,2,3-c,d)pyrene) are routinely assessed using benzo(a)pyrene as a surrogate (HPA (2010) "Risk Assessment Approaches for Polycyclic Aromatic Hydrocarbons (PAHs)", version 5). Separate information on this approach is provided.

[11] Calculated using a 'minimum risk' oral index dose derived from the application of a 10,000x safety factor to the BMD10 presented in CL:AIRE (2014) for benzo(a)pyrene as a surrogate marker and the inhalation index dose specified in CL:ARE (2014) and Nathanail et al. (2015). As a conservative measure, the GAC is based on combined exposure pathways to account for systemic carcinogenic effects. Further information on the derivation can be provided upon request.

[12] For screening purposes, a single GAC has been set for total xylene. This is the lowest of the values calculated for the three individual xylene isomers.

[13] 440mg/kg is the minimum concentration that is protective for direct skin contact with phenol (See Environment Agency SR050021/Phenol SGV) and is adopted where GACs for chronic exposure are higher.

[14] For screening purposes, a single GAC has been set for total methylphenol. This is the lowest of the values calculated for the three individual methylphenol isomers.

[15] The Hazardous Waste (England and Wales) Regulations 2005. TOC content in itself does not represent a potential risk to human health. This GAC is provided for indicative assessment of disposal options, in the case that off-site landfill of soil is undertaken. This GAC is specified at the 'Inert' waste threshold and should be considered as for information purposes only.

[16] ICRCL (1986) Guidance Note 61/84, 2nd Edition, Notes on the Fire Hazards of Contaminated Land. Calorific value is not an indication of direct human health risk but may be useful in assessment of the potential fire risk posed by made ground or natural soils containing elevated concentrations of potentially combustible organic matter.

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