

LAND OFF POVERTY LANE, MAGHULL

Phase I Geo-Environmental Assessment

Persimmon Homes (Lancashire) Limited *and* Countryside
Properties (UK) Limited

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Incorporating

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PHASE I GEO-ENVIRONMENTAL ASSESSMENT

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This report dated 13 March 2017 has been prepared jointly for Persimmon Homes (Lancashire) Ltd and Countryside Properties (UK) Ltd (the "Client") in accordance with the terms and conditions of appointment dated 09 February 2017 (the "Appointment") between the Client and **Arcadis (UK) Limited** ("Arcadis") for the purposes specified in the Appointment. For avoidance of doubt, no other person(s) may use or rely upon this report or its contents, and Arcadis accepts no responsibility for any such use or reliance thereon by any other third party.

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Study Limitations

1 Introduction

1.1 Appointment

Arcadis (UK) Limited (Arcadis) was commissioned jointly by Persimmon Homes (Lancashire) Limited and Countryside Properties (UK) Limited (together, the Client) to complete a Phase I Geo-Environmental Assessment for Land off Poverty Lane, Maghull, Liverpool (the Site).

A Site location plan is presented in Appendix A.

1.2 Objectives & Scope of Work

It is understood that the Site is under consideration for redevelopment for a residential end use. The objective of this assessment was to investigate, collate and review the environmental information for the Site to determine any risks/liabilities associated with potential ground contamination.

To achieve the objective the following scope of work was defined:

- Carry out a walkover survey of the Site including photographs (Appendix B).
- Review all published and readily available information concerning the Site, including:
 - Recent Ordnance Survey (OS) Map;
 - Site-specific Groundsure Report (Appendix C);
 - Historical Ordnance Survey maps (Appendix C);
 - BRE Radon Atlas for England;
 - British Geological Survey (BGS) published maps and relevant archive borehole records (Appendix D); and,
 - The Environment Agency (EA) website.
- Assessment of on-site/off-site potentially contaminative issues;
- Develop a Conceptual Site Model and prepare a Preliminary Risk Assessment; and
- Provide a preliminary Geotechnical Appraisal.

1.3 Reliability of Information / Limitations

Arcadis warrants that the services performed were conducted in a competent and professional manner in accordance with sound consulting practices and procedures.

Arcadis cannot warrant the actual property conditions described in this report beyond matters amenable to confirmation within the limits of this report.

The reader is referred to the Study Limitations, presented in Appendix E.

2 Site Setting

2.1 Site Location

The centre of the Site is located at National Grid Reference: 339140, 401957. The Site elevation ranges from approximately 19m Above Ordnance Datum (AOD) in the southwest to 26m AOD in the northeast.

A Site Location Plan and a Site Layout Plan are presented in Appendix A.

2.2 Site Description

The Site area is approximately 86ha and consists primarily of arable farmland partitioned into a number of fields by hedgerows and drainage ditches. The following on-site features have been identified and confirmed during a site reconnaissance visit conducted on 27th February 2017 by Mr Ben Le Grice of Arcadis:

- Four farm building complexes:
 - Ashworth Farm located on the northern edge of the site, comprising a farm house, a number of derelict sheds, glass houses and out-buildings, a large tank (of unknown use; possibly a water tank), a substation and a large chimney anticipated to have been associated with heating for the now derelict glass houses;
 - Bridge Farm located in the north-western corner of the site, comprising a farm house, barns, an electrical transformer, and offices for a pallet distribution business. A number of barns appear to be used for storage associated with the pallet distribution business. Forklift trucks and HGVs were noted on the premises;
 - Bradley's Farm located in the northeast of the Site, comprising a farm house and barns, some derelict; and,
 - Summerhill Farm located on the southern site boundary, comprising a farm house and barns.
- An access bridge and associated embankment crossing the M58 motorway connecting the Site with Moss Nook Farm, located to the southeast of the Site;
- A footpath running southeast across the site from Bridge Farm to Moss Nook Farm;
- A footpath running northwest from Moss Nook Farm, along the south-eastern Site boundary to Poverty Lane;
- A mobile telephone mast located close to the south-eastern boundary at the intersection of the two footpaths; and,
- Whinney Brook, originating at the northern boundary on School Lane, flowing to the south along the eastern boundary of Ashworth Farm and then southwest across the site, exiting the site on the northwest boundary.

In addition, recent OS maps identify three unnamed ponds at the Site. It was not possible to verify the position or state of these features during the Site walkover due to their positions away from public paths.

2.3 Surrounding Land-use

The current land uses surrounding the Site are described below:

North: Immediately north is School Lane, with predominantly residential properties beyond;

East: Immediately east is the M58 motorway, with farmland beyond;

South: Immediately south is Poverty Lane, with residential properties, and Summer Hill Primary School and Nursery beyond.

West: Immediately west is an active railway line, with residential properties beyond.

3 Environmental Setting

3.1 Geology

3.1.1 Regional Geology – Published Sources

The regional geological information pertaining to the Site was gained from a review of the BGS 1:50,000 scale maps (no. 83 Formby, solid and drift editions, and no. 84 Wigan, solid and drift editions). This was supplemented with archive borehole records available through the BGS GeoIndex website (copies in Appendix D).

Formation	Published Information	Borehole Record Information
Made Ground & Topsoil/Tilled Soil	The available BGS mapping does not show the presence of Made Ground underlying the Site, however Made Ground may be present in developed areas of the site.	Borehole record SD30SE8 located in the centre of the Site records a unit named 'soil' (presumably tilled soil) to a depth of approximately 0.5m below ground level (bgl). Borehole record SD30SE29 located in the northwest of the Site records 'soil' to a depth of approximately 0.6m below ground level (bgl). No other indication of Made Ground is given within available on-site borehole records.
Superficial Geology	The majority of the Site is underlain by the Shirdley Hill Sand of Quaternary age, described as fine grained aeolian (wind blown) sands with peat layers present towards the base. This is underlain by Glacial Till of Quaternary age, comprising clay, sand and gravel. The northwest corner of the Site is underlain directly by the older Glacial Till deposits.	Borehole record SD30SE8 located in the centre of the Site records sand to approximately 0.9m bgl, underlain by clay to approximately 11.6 m bgl followed by a sand layer to approximately 12.5m bgl. Borehole record SD30SE29 located in the northwest of the Site records black and white sand to approximately 1.5m bgl, underlain by predominantly clay to approximately 8.8m bgl. This is followed by sand and gravel to approximately 13.5m bgl. Superficial deposits have been classified as Glacial Till and Glacial Outwash. Borehole record SD30SE100, located on the south-eastern site boundary indicates superficial geology to comprise Glacial Till to a depth of 14.5m bgl. This log also provides cohesion values which indicate Stiff soils to 2m bgl underlain by Firm soils to 7m bgl in turn underlain by Very Stiff soils.
Bedrock Geology	Bedrock geology is recorded to be the Sherwood Sandstone Group, deposited in the Permian and Triassic periods, and comprising Sandstones with subordinate siltstone and mudstone.	Borehole record SD30SE8 located in the centre of the Site records bedrock at approximately 12.5m bgl and is proven to approximately 12.3m bgl. Borehole record SD30SE29 located in the northwest of the Site records bedrock, interpreted as Bunter Sandstone to be present from approximately 13.5m bgl. The unit is proven to a depth of approximately 15m bgl. Borehole record SD30SE100, located on the south-eastern site boundary records weathered

		red sandstone to be present from 14.5m bgl. The unit is proven to a depth of 16.3m bgl.
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3.1.2 Coal Mining Affected Areas

Review of the Groundsure report and Coal Authority website (accessed 27th February 2017) indicates that the Site is not located in an area potentially affected by coal mining, i.e. there are no coal mining areas located within 1km of the Site.

3.2 Hydrogeology

3.2.1 Hydrogeology and Groundwater Vulnerability

Review of the EA's online mapping tool indicates that the Superficial Shirdley Hill Sand deposits beneath the Site are designated as a Secondary (A) Aquifer, while the bedrock Sherwood Sandstone Group is classified as a Principal Aquifer. Whilst only the uppermost drift unit is mapped on the Aquifers map, the Glacial Till is generally designated as either Unproductive Strata or Secondary (Undifferentiated) Aquifer.

Principal Aquifers are described as layers of rock or drift deposits that have high intergranular and/or fracture permeability, meaning they usually provide a high level of water storage and are of local and/or regional importance. They may support water supply and/or river base flow on a strategic scale. Secondary (A) Aquifers are permeable layers capable of supporting water supplies at a local rather than a strategic scale, and in some cases forming an important source of base flow to rivers. Unproductive Strata are drift deposits with low permeability that have negligible significance for water supply or river base flow.

The Hydrogeological Map of Clwyd and Cheshire Basin (Sheet 19) infers a general groundwater flow direction to the northwest in the bedrock sandstone, with groundwater anticipated at approximately 8m AOD (i.e. ~12m bgl). A site-specific depth to water was not recorded within the available BGS borehole logs in either the superficial or bedrock deposits.

3.2.2 Groundwater Abstraction and SPZs

The Groundsure report (Appendix C) indicates that there are no active groundwater abstraction licences in place at the Site.

There are two active groundwater abstraction licences in place within 2km of the site, both for potable water abstractions. The nearest is located approximately 520m southeast of the site and is licenced to United Utilities Water Limited for direct public potable water supply.

The Groundsure Report and the EA website indicate the Site is located within a Groundwater Source Protection Zone (SPZ). The site is within SPZ 3 (Total Catchment area) related to the aforementioned potable water abstraction licenced to United Utilities Water Ltd.

3.3 Hydrology

3.3.1 Surface Water Features

The following water features have been identified at the Site:

- Whinney Brook, originating at the northern boundary on School Lane, flowing to the south along the eastern boundary of Ashworth Farm and then southwest across the site, exiting the site on the northwest boundary.
- The site is divided by a number of unnamed drainage ditches:
 - A ditch is marked starting at Ashworth Farm, and flowing northwest to southeast into Whinney Brook in the centre of the site;
 - A ditch located to the north of Bridge Farm, flowing northwest to southeast across and out of the site via a culvert under the M58 motorway. The ditch then turns to the southwest, picks up water from off-site drainage, and turns again to re-enter the site on the southeast boundary via another culvert. The ditch flows into Whinney Brook in the centre of the Site;

- A ditch marked as beginning to the northeast of Moss Nook Farm (off-site) and flowing southeast to northwest onto the Site and into Whinney Brook;
- A ditch marked as beginning by the mobile telephone mast in the southeast of the Site, flowing to the southwest before turning 90 degrees and exiting the site via a culvert on the south-eastern boundary.
- Publicly available aerial imagery and maps identify three unnamed ponds at the Site. It was not possible to verify the position of these features during the Site walkover.

The following surface water features were identified within 500m of the site:

- Leeds and Liverpool Canal located approximately 500m southwest of the Site, running northwest to southeast;
- Drainage ditches:
 - Located on the south-eastern site boundary flowing northwest onto site towards Whinney Brook;
 - Approximately 98m southwest, with ponds;
 - Approximately 128m to the northeast, with ponds;
 - Approximately 185m northeast;
 - Approximately 280m southeast of the site flowing to the southeast;
 - Approximately 340m northeast;
 - Approximately 364m north.
 - Approximately 417m east; and,
 - Approximately 485m northeast;
- Ponds:
 - Approximately 300m northeast;
 - Approximately 388m north;
 - Approximately 417m east; and,
 - Approximately 435m southeast.

3.3.2 Surface Water Abstractions

Three active surface water abstraction licences are recorded within 2km of the Site. The nearest abstraction is listed as being for the purpose of transfer between sources and is located approximately 1.5km north of the Site at Sudell Brook, Aughton.

3.3.3 Flooding

A review of data supplied within the Groundsure report indicates that the area surrounding Whinney Brook is classified as being at high risk of flooding from rivers or sea (Flood Zone 3; greater than 1 in 30 chance). The remainder of the site is classified as having a very low risk of flooding from rivers or sea (being in Flood Zone 1; less than 1 in 1000 chance). It is understood that a Flood Risk Assessment is being undertaken by others.

3.3.4 Discharge Consents

According to the Groundsure Report, there are no discharge consents relating to the Site.

There is one discharge consent listed within 500m of the Site, relating to discharge of final/treated effluent from sewage at Moss Nook Cottages (private), located approximately 390m southeast of the Site. Whilst the receiving watercourse is stated to be Whinney Brook, due to the presence of field drains both to the north and south of the cottages, it is unclear whether this discharge is to drainage ditches which connect into the watercourses on site or those which flow around it to the south.

3.3.5 Pollution Incidents to Controlled Water

The Groundsure Report contains no records of pollution incidents to controlled water within a 500m radius of the Site.

3.4 Landfills and Waste Management Activities

Information supplied by Groundsure and by the EA website indicates that there is one historical landfill within 1km of the Site. Rock Lane Tip is located approximately 730m southwest of the Site. Waste was received between August 1986 and December 1987. It is understood that the tip received Inert waste. Given the landfill's distance from the Site, it is considered unlikely that this landfill could have significantly affected the Site.

3.5 Industrial Land-use

There are no records of Part A(1) Environmental Permits (formerly Integrated Pollution Prevention and Control (IPPC) permits), Part A(2) Environmental Permits, or COMAH sites within 500m of the Site.

There is one record of a Part B Permit within 500m of the Site, issued for dry cleaning processes and located approximately 350m southwest of the Site. The permit is listed as having been revoked.

A review of the Groundsure report indicates one potentially contaminative industrial activity within 250m of the Site. A civil engineering firm is present approximately 160m to the northwest of the Site.

In addition, a sewage pumping station is present approximately 13m north of the Site.

The Groundsure report lists one electricity substation as being present on-site, positioned on the northern site boundary. A further nine substations are listed within 250m of the site.

The following potentially contaminative land uses were identified on-site during the site walkover:

- Four farms and associated buildings;
- A pallet distribution warehouse, located at Bridge Farm;
- Transformers and electrical junctions associated with the mobile telephone mast on the south-eastern edge of the Site;
- Transformers and electrical junctions associated with Bridge Farm and Ashworth Farm; and,
- A historical chimney and tank associated with Ashworth Farm.

3.6 Invasive Plants & Protected Habitats/Species

During the site walkover, no invasive plants / protected species were observed.

With respect to the specific definition of Contaminated Land, the Site does not lie within 500m of one of the following statutory sensitive sites: Site of Special Scientific Interest (SSSI), National Nature Reserve, Marine Nature Reserve, Ramsar Site, Special Area of Conservation, Special Protection Area or World Heritage Site.

3.7 Unexploded Ordnance (UXO) Screening Assessment

Assessment of regional UXO maps indicates that the Site is within a high bomb risk region. Further assessment may be considered necessary to clarify the nature and extent of potential UXO issues, particularly if and when any redevelopment is being considered.

4 SITE HISTORY

4.1 Site History

Based on historical maps in the Groundsure Report (presented in Appendix C) the Site history is summarised below:

Aspect	Map Dates	Comments
Railway line	1850-Present	The Liverpool, Blackburn and Accrington Railway Line runs along the north-western site boundary.
Farmland and farm drainage	1850-Present	The Site is occupied by farmland, divided by hedgerows and drainage ditches. These are progressively removed and infilled over time to make larger fields.
Ponds	1850-Present	A number of ponds are noted to be present across the site. Ponds are progressively infilled over time. By 2014, only three remain on the site. The majority of infilling appears to have occurred between 1850 and 1892.
Farm Buildings	Bradley's Farm 1850-Present	No changes to Bradley's Farm are noted on the available historical maps. A well is marked on maps dating from 1908.
	Summerhill Farm 1914-Present	An extension to Summerhill farm is present on maps dating from 2002.
	Ashworth Farm 1907-Present	Buildings present on-site in 1907 are marked as 'The Poplars' Additional buildings have been constructed by 1926, and further structures by 1974. Publicly available aerial imagery shows Ashworth Farm to be in disrepair by 2002.
	Bridge Farm 1962-Present	The farm is extended and first named on maps dating from 1974. Publicly available aerial imagery indicates that additional barns/warehouses have been built between 2000 and 2005. These appear to be related to use of the farm for pallet distribution.
Motorway	1987-Present	The M58 motorway has been built by 1987 and runs along the south-eastern site boundary. Embankments at the interchanges with Poverty Lane and School Lane were built at the same time.
Mobile Telephone Mast	2000-Present	Access routes to the mast location have been built by 1987, however the mast first appears in publicly available aerial imagery from 2000.
Substation	1987-Present	A substation is located on the northern site boundary by Ashworth Farm.
Access Bridge	1988-Present	An embankment and access bridge connecting the site with Moss Nook Lane has been built by 1988.

4.2 History of the Surrounding Area

Based on historical maps in the Groundsure Report (presented as Appendix C) the history of the area surrounding the Site (with respect to potential contaminative activities) is summarised below:

Aspect	Map Dates	Location	Comments
Canal	1850-Present	500m South	The Leeds and Liverpool canal is located to the south of the Site.
Railway Station	1950-Present	250m Southwest	Maghull Station is positioned to the southwest of the site, on the Liverpool, Blackburn and Accrington Line. Railway sidings are present at the station on maps dating from 1893-1939.
Farmland and farm drainage	1950-Present	-	The area surrounding the site is occupied by farmland divided by hedgerows and drainage ditches. These are progressively removed and infilled over time to make larger fields. The area to the southeast of the site remains farmland to the present day.
Ponds	1950-Present	-	A number of ponds are noted to be present in the immediate vicinity of the Site. The ponds are noted to have been progressively infilled over time.
Farm Buildings	1850-Present	-	A number of farms are present in the vicinity of the Site. The majority of these farms are now inactive or have been replaced by housing.
Smithy	1892-1907	300m Northwest	A smithy is present to the northwest of the Site. The smithy no longer marked on maps after 1907, however the building remains until 1938.
Pumping Station	1907-Present	550m Southeast	Melling Pumping Station is present to the southeast of the Site.
Sanatorium	1926-1968	400m Northwest	Bootle Corporation Sanatorium is located to the northwest of the site. It has been replaced by fields / meadows by 1974.
Hospital	Ashworth Hospital South 1928-2002	50m North	Ashworth Hospital South (Formerly Moss Side Hospital) is present to the north of the Site. The area formerly contained a convalescent home from 1897. The area has been redeveloped as HMP Kennet by 2010.
	Ashworth Hospital East 1955-2014	300m North	Ashworth Hospital East has repurposed as the new location of HMP Kennet by 2014. A chimney is present on maps dating between 1961 and 1995.
	Ashworth Hospital North 1987-Present	500m North	Formerly known as Park Lane Hospital.

Aspect	Map Dates	Location	Comments
Prison	HMP Kennet 2010	50m North	The HMP Kennet site is demolished by 2014, and is currently under redevelopment as the Poppy Fields housing estate.
	New HMP Kennet 2014-Present	300m North	The new HMP Kennet is located on the former Ashworth Hospital East site.
Industrial Estate	1974-Present	500m Northwest	Maghull Smallholdings Industrial Estate is marked on maps from 1974 onwards. Buildings are present on the land from 1938, where the road is named as the Mill Bank Estate.
Chimney	1973	75m South	A chimney is present adjacent to the current location of Summerhill Primary School
Substations	1973-Present	35m West	-
	1970-1993	500m Northwest	
	1993	20m North	
Garage	1974-1987	450m Northeast	A garage is present to the northeast of the Site. According to publicly available imagery, the garage has been repurposed as a car sales forecourt and motorbike training facility by 2009. By 2016, the car sales forecourt has been replaced by a hand carwash.
	1970-1993	500m Northwest	A garage is present on Deyes Lane to the northwest of the Site. The garage building is noted on publicly available imagery dating from 2000. It is replaced by houses by 2003.

4.3 Summary

A review of current and historical OS maps of the Site indicates that the Site has been used as farmland from earliest available maps in 1850, with only Bradley's farm existing on-site at this time. Summerhill Farm and Ashworth farm were built in the early 1900s, and Bridge Farm in the 1960s-70s. Development of Bridge Farm as a pallet distribution warehouse occurred in the early 2000s. There has been progressive infilling of small water features over time. Major earthworks occurred on the south-eastern site boundary in the 1980s during the construction of the M58 motorway. Surrounding current and historical off-site industrial land uses have been identified including medical activities, railways, a smithy, and garage/automotive repair works. In addition, a historical chimney is marked 75m south of the Site. The nature of activities at this location is unknown.

5 Conceptual Site Model

5.1 Introduction

This section summarises the findings of this desk-based assessment and site reconnaissance in the form of an environmental conceptual site model (CSM).

The CSM provides a qualitative evaluation of potentially active “pollutant linkages” at the Site; these being plausible scenarios whereby a contamination source is connected to a possible receptor by one or more pathways:

- Potential sources of contamination: these include any actual or potentially contaminating materials and activities, located either on or in the vicinity of the Site;
- Potential pathways for contamination migration: these comprise the routes or mechanisms by which contaminants may migrate from the source to the receptor including environmental migration pathways and human health exposure pathways; and
- Potential receptors of contamination: these include present and/or future land users, ecological systems, water resources and property.

5.2 Contamination Sources

Based on the information reviewed in this report the following potential contamination sources have been identified in relation to on-Site and off-Site sources:

5.2.1 On-Site

On-site sources of potential contamination are summarised in the table below:

Potential On-Site sources	Primary Contaminants
Made Ground (including potentially infilled water features/ponds, and manmade embankments)	Metals (including heavy metals), asbestos, and bulk ground gas.
Potential alluvial deposits in the Whinney Brook flood plain, including organics.	Bulk ground gas.
Farm buildings: Chemical and fuel storage (including historical storage)	Hydrocarbons, Polycyclic Aromatic Hydrocarbons (PAHs), and agrochemical products. Asbestos within current and derelict buildings.
Pallet Distribution Warehouse: Chemical and fuel storage, leaks from vehicles	Hydrocarbons, PAHs.
Chimney and tank at Ashworth Farm	Hydrocarbons, PAHs.
Electrical Transformers	Metals, Polychlorinated Biphenols (PCBs).

5.2.2 Off-Site

Multiple potentially contaminative land uses have been identified in the vicinity of the Site, the most pertinent of which are:

- Impacts associated with the historical railway located on the north-western site boundary and sidings located 250m northwest;
- Made Ground on the south-eastern boundary of the Site associated with the construction of the M58 motorway;
- Impacts associated with medical activities at the adjacent current and historical hospitals, the nearest being 30m north of the site; and,
- Impacts associated with the historical chimney located 75m south of the Site.

The table below summarises the potential contaminants associated with these uses.

Potential Off-site Sources	Contaminants
Made Ground (including potentially infilled water features, and manmade embankments)	Metals, PAHs, asbestos, and ground gasses.
Railway and sidings	Metals, PAHs, and Hydrocarbons.
Hospitals	Hydrocarbons, Volatile Organic Compounds (VOC), and Semi Volatile Organic Compounds (SVOC), medical compounds.
Historical Chimney	Hydrocarbons, PAH.

5.3 Pathways

Potential migration pathways based on a low density residential end use are discussed below.

5.3.1 Airborne Migration Pathways

- A significant proportion of the Site is uncovered open space. As such, particulate inhalation due to dust generation is a potentially active pathway.
- Vapour inhalation pathways in relation to soil and groundwater are potentially active, assuming a low density residential end use for the Site.

5.3.2 Aqueous Migration Pathways

- Leaching of contaminants in the shallow soils is considered to be active at present owing to the uncovered/pervious nature of the majority of the Site.
- Lateral migration of impacts in relation to both on- and off-site sources is considered a potentially active pathway in relation to groundwater which may be present within the underlying Secondary and Principal aquifers. Utility corridors anticipated to be present in the vicinity of the four farms and the mobile telephone mast currently on-site may also provide preferential pathways for liquid contaminants or contaminated water. Notwithstanding, the significant thickness of predominantly cohesive Glacial Till (Unproductive Strata) will likely reduce the potential for vertical and lateral migration of potential impacts due to its reduced permeability (as supported by the number of surface drainage ditches on site which indicates infiltration and natural drainage is poor).
- Surface water features are present on-site and in close proximity to the site boundary, including ditches draining land to the northeast of the site and discharging into Whinney Brook on-site. As such migration of impacts through surface water features is considered a potentially active pathway.

5.3.3 Direct Contact Exposure Pathways

- The potential for exposure by direct contact with soil exists within gardens and public open spaces in a low density residential scenario. It is unknown whether groundwater is present in the shallow superficial deposits and therefore direct contact pathways in relation to groundwater must be considered active at this stage. Currently there is an active direct contact pathway with surface water owing to presence of Whinney Brook on-site.
- Direct contact pathways would be active throughout site redevelopment activities, however typical mitigation measures such as personal protective equipment (overalls, gloves etc.) may be used to mitigate this risk.

5.4 Receptors

With reference to Part 2A of the Environmental Protection Act (1990), the potential receptors to be considered in any contaminated land scenario can be summarised as follows:

5.4.1 Human Health

For the purposes of this assessment it is assumed that the development end-use comprises low density residential housing, with public open space and gardens. Future residents are therefore considered the primary receptor of concern for any contamination risk to human health.

Construction workers/contractors could also be exposed to contaminants during any construction processes (i.e. during any demolition/redevelopment) as would any maintenance workers (working in the ground) following completion of any such development.

Users of the adjacent buildings (neighbouring residents) could also be potential receptors. The presence of Summerhill Primary School and Nursery located 10m south of the Site is noted.

5.4.2 Eco-systems

The Site is not located within 500m of a statutory protected site.

5.4.3 Controlled Water

Groundwater is classified as a Controlled Water body and therefore the groundwater beneath the Site requires consideration and protection as a potential receptor. The majority of the site indicated to be underlain by the Shirdley Hill Sand Formation (Secondary (A) Aquifer), followed by relatively low permeability Glacial Till (Unproductive Strata). This in turn overlays the bedrock sandstone, classified as a Principal Aquifer.

BGS Borehole records indicate the Principal Aquifer to be protected by a considerable thickness of Glacial Till (8.0-14.0m) anticipated to form a low permeability layer. The boreholes also indicate that the extent and thickness of the superficial Secondary (A) Aquifer (Shirdley Hill Sand) may be limited at this Site.

Surface watercourses are also Controlled Water receptors. The nearest identified features are Whinney Brook, running from the centre of the Site to the southwest corner, and an unnamed drainage ditch, exiting the site close to the southeast corner. The presence of Glacial Till close to the surface increases the probability of surface water runoff or near surface/perched groundwater flow at the Site. Surface water bodies on-site are therefore considered to be the primary receptor of concern for any contamination risk to Controlled Waters.

5.5 Preliminary Risk Assessment

Based on the CSM the following table presents the plausible pollutant linkages that apply to this site. An indicative qualitative assessment of the likelihood that a risk could be realised is provided in the table below:

Potential Receptor	Potential Source	Potential Pathway	Risk
<i>Human Health:</i> Residents	On- and off-site Made Ground associated with buildings, major earthworks, and infilled ponds and ditches.	Bulk ground gas Vapour inhalation Particulate inhalation (Asbestos)	Low, locally moderate
	Natural organics within alluvium in Whinney Brook flood plain.	Bulk ground gas inhalation	Low, locally moderate
	Soil-leachate and groundwater associated with off-site hospitals and railway.	Vapour inhalation	Low
	Soil-leachate and groundwater associated with on-site farms, warehouses, chimneys and substations.	Vapour inhalation Direct contact	Low
	Soil associated with on-site farms, warehouses, chimneys and substations.	Particulate inhalation Direct contact	Low
<i>Human Health:</i> Neighbouring residents	On-site Made Ground associated with buildings, major earthworks, and infilled ponds and ditches.	Bulk ground gas Vapour inhalation	Low
	Natural organics within alluvium in Whinney Brook flood plain.	Bulk ground gas inhalation	Low
	Soil-leachate and groundwater associated with on-site farms, warehouses, chimneys and substations.	Vapour inhalation	Low
<i>Controlled Water:</i> Secondary (A) Aquifer	On- and off-site Made Ground associated with buildings, major earthworks, and infilled ponds and ditches.	Leaching and migration of contaminants	Low
	Leaks/spills associated with on-site farms, warehouses, chimneys and substations.		Low
	Leaks/spills associated with off-site hospitals and railway.		Low
<i>Controlled Water:</i> Principal Aquifer	On- and off-site Made Ground associated with buildings, major earthworks, and infilled ponds and ditches.	Leaching and migration of contaminants	Low to negligible
	Leaks/spills associated with on-site farms, warehouses, chimneys and substations.		Low to negligible
	Leaks/spills associated with off-site hospitals and railway.		Low to negligible
<i>Controlled Water:</i> Surface Water	On- and off-site Made Ground associated with buildings, major earthworks, and infilled ponds and ditches.	Leaching and migration of contaminants	Low

Potential Receptor	Potential Source	Potential Pathway	Risk
	Leaks/spills associated with on-site farms, warehouses, chimneys and substations.	Surface runoff	Low
	Leaks/spills associated with off-site hospitals and railway.		Low
<i>Property (future buildings)</i>	Sulphate impacted soil & groundwater	Chemical Attack	Low
	Ground Gas	Structural damage due to explosion of combustible gas	Low
<i>Property (future landscaping – planting)</i>	Contaminated soil – phytotoxic contaminants	Root Uptake	Negligible, Locally low to moderate

5.6 Discussion

In general the contamination potential for the Site is considered LOW, on the basis of the general environmental setting, the site's development history and limited potentially contaminative processes on-site (present and historically). It should be noted that localised areas of higher risk may exist, especially in the vicinity of existing buildings and infilled ponds, where there is a greater probability of encountering Made Ground and of leaks, spills, poor waste disposal/demolition practice having occurred historically during agricultural/industrial processes and development.

Near-surface and surface contaminants in developed areas of the site could impact upon construction workers during redevelopment ground works activities, however it is envisaged that pre-commencement investigations/surveys, appropriate health and safety risk assessment and personal protective equipment would provide appropriate mitigation.

A risk (low, locally moderate) exists from hazardous ground gas in areas of Made Ground, infilled ponds and potential Alluvium until proven otherwise or mitigated through incorporation of appropriate gas protection measures into new buildings.

The environmental risk posed by the site to Controlled Water (groundwater and surface water) would only be significant if substantial, mobile, on-site ground contamination sources are confirmed to exist. The risk to groundwater (the Principal Aquifer) from site-derived impacts is not indicated to be significant due to the intervening unproductive superficial strata which might act to eliminate the migration pathway.

The significance of potential groundwater impacts associated with surrounding land uses has been assessed as low risk assuming a general shallow groundwater flow towards the northwest, as indicated by regional hydrological maps and the course of Whinney Brook. However, it should be noted that the Site lies within the source protection zone for a potable groundwater abstraction situated to the southeast and therefore this may result in local modifications to the groundwater flow direction i.e. towards the abstraction in the sandstone at depth.

Risks to property including chemical attack will be mitigated by survey and design.

6 Conclusions & Recommendations

6.1 Overview

This Phase 1 report presents an assessment of the geo-environmental information pertaining to the site based on readily available desktop/published sources and a site reconnaissance walkover survey.

The objective of this assessment was to collate and review the available geo-environmental information to determine potential ground contamination risks associated with the Site in its current condition and evaluate potential geo-environmental constraints with regards to its proposed future development.

6.2 Geo-Environmental Risks

From the review of the available site information it is unlikely that the historical land uses of the majority of the site and surrounding area will have generated significant or widespread contamination impacts at the site. Nonetheless a few relatively localised on-site and adjacent potential sources of contamination do exist.

The preliminary risk associated with any “active” Source-Pathway-Receptor linkages is in the majority of cases considered to be low, but locally elevated in the vicinity of existing buildings, where there is a greater probability of encountering Made Ground and of leaks, spills, poor waste disposal/demolition practice having occurred historically during agricultural/industrial processes and previous development. Under the development proposals certain exposure pathways will remain active (particularly in private garden, landscaped and public open space areas and during development) and therefore may require mitigation by management and design.

A potential moderate risk also exists from hazardous ground gas in areas of Infilled/Made Ground (former ponds) and areas where potentially organic alluvial soils may be present until proven otherwise or is quantified with appropriate recommendations for mitigation measures.

The environmental risk posed by the site to Controlled Water receptors is not anticipated to be significant; however this should be confirmed by appropriate testing and risk assessment during Phase 2 Investigations if substantial, mobile, on-site ground contamination sources are encountered.

6.3 Preliminary Geotechnical Appraisal

The site topsoil (~0.5m thick according to BGS borehole records) is indicated to be underlain by a thin layer of Shirdley Hill Sand (potentially absent locally/reworked into topsoil) in turn underlain by a significant thickness of predominantly cohesive Glacial Till. Whilst not mapped at 1:50,000 scale, given the indicative areas of flood plain (as indicated by the EA flood zone maps) there is also the potential for alluvial deposits to be present near the surface and above the Glacial Till in the vicinity of Whinney Brook (particularly in the southwest quadrant of the site).

The Glacial Till deposits are indicated to extend to depths of around 12mbgl in the site area and based on BGS borehole log SD30SE100 are anticipated to be of stiff consistency at relatively shallow depth (i.e. 1 to 2mbgl) and firm beneath; however there is significant potential for this to vary across the site.

Beneath the drift deposits, the site is underlain by Sherwood Sandstone.

Traditional spread foundations (shallow strips or trench fill) bearing onto Glacial Till may be feasible; subject to confirmation that the ground conditions are reasonably competent across new build areas. In areas of infilled/Made Ground, foundations will either need to extend beneath these deposits to competent underlying strata or incorporate some form of ground-improvement together with nominally reinforced foundations. The chosen foundation solution will need to take into consideration the groundwater regime and the potential for groundwater/perched water table to be encountered at shallow depths. Whilst the groundwater ingress into open excavations is likely to be slow in cohesive soils, the stability of saturated/partially saturated Shirdley Hill Sand deposits can be poor and manifest as ‘running sands’. Due allowance should therefore be made for dealing with shallow groundwater and excavation stability issues.

Given the potential for cohesive subsoils at shallow depths and in the absence of adequate testing, a low CBR value should be assumed for the design of new road pavement at this stage.

In consideration of the indicated site geology and near-surface ground conditions, it is unlikely that on-site soakaways will be feasible to attenuate surface water drainage and therefore discharge of surface water to the onsite watercourse at an appropriate/restricted discharge rate (i.e. with suitable storm water storage and attenuation) would likely be the preferred option.

6.4 Recommendations

Prior to any redevelopment of the site, Phase 2 Intrusive Investigations will be required to establish the nature of the ground conditions and to obtain development-specific geotechnical design parameters. In particular future intrusive investigations will be required to establish the depth to competent bearing strata.

The investigation strategy should also include an “environmental” investigation; designed to interrogate the Phase 1 CSM, establish the status of the identified Source-Pathway-Receptor linkages and thereby reduced uncertainties in the PRA.

Assessment of regional UXO maps indicates that the Site is within a high bomb risk region. Further assessment may be necessary to clarify the nature and extent of potential UXO issues prior to undertaking any intrusive investigative works or development.

APPENDIX A

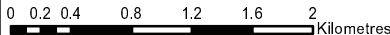
Figures

Figure 1: Site Location Plan

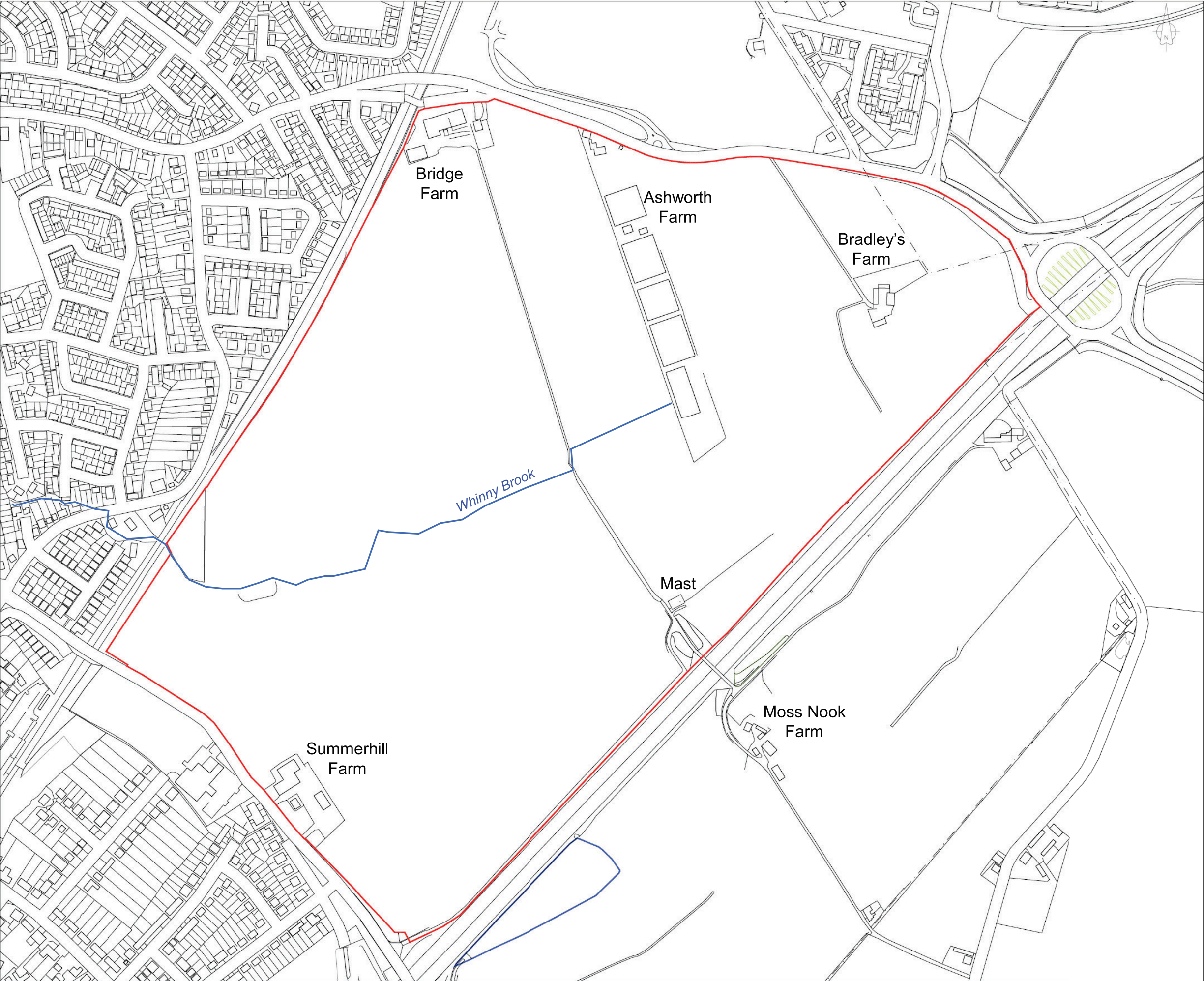
Figure 2: Site Layout Plan



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CONTACT ARCADIS UK IN CASE ANY QUERY

LEGEND	NOTES
 SITE LOCATION	SYMBOLS FOR BOREHOLES, TRIAL PITS AND OTHER SPECIFIC FEATURES ARE REPRESENTATIONS OF LOCATION ONLY AND UNLESS OTHERWISE SPECIFIED, DO NOT REPRESENT THE TRUE SIZE OF THE FEATURE.
 N 	

TITLE: SITE LOCATION PLAN	
SITE: LAND OFF POVERTY LANE, MAGULL	
CLIENT: PERSIMON HOMES (LANCASHIRE) LTD, COUNTRYSIDE PROPERTIES PLC	
PROJECT: 36708100	FIGURE 1
DATE: 02/03/17	DRAWN BY: BNB
DRG No.: 3670810003 GIS	
SCALE: 1 : 50,000	PRINT: A4
 Design & Consultancy for natural and built assets	



Revision			Date	Amendment	File
Development: Land East of Maghull					
Location: MAGHULL					
Marking Name:					
Drawing Title: Location Plan					
Drawing Number: PLM.LP3					
Revision:		Scale @ A1:		1:2500	
Drawn By: A.Pa		Date Started:		05.04.16	
Checked by:				Date:	

**PERSIMMON**
Persimmon Homes Lancashire
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Tel: 01524 442 000 Fax: 01524 442 300 Web: www.persimmonhomes.com

APPENDIX B

Site Walkover Photographs

CLIENT:	Persimmon Homes (Lancashire), Countryside Properties	DATE:	27/02/2017	 ARCADIS Design & Consultancy for natural and built assets	
REFERENCE:	36708100	SITE NAME:	Land off Poverty Lane, Maghull	10 th Floor Three Piccadilly Place Manchester M1 3BN	T: 0161 245 8700 F: 0161 245 8701
Plate 1 – View from the south western corner of the Site, including Whinny Brook.					
Plate 2 – View from the south east corner of the Site					

CLIENT:	Persimmon Homes (Lancashire), Countryside Properties	DATE:	27/02/2017	 ARCADIS Design & Consultancy for natural and built assets	
REFERENCE:	36708100	SITE NAME:	Land off Poverty Lane, Maghull	10 th Floor Three Piccadilly Place Manchester M1 3BN	T: 0161 245 8700 F: 0161 245 8701
Plate 3 – View along the south eastern site boundary with M58 motorway to the south east, and mobile telephone mast and access bridge to Moss Nook Farm in the background.					
Plate 4 – View of the north west corner of the Site, with M58 / School Lane interchange in the background.					

CLIENT:	Persimmon Homes (Lancashire), Countryside Properties	DATE:	27/02/2017	 ARCADIS		Design & Consultancy for natural and built assets
REFERENCE:	36708100	SITE NAME:	Land off Poverty Lane, Maghull	10 th Floor Three Piccadilly Place Manchester M1 3BN	T: 0161 245 8700 F: 0161 245 8701	
Plate 5 – View from the northern boundary, with Ashworth farm in the coppice to the right of the image.						
Plate 6 – View from the north western boundary.						

CLIENT:	Persimmon Homes (Lancashire), Countryside Properties	DATE:	27/02/2017	 ARCADIS Design & Consultancy for natural and built assets	
REFERENCE:	36708100	SITE NAME:	Land off Poverty Lane, Maghull	10 th Floor Three Piccadilly Place Manchester M1 3BN	T: 0161 245 8700 F: 0161 245 8701
Plate 7 – Electrical infrastructure by the mobile phone mast in the south east of the Site.					
Plate 8 – Barn / Warehouse at Bridge Farm associated with pallet distribution company.					

CLIENT:	Persimmon Homes (Lancashire), Countryside Properties	DATE:	27/02/2017	 ARCADIS Design & Consultancy for natural and built assets	
REFERENCE:	36708100	SITE NAME:	Land off Poverty Lane, Maghull	10 th Floor Three Piccadilly Place Manchester M1 3BN	T: 0161 245 8700 F: 0161 245 8701
Plate 9 – Electrical infrastructure at Bridge Farm					
Plate 10 – Sewage pumping station, adjacent to Bridge Farm.					

CLIENT:	Persimmon Homes (Lancashire), Countryside Properties	DATE:	27/02/2017	 ARCADIS Design & Consultancy for natural and built assets	
REFERENCE:	36708100	SITE NAME:	Land off Poverty Lane, Maghull	10 th Floor Three Piccadilly Place Manchester M1 3BN	T: 0161 245 8700 F: 0161 245 8701
Plate 10 – Derelict barns and glass houses at Ashworth Farm					
Plate 11 – Disused Chimney at Ashworth Farm					

CLIENT:	Persimmon Homes (Lancashire), Countryside Properties	DATE:	27/02/2017	 ARCADIS		Design & Consultancy for natural and built assets
REFERENCE:	36708100	SITE NAME:	Land off Poverty Lane, Maghull	10 th Floor Three Piccadilly Place Manchester M1 3BN	T: 0161 245 8700 F: 0161 245 8701	
Plate 12 – Substation at Ashworth Farm						
Plate 13 – Whinny Brook, with Ashworth Farm coppice in the background						

CLIENT:	Persimmon Homes (Lancashire), Countryside Properties	DATE:	27/02/2017	 ARCADIS		Design & Consultancy for natural and built assets
REFERENCE:	36708100	SITE NAME:	Land off Poverty Lane, Maghull	10 th Floor Three Piccadilly Place Manchester M1 3BN	T: 0161 245 8700 F: 0161 245 8701	
Plate 14 – Unnamed drainage ditches in the south east of the site, exiting the site on the south eastern boundary (to the left of the image)						
Plate 15 – Summer Hill Farm						

APPENDIX C

Groundsure Report & Historical Maps



Arcadis LLP

Arcadis UK Ltd, 3 PICCADILLY PLACE,
MANCHESTER, M1 3BN

Groundsure
Reference:

GS-3683403

Your Reference: 3013996

Report Date

24 Feb 2017

Report Delivery Method: Email - pdf

Groundsure Enviro Insight

Address: ASHWORTH FARM, 1, SCHOOL LANE, LIVERPOOL, L31 1BE

Dear Sir/ Madam,

Thank you for placing your order with Groundsure. Please find enclosed the **Groundsure Enviro Insight** as requested.

If you need any further assistance, please do not hesitate to contact our helpline on 08444 159000 quoting the above Groundsure reference number.

Yours faithfully,



Managing Director
Groundsure Limited

Enc.
Groundsure Enviroinsight

Groundsure Enviro Insight

Address: ASHWORTH FARM, 1, SCHOOL LANE, LIVERPOOL, L31 1BE
Date: 24 Feb 2017
Reference: GS-3683403
Client: Arcadis LLP



Aerial Photograph Capture date: 11-Jun-2015
Grid Reference: 339140,401957
Site Size: 86.09ha

Report Reference: GS-3683403
Client Reference: 3013996

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Overview of Findings

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Section 1: Historical Industrial Sites	On-site	0-50	51-250	251-500
1.1 Potentially Contaminative Uses identified from 1:10,000 scale mapping	4	19	17	34
1.2 Additional Information – Historical Tank Database	0	0	5	2
1.3 Additional Information – Historical Energy Features Database	2	4	12	25
1.4 Additional Information – Historical Petrol and Fuel Site Database	0	0	0	0
1.5 Additional Information – Historical Garage and Motor Vehicle Repair Database	0	0	0	3
1.6 Potentially Infilled Land	14	19	38	18

Section 2: Environmental Permits, Incidents and Registers	On-site	0-50m	51-250	251-500
2.1 Industrial Sites Holding Environmental Permits and/or Authorisations				
2.1.1 Records of historic IPC Authorisations	0	0	0	0
2.1.2 Records of Part A(1) and IPPC Authorised Activities	0	0	0	0
2.1.3 Records of Red List Discharge Consents	0	0	0	0
2.1.4 Records of List 1 Dangerous Substances Inventory sites	0	0	0	0
2.1.5 Records of List 2 Dangerous Substances Inventory sites	0	0	0	0
2.1.6 Records of Part A(2) and Part B Activities and Enforcements	0	0	0	1
2.1.7 Records of Category 3 or 4 Radioactive Substances Authorisations	0	0	0	0
2.1.8 Records of Licensed Discharge Consents	0	0	0	1
2.1.9 Records of Water Industry Referrals	0	0	0	0
2.1.10 Records of Planning Hazardous Substance Consents and Enforcements within 500m of the study site	0	0	0	0
2.2 Records of COMAH and NIHHS sites	0	0	0	0
2.3 Environment Agency/Natural Resources Wales Recorded Pollution Incidents				
2.3.1 National Incidents Recording System, List 2	0	0	1	0
2.3.2 National Incidents Recording System, List 1	0	0	0	0
2.4 Sites Determined as Contaminated Land under Part 2A EPA 1990	0	0	0	0

Section 3: Landfill and Other Waste Sites	On-site	0-50m	51-250	251-500	501-1000	1000-1500
3.1 Landfill Sites						
3.1.1 Environment Agency/Natural Resources Wales Registered Landfill Sites	0	0	0	0	0	Not searched
3.1.2 Environment Agency/Natural Resources Wales Historic Landfill Sites	0	0	0	0	1	4
3.1.3 BGS/DoE Landfill Site Survey	0	0	0	0	0	0
3.1.4 Records of Landfills in Local Authority and Historical Mapping Records	0	0	0	0	1	0
3.2 Landfill and Other Waste Sites Findings						
3.2.1 Operational and Non-Operational Waste Treatment, Transfer and Disposal Sites	0	0	0	0	Not searched	Not searched
3.2.2 Environment Agency/Natural Resources Wales Licensed Waste Sites	0	0	0	0	0	0

Section 4: Current Land Use	On-site	0-50m	51-250	251-500
4.1 Current Industrial Sites Data	2	2	9	Not searched
4.2 Records of Petrol and Fuel Sites	0	0	0	1
4.3 National Grid Underground Electricity Cables	0	0	0	0
4.4 National Grid Gas Transmission Pipelines	0	0	0	0

Section 5: Geology	
5.1 Are there any records of Artificial Ground and Made Ground present beneath the study site?	No
5.2 Are there any records of Superficial Ground and Drift Geology present beneath the study site?	Yes
5.3 For records of Bedrock and Solid Geology beneath the study site see the detailed findings section.	

Section 6: Hydrogeology and Hydrology				0-500m		
6.1 Are there any records of Strata Classification in the Superficial Geology within 500m of the study site?				Yes		
6.2 Are there any records of Strata Classification in the Bedrock Geology within 500m of the study site?				Yes		
	On-site	0-50m	51-250	251-500	501-1000	1000-2000
6.3 Groundwater Abstraction Licences (within 2000m of the study site)	0	0	0	0	3	4
6.4 Surface Water Abstraction Licences (within 2000m of the study site)	0	0	0	0	2	17
6.5 Potable Water Abstraction Licences (within 2000m of the study site)	0	0	0	0	3	1
6.6 Source Protection Zones (within 500m of the study site)	1	0	2	1	Not searched	Not searched
6.7 Source Protection Zones within Confined Aquifer	0	0	0	0	Not searched	Not searched
6.8 Groundwater Vulnerability and Soil Leaching Potential (within 500m of the study site)	5	1	1	3	Not searched	Not searched

Section 6: Hydrogeology and Hydrology	0-500m					
	On-site	0-50m	51-250	251-500	501-1000	1000-1500
6.9 Is there any Environment Agency/Natural Resources Wales information on river quality within 1500m of the study site?	No	No	No	No	No	No
6.10 Detailed River Network entries within 500m of the site	18	3	16	20	Not searched	Not searched
6.11 Surface water features within 250m of the study site	Yes	Yes	Yes	Not searched	Not searched	Not searched

Section 7: Flooding						
7.1 Are there any Environment Agency Zone 2 floodplains within 250m of the study site?	Yes					
7.2 Are there any Environment Agency/Natural Resources Wales Zone 3 floodplains within 250m of the study site	Yes					
7.3 What is the Risk of flooding from Rivers and the Sea (RoFRaS) rating for the study site?	High					
7.4 Are there any Flood Defences within 250m of the study site?	No					
7.5 Are there any areas benefiting from Flood Defences within 250m of the study site?	No					
7.6 Are there any areas used for Flood Storage within 250m of the study site?	No					
7.7 What is the maximum BGS Groundwater Flooding susceptibility within 50m of the study site?	Limited potential					
7.8 What is the BGS confidence rating for the Groundwater Flooding susceptibility areas?	Low					

Section 8: Designated Environmentally Sensitive Sites	On-site	0-50m	51-250	251-500	501-1000	1000-2000
8.1 Records of Sites of Special Scientific Interest (SSSI)	0	0	0	0	0	0
8.2 Records of National Nature Reserves (NNR)	0	0	0	0	0	0
8.3 Records of Special Areas of Conservation (SAC)	0	0	0	0	0	0
8.4 Records of Special Protection Areas (SPA)	0	0	0	0	0	0
8.5 Records of Ramsar sites	0	0	0	0	0	0
8.6 Records of Ancient Woodlands	0	0	0	0	0	0
8.7 Records of Local Nature Reserves (LNR)	0	0	0	0	0	0
8.8 Records of World Heritage Sites	0	0	0	0	0	0
8.9 Records of Environmentally Sensitive Areas	0	0	0	0	0	0

Section 8: Designated Environmentally Sensitive Sites	On-site	0-50m	51-250	251-500	501-1000	1000-2000
8.10 Records of Areas of Outstanding Natural Beauty (AONB)	0	0	0	0	0	0
8.11 Records of National Parks	0	0	0	0	0	0
8.12 Records of Nitrate Sensitive Areas	0	0	0	0	0	0
8.13 Records of Nitrate Vulnerable Zones	1	0	1	0	0	2
8.14 Records of Green Belt land	1	0	1	0	2	2

Section 9: Natural Hazards	
9.1 What is the maximum risk of natural ground subsidence?	Low
9.1.1 What is the maximum Shrink-Swell hazard rating identified on the study site?	Very Low
9.1.2 What is the maximum Landslides hazard rating identified on the study site?	Very Low
9.1.3 What is the maximum Soluble Rocks hazard rating identified on the study site?	Negligible
9.1.4 What is the maximum Compressible Ground hazard rating identified on the study site?	Negligible
9.1.5 What is the maximum Collapsible Rocks hazard rating identified on the study site?	Very Low
9.1.6 What is the maximum Running Sand hazard rating identified on the study site?	Low
9.2 Radon	
9.2.1 Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level?	The property is not in a Radon Affected Area, as less than 1% of properties are above the Action Level.
9.2.2 Is the property in an area where Radon Protection are required for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment?	No radon protective measures are necessary.

Section 10: Mining	
10.1 Are there any coal mining areas within 75m of the study site?	No
10.2 Are there any Non-Coal Mining areas within 50m of the study site boundary?	No
10.3 Are there any brine affected areas within 75m of the study site?	No

Using this report

The following report is designed by Environmental Consultants for Environmental Professionals bringing together the most up-to-date market leading environmental data. This report is provided under and subject to the Terms & Conditions agreed between Groundsure and the Client. The document contains the following sections:

1. Historical Industrial Sites

Provides information on past land uses that may pose a risk to the study site in terms of potential contamination from activities or processes. Potentially Infilled Land features are also included. This search is conducted using radii of up to 500m.

2. Environmental Permits, Incidents and Registers

Provides information on Regulated Industrial Activities and Pollution Incidents as recorded by Regulatory Authorities, and sites determined as Contaminated Land. This search is conducted using radii up to 500m.

3. Landfills and Other Waste Sites

Provides information on landfills and other waste sites that may pose a risk to the study site. This search is conducted using radii up to 1500m.

4. Current Land Uses

Provides information on current land uses that may pose a risk to the study site in terms of potential contamination from activities or processes. These searches are conducted using radii of up to 500m. This includes information on potentially contaminative industrial sites, petrol stations and fuel sites as well as high pressure gas pipelines and underground electricity transmission lines.

5. Geology

Provides information on artificial and superficial deposits and bedrock beneath the study site.

6. Hydrogeology and Hydrology

Provides information on productive strata within the bedrock and superficial geological layers, abstraction licenses, Source Protection Zones (SPZs) and river quality. These searches are conducted using radii of up to 2000m.

7. Flooding

Provides information on river and coastal flooding, flood defences, flood storage areas and groundwater flood areas. This search is conducted using radii of up to 250m.

8. Designated Environmentally Sensitive Sites

Provides information on the Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR), Special Areas of Conservation (SAC), Special Protection Areas (SPA), Ramsar sites, Local Nature Reserves (LNR), Areas of Outstanding Natural Beauty (AONB), National Parks (NP), Environmentally Sensitive Areas, Nitrate Sensitive Areas, Nitrate Vulnerable Zones and World Heritage Sites and Scheduled Ancient Woodland. These searches are conducted using radii of up to 2000m.

9. Natural Hazards

Provides information on a range of natural hazards that may pose a risk to the study site. These factors include natural ground subsidence and radon..

10. Mining

Provides information on areas of coal and non-coal mining and brine affected areas.

11. Contacts

This section of the report provides contact points for statutory bodies and data providers that may be able to provide further information on issues raised within this report. Alternatively, Groundsure provide a free Technical Helpline (08444 159000) for further information and guidance.

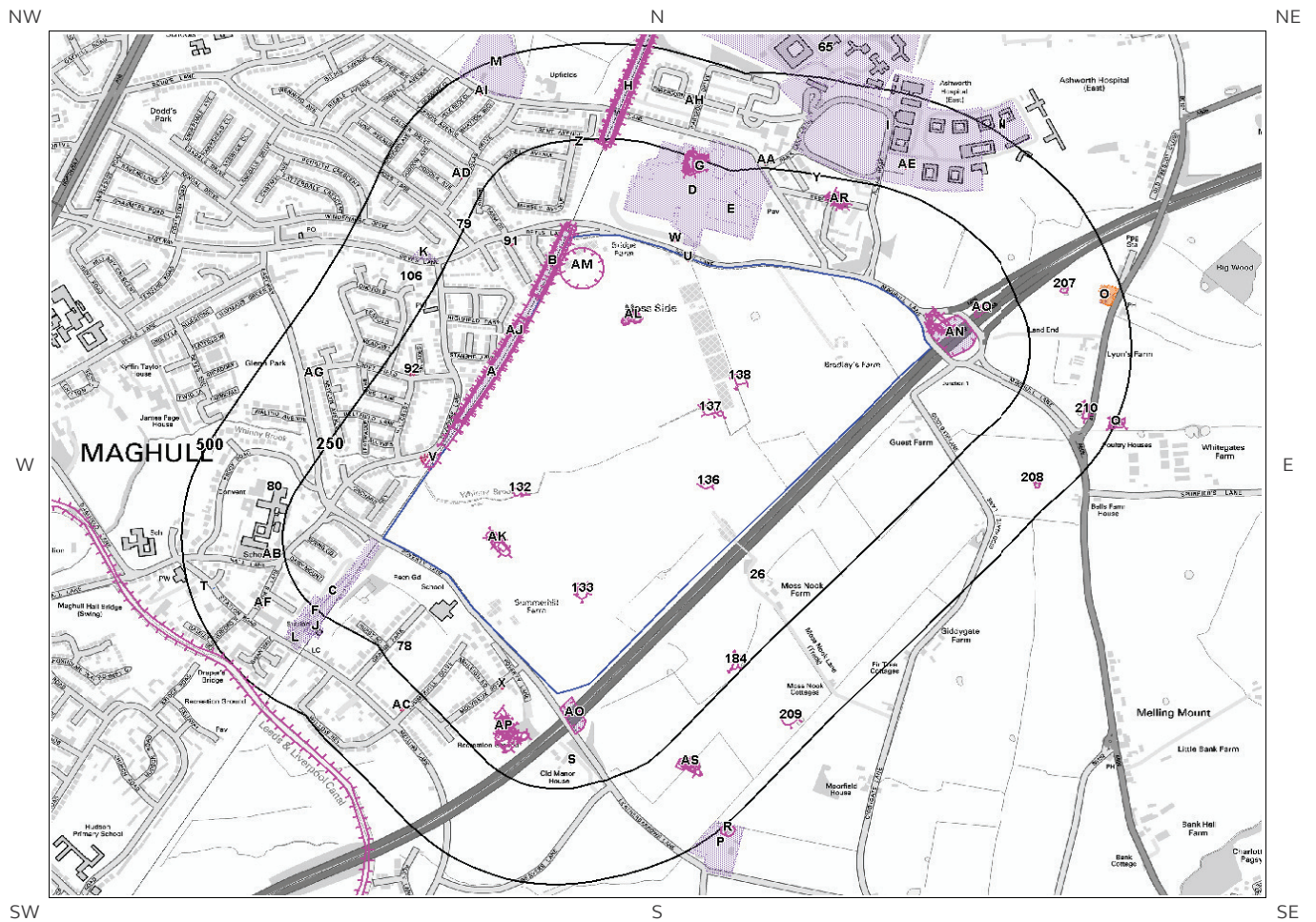
Note: Maps

Only certain features are placed on the maps within the report. All features represented on maps found within this search are given an identification number. This number identifies the feature on the mapping and correlates it to the additional information provided below. This identification number precedes all other information and takes the following format -Id: 1, Id: 2, etc. Where numerous features on the same map are in such close proximity that the numbers would obscure each other a letter identifier is used instead to represent the features. (e.g. Three features which overlap may be given the identifier "A" on the map and would be identified separately as features 1A, 3A, 10A on the data tables provided).

Where a feature is reported in the data tables to a distance greater than the map area, it is noted in the data table as "Not Shown".

All distances given in this report are in Metres (m). Directions are given as compass headings such as N: North, E: East, NE: North East from the nearest point of the study site boundary.

1. Historical Land Use



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Historical 1:10,000 and 1:10,560 scale mapping



Site Outline



Industrial Land Use



Potentially Infilled Land

Historical 1:2,500, 1:1,250 and 1:500 scale mapping



Search Buffers (m)



Energy Features



Petrol Stations



Tanks



Garages

1. Historical Industrial Sites

1.1 Potentially Contaminative Uses identified from 1:10,000 scale Mapping

The systematic analysis of data extracted from standard 1:10,560 and 1:10,000 scale historical maps provides the following information:

Records of sites with a potentially contaminative past land use within 500m of the search boundary: 74

ID	Distance [m]	Direction	Use	Date
1B	0	On Site	Cuttings	1892
2A	0	On Site	Cuttings	1892
3V	0	On Site	Cuttings	1851
4AJ	0	On Site	Cuttings	1851
5A	1	NW	Cuttings	1968
6A	1	NW	Cuttings	1938
7A	1	NW	Cuttings	1892
8A	1	NW	Cuttings	1907
9A	1	NW	Cuttings	1926
10B	3	NW	Cuttings	1968
11B	4	NW	Cuttings	1892
12B	4	NW	Cuttings	1907
13B	4	NW	Cuttings	1926
14B	4	NW	Cuttings	1938
15D	11	N	Hospital	1968
16AN	17	E	Cuttings	1985
17C	18	SW	Railway Sidings	1968
18AO	19	S	Cuttings	1985
19C	23	SW	Railway Sidings	1938
20C	23	SW	Railway Sidings	1925
21C	23	SW	Railway Sidings	1907
22D	30	N	Hospital	1974
23D	30	N	Hospital	1985
24E	99	N	Hospital	1926
25E	99	N	Hospital	1938
26	111	SE	Pump	1851
27F	124	SW	Railway Sidings	1891
28F	176	SW	Railway Sidings	1851
29G	217	N	Unspecified Heap	1938
30G	217	N	Unspecified Heap	1907
31G	217	N	Unspecified Heap	1926
32G	217	N	Unspecified Heap	1892
33G	224	N	Unspecified Heap	1968
34H	230	N	Cuttings	1851

35H	232	N	Cuttings	1926
36H	232	N	Cuttings	1892
37H	232	N	Cuttings	1907
38H	232	N	Cuttings	1938
39H	236	N	Cuttings	1968
40H	240	N	Cuttings	1892
41F	257	SW	Railway Station	1851
42I	262	N	Hospital	1974
43I	264	N	Hospital	1985
44K	268	NW	Smithy	1892
45J	280	SW	Railway Station	1985
46J	280	SW	Railway Station	1974
47J	284	SW	Railway Station	1968
48J	289	SW	Railway Station	1907
49J	289	SW	Railway Station	1925
50J	289	SW	Railway Station	1938
51K	290	NW	Smithy	1892
52K	291	NW	Smithy	1907
53J	294	SW	Railway Station	1891
54L	344	SW	Railway Building	1907
55L	344	SW	Railway Building	1925
56L	346	SW	Railway Building	1907
57M	383	N	Sanatorium	1938
58M	383	N	Sanatorium	1926
59M	385	N	Sanatorium	1968
60N	431	NE	Hospital	1974
61N	431	NE	Hospital	1987
62O	438	E	Garage	1974
63O	441	E	Garage	1987
64T	462	W	Pump	1851
65	476	N	Hospital	1985
66P	477	SE	Pumping Station	1985
67P	477	SE	Pumping Station	1968
68P	477	SE	Pumping Station	1974
69P	482	SE	Pumping Station	1925
70Q	486	SE	Unspecified Pit	1926
71Q	486	SE	Unspecified Pit	1938
72Q	489	E	Unspecified Pit	1955
73R	497	SE	Unspecified Heap	1974
74R	497	SE	Unspecified Heap	1985

1.2 Additional Information – Historical Tank Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical tanks within 500m of the search boundary:

7

ID	Distance (m)	Direction	Use	Date
75D	173	N	Unspecified Tank	1927
76S	184	S	Unspecified Tank	1961
77S	184	S	Unspecified Tank	1971
78	199	SW	Unspecified Tank	1982
79	250	NW	Unspecified Tank	1892
80	296	NW	Tanks	1961
81T	439	W	Unspecified Tank	1927

1.3 Additional Information – Historical Energy Features Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical energy features within 500m of the search boundary:

43

ID	Distance (m)	Direction	Use	Date
82U	0	On Site	Electricity Substation	1993
83U	0	On Site	Electricity Substation	1983
84W	24	N	Electricity Substation	1987
85V	24	NW	Electricity Substation	1993
86V	25	NW	Electricity Substation	1973
87W	25	N	Electricity Substation	1998
88X	86	SW	Electricity Substation	1982
89X	86	SW	Electricity Substation	1993
90X	86	SW	Electricity Substation	1986
91	119	NW	Electricity Substation	1970
92	173	NW	Electricity Substation	1970
93Y	230	N	Electricity Substation	1995
94Y	230	N	Electricity Substation	1987
95Y	231	N	Electricity Substation	1984
96Z	234	N	Electricity Substation	1998
97Z	235	N	Electricity Substation	1987
98Z	236	N	Electricity Substation	1975
99Z	237	N	Electricity Substation	1993
100AA	260	N	Gas Governor	1998

101AA	260	N	Gas Governor	1987
102AB	278	W	Electricity Substation	1971
103AB	278	W	Electricity Substation	1971
104AB	278	W	Electricity Substation	1993
105AB	279	W	Electricity Substation	1985
106	306	NW	Electricity Substation	1970
107AC	307	SW	Electricity Substation	1982
108AC	307	SW	Electricity Substation	1986
109AC	307	SW	Electricity Substation	1993
110AD	308	NW	Electricity Substation	1993
111AD	309	NW	Electricity Substation	1975
112AE	310	N	Electricity Substation	1984
113AE	317	N	Electricity Substation	1987
114AE	318	N	Electricity Substation	1995
115AF	345	SW	Electricity Substation	1971
116AF	345	SW	Electricity Substation	1971
117AF	345	SW	Electricity Substation	1993
118AF	346	SW	Electricity Substation	1985
119AG	375	NW	Electricity Substation	1993
120AG	376	NW	Electricity Substation	1969
121AH	379	N	Electricity Substation	1998
122AH	380	N	Electricity Substation	1987
123AI	432	NW	Electricity Substation	1993
124AI	432	NW	Electricity Substation	1975

1.4 Additional Information – Historical Petrol and Fuel Site Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical petrol stations and fuel sites within 500m of the search boundary: 0

Database searched and no data found.

1.5 Additional Information – Historical Garage and Motor Vehicle Repair Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical garage and motor vehicle repair sites within 500m of the search boundary: 3

ID	Distance (m)	Direction	Use	Date
125O	437	E	Garage	1983
126O	443	E	Garage	1982

127O	444	E	Garage	1972
------	-----	---	--------	------

1.6 Potentially Infilled Land

Records of Potentially Infilled Features from 1:10,000 scale mapping within 500m of the study site: 89

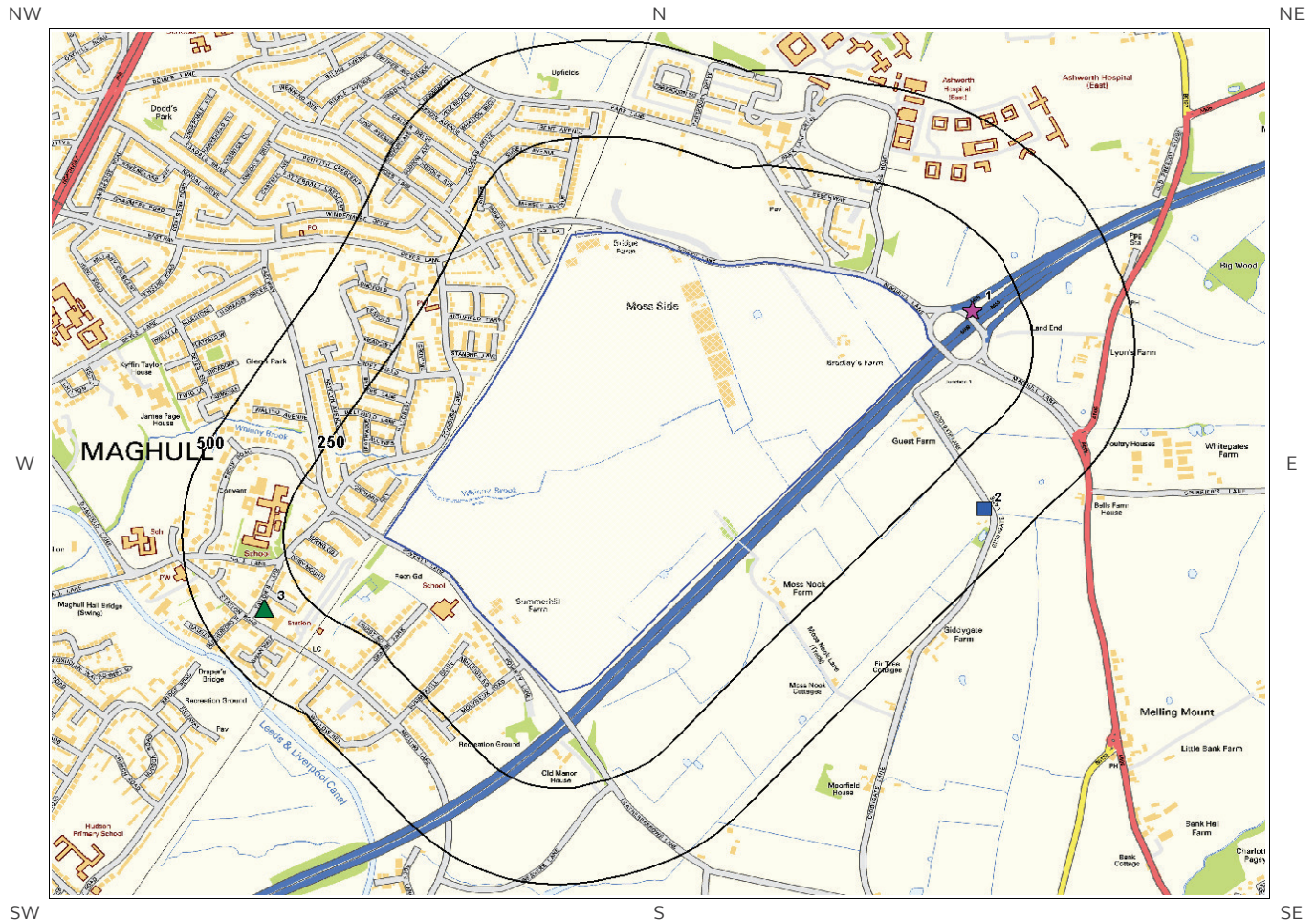
The following Historical Potentially Infilled Features derived from the Historical Mapping information is provided by Groundsure:

ID	Distance(m)	Direction	Use	Date
128V	0	On Site	Cuttings	1851
129AJ	0	On Site	Cuttings	1851
130AK	0	On Site	Ponds	1851
131AK	0	On Site	Ponds	1891
132	0	On Site	Pond	1851
133	0	On Site	Pond	1851
134AL	0	On Site	Ponds	1907
135AL	0	On Site	Ponds	1892
136	0	On Site	Pond	1851
137	0	On Site	Ponds	1851
138	0	On Site	Pond	1851
139A	0	On Site	Cuttings	1892
140B	0	On Site	Cuttings	1892
141AM	0	On Site	Pool	1892
142A	1	NW	Cuttings	1968
143A	1	NW	Cuttings	1907
144A	1	NW	Cuttings	1892
145A	1	NW	Cuttings	1926
146A	1	NW	Cuttings	1938
147AM	3	NW	Cuttings	1968
148B	4	NW	Cuttings	1892
149B	4	NW	Cuttings	1926
150B	4	NW	Cuttings	1907
151B	4	NW	Cuttings	1938
152AN	11	E	Ponds	1851
153AN	15	E	Ponds	1892
154AN	15	E	Ponds	1907
155AN	15	E	Ponds	1926
156AN	15	E	Ponds	1938
157AN	17	E	Cuttings	1985
158AN	17	E	Ponds	1892
159AN	19	E	Ponds	1968
160AO	19	S	Cuttings	1985
161AP	126	SW	Ponds	1851
162AP	127	SW	Ponds	1891
163AP	128	SW	Ponds	1925
164AP	131	SW	Ponds	1968

165AQ	135	E	Ponds	1926
166AQ	135	E	Ponds	1907
167AQ	135	E	Ponds	1892
168AQ	135	E	Ponds	1938
169AP	136	SW	Ponds	1907
170AP	139	SW	Pond	1938
171AR	177	N	Pond	1892
172AR	180	N	Pond	1938
173AR	180	N	Pond	1892
174AR	180	N	Pond	1926
175AR	180	N	Pond	1907
176AR	184	N	Pond	1851
177G	201	N	Pond	1892
178G	206	N	Pond	1907
179G	206	N	Pond	1892
180G	206	N	Pond	1938
181G	206	N	Pond	1926
182G	213	N	Pond	1851
183G	213	N	Pond	1968
184	215	SE	Pond	1851
185G	215	N	Pond	1985
186G	215	N	Pond	1974
187G	217	N	Unspecified Heap	1907
188G	217	N	Unspecified Heap	1926
189G	217	N	Unspecified Heap	1892
190G	217	N	Unspecified Heap	1938
191G	224	N	Unspecified Heap	1968
192H	230	N	Cuttings	1851
193H	232	N	Cuttings	1907
194H	232	N	Cuttings	1938
195H	232	N	Cuttings	1926
196H	232	N	Cuttings	1892
197H	236	N	Cuttings	1968
198H	240	N	Cuttings	1892
199AS	297	SE	Ponds	1968
200AS	297	SE	Ponds	1985
201AS	297	SE	Ponds	1974
202AS	301	SE	Ponds	1907
203AS	301	SE	Ponds	1925
204AS	301	SE	Ponds	1938
205AS	301	SE	Ponds	1891
206AS	308	SE	Pond	1851
207	356	NE	Pond	1955
208	404	SE	Ponds	1891
209	412	SE	Pond	1851
210	414	E	Ponds	1892

211Q	486	SE	Unspecified Pit	1926
212Q	486	SE	Unspecified Pit	1938
213Q	489	E	Unspecified Pit	1955
214R	497	SE	Unspecified Heap	1974
215R	497	SE	Unspecified Heap	1985
216	499	SW	Canal	1851

2. Environmental Permits, Incidents and Registers Map



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- | | | | | | |
|--|--------------------|--|-------------------------------|--|--|
| | Site Outline | | Recorded Pollution Incident | | RAS 3 & 4 Authorisations |
| | Search Buffers (m) | | Dangerous Substances (List 1) | | Part A(1) Authorised Processes and Historic IPC Authorisations |
| | | | Dangerous Substances (List 2) | | Part A(2) and Part B Authorised Processes |
| | | | Water Industry Referrals | | COMAH / NIHHS Sites |
| | | | Licenced Discharge Consents | | Sites Determined as Contaminated Land |
| | | | Red List Discharge Consents | | Hazardous Substance Consents and Enforcements |

2. Environmental Permits, Incidents and Registers

2.1 Industrial Sites Holding Licences and/or Authorisations

Searches of information provided by the Environment Agency/Natural Resources Wales and Local Authorities reveal the following information:

2.1.1 Records of historic IPC Authorisations within 500m of the study site:

0

Database searched and no data found.

2.1.2 Records of Part A(1) and IPPC Authorised Activities within 500m of the study site:

0

Database searched and no data found.

2.1.3 Records of Red List Discharge Consents (potentially harmful discharges to controlled waters) within 500m of the study site:

0

Database searched and no data found.

2.1.4 Records of List 1 Dangerous Substances Inventory Sites within 500m of the study site:

0

Database searched and no data found.

2.1.5 Records of List 2 Dangerous Substance Inventory Sites within 500m of the study site:

0

Database searched and no data found.

2.1.6 Records of Part A(2) and Part B Activities and Enforcements within 500m of the study site:

1

The following Part A(2) and Part B Activities are represented as points on the Environmental Permits, Incidents and Registers Map:

ID	Distance (m)	Direction	NGR	Details
3	354	SW	338220 401536	Address: Smartys, 3 Tree View Court, Maghull, Merseyside, L31 3HF Process: Dry Cleaning Status: Revoked Permit Type: Part B Enforcement: No Enforcement Notified Date of Enforcement: No Enforcement Notified Comment: No Enforcement Notified

2.1.7 Records of Category 3 or 4 Radioactive Substances Authorisations:

0

Database searched and no data found.

2.1.8 Records of Licensed Discharge Consents within 500m of the study site:

1

The following Licensed Discharge Consents records are represented as points on the Environmental Permits, Incidents and Registers Map:

ID	Distance (m)	Direction	NGR	Details
2	386	SE	340000 401800	Address: MOSS NOOK COTTAGES (1), MOSS NOOK LANE, MAGHULL, LANCASHIRE Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY Permit Number: 016990595 Permit Version: 1 Receiving Water: WHINNEY BROOK Status: PRE NRA LEGISLATION WHERE ISSUE DATE < 01-SEP-89 (HISTORIC ONLY) Issue date: - Effective Date: 20-Mar-1985 Revocation Date: -

2.1.9 Records of Water Industry Referrals (potentially harmful discharges to the public sewer) within 500m of the study site:

0

Database searched and no data found.

2.1.10 Records of Planning Hazardous Substance Consents and Enforcements within 500m of the study site:

0

Database searched and no data found.

2.2 Dangerous or Hazardous Sites

Records of COMAH & NIHHS sites within 500m of the study site:

0

Database searched and no data found.

2.3 Environment Agency/Natural Resources Wales Recorded Pollution Incidents

2.3.1 Records of National Incidents Recording System, List 2 within 500m of the study site:

1

The following NIRS List 2 records are represented as points on the Environmental Permits, Incidents and Registers Map:

ID	Distance (m)	Direction	NGR	Details
1	124	E	339970 402320	Incident Date: 21-Oct-2003 Incident Identification: 197444 Pollutant: Oils and Fuel Pollutant Description: Gas and Fuel Oils Water Impact: Category 4 (No Impact) Land Impact: Category 3 (Minor) Air Impact: Category 4 (No Impact)

2.3.2 Records of National Incidents Recording System, List 1 within 500m of the study site:

0

Database searched and no data found.

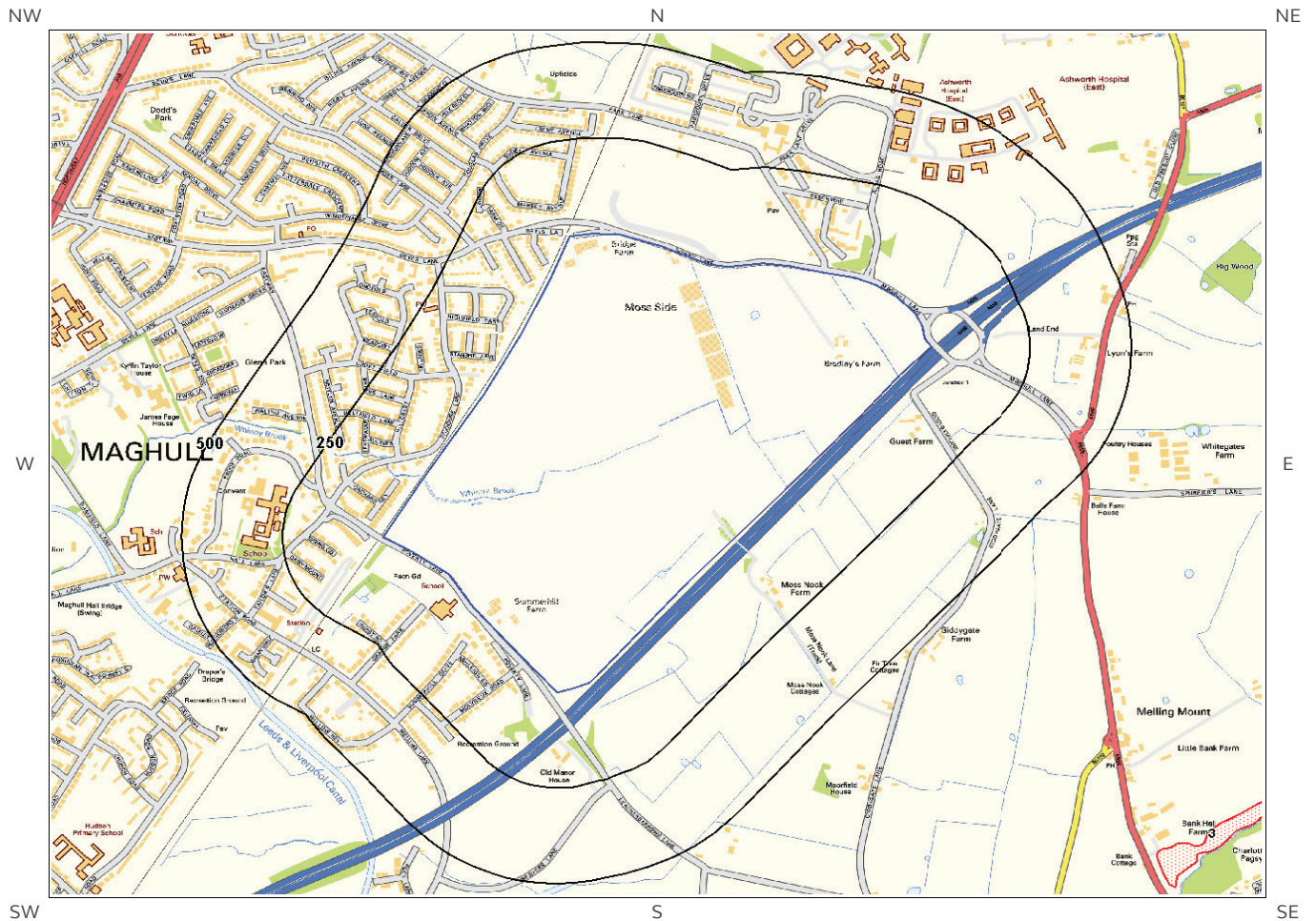
2.4 Sites Determined as Contaminated Land under Part 2A EPA 1990

How many records of sites determined as contaminated land under Section 78R of the Environmental Protection Act 1990 are there within 500m of the study site?

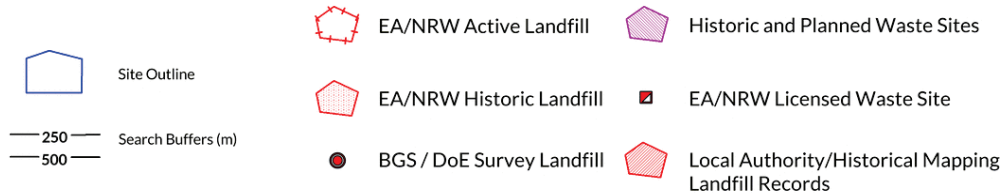
0

Database searched and no data found.

3. Landfill and Other Waste Sites Map



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3. Landfill and Other Waste Sites

3.1 Landfill Sites

3.1.1 Records from Environment Agency/Natural Resources Wales landfill data within 1000m of the study site:

0

Database searched and no data found.

3.1.2 Records of Environment Agency/Natural Resources Wales historic landfill sites within 1500m of the study site:

5

The following landfill records are represented as either points or polygons on the Landfill and Other Waste Sites map:

ID	Distance (m)	Direction	NGR	Details
Not shown	761	SW	338400 400500	Site Address: Rock Lane, Rock Lane, Sefton, Melling, Merseyside Waste Licence: - Site Reference: K1/15/149, GDO 149, 175/03 Waste Type: Inert Environmental Permitting Regulations (Waste) Reference: - Licence Issue: Licence Surrendered: Licence Holder Address: Old Tithebarn Vicarage, 23 Tithebarn Lane, Melling, Liverpool Operator: Mrs D Leatherbarrow Licence Holder: Mrs D Leatherbarrow First Recorded: 01-Aug-1986 Last Recorded: 31-Dec-1987
Not shown	1072	SE	339700 400400	Site Address: Giddygate Lane, Giddygate Lane, Melling, Merseyside Waste Licence: Yes Site Reference: GDO 230, K1/15/230, 145/03 Waste Type: Inert, Industrial Environmental Permitting Regulations (Waste) Reference: - Licence Issue: 03-Aug-1984 Licence Surrendered: 03-Dec-1989 Licence Holder Address: 91-113 Widdicar Lane, Melling, Merseyside Operator: J Armour Licence Holder: J Armour First Recorded: 31-Dec-1988 Last Recorded: 01-Feb-1990
3	1326	SE	340900 401100	Site Address: Bank Hall Farm, Bank Lane, Melling, Ormskirk, Lancashire Waste Licence: Yes Site Reference: 094A/03, GDO 021, 094/03, K1/08/84, K1/15/021, 026/01 Waste Type: Inert, Industrial, Household Environmental Permitting Regulations (Waste) Reference: - Licence Issue: 07-Nov-1980 Licence Surrendered: 31-Dec-1993 Licence Holder Address: Bank Hall Farm, Melling Operator: D J Pope Licence Holder: D J Pope First Recorded: 01-Sep-1980 Last Recorded: 31-Jul-1991

ID	Distance (m)	Direction	NGR	Details
Not shown	1353	SE	340900 401100	Site Address: Bank Hall Farm, Bank Lane, Melling, Ormskirk, Lancashire Waste Licence: Yes Site Reference: 094A/03, GDO 021, 094/03, K1/08/84, K1/15/021, 026/01 Waste Type: Inert, Industrial, Household Environmental Permitting Regulations (Waste) Reference: - Licence Issue: 07-Nov-1980 Licence Surrendered: 31-Dec-1993 Licence Holder Address: Bank Hall Farm, Melling Operator: D J Pope Licence Holder: D J Pope First Recorded: 01-Sep-1980 Last Recorded: 31-Jul-1991
Not shown	1357	SE	340900 401100	Site Address: Bank Hall Farm, Bank Lane, Melling, Ormskirk, Lancashire Waste Licence: Yes Site Reference: 094A/03, GDO 021, 094/03, K1/08/84, K1/15/021, 026/01 Waste Type: Inert, Industrial, Household Environmental Permitting Regulations (Waste) Reference: - Licence Issue: 07-Nov-1980 Licence Surrendered: 31-Dec-1993 Licence Holder Address: Bank Hall Farm, Melling Operator: D J Pope Licence Holder: D J Pope First Recorded: 01-Sep-1980 Last Recorded: 31-Jul-1991

3.1.3 Records of BGS/DoE non-operational landfill sites within 1500m of the study site:

0

Database searched and no data found.

3.1.4 Records of Landfills from Local Authority and Historical Mapping Records within 1500m of the study site:

1

The following landfill records are represented as points or polygons on the Landfill and Other Waste Sites map:

ID	Distance (m)	Direction	NGR	Site Address	Source	Data Type
Not shown	728	N	339358 403251	Refuse Tip	1968 mapping	Polygon

3.2 Other Waste Sites

3.2.1 Records of waste treatment, transfer or disposal sites within 500m of the study site:

0

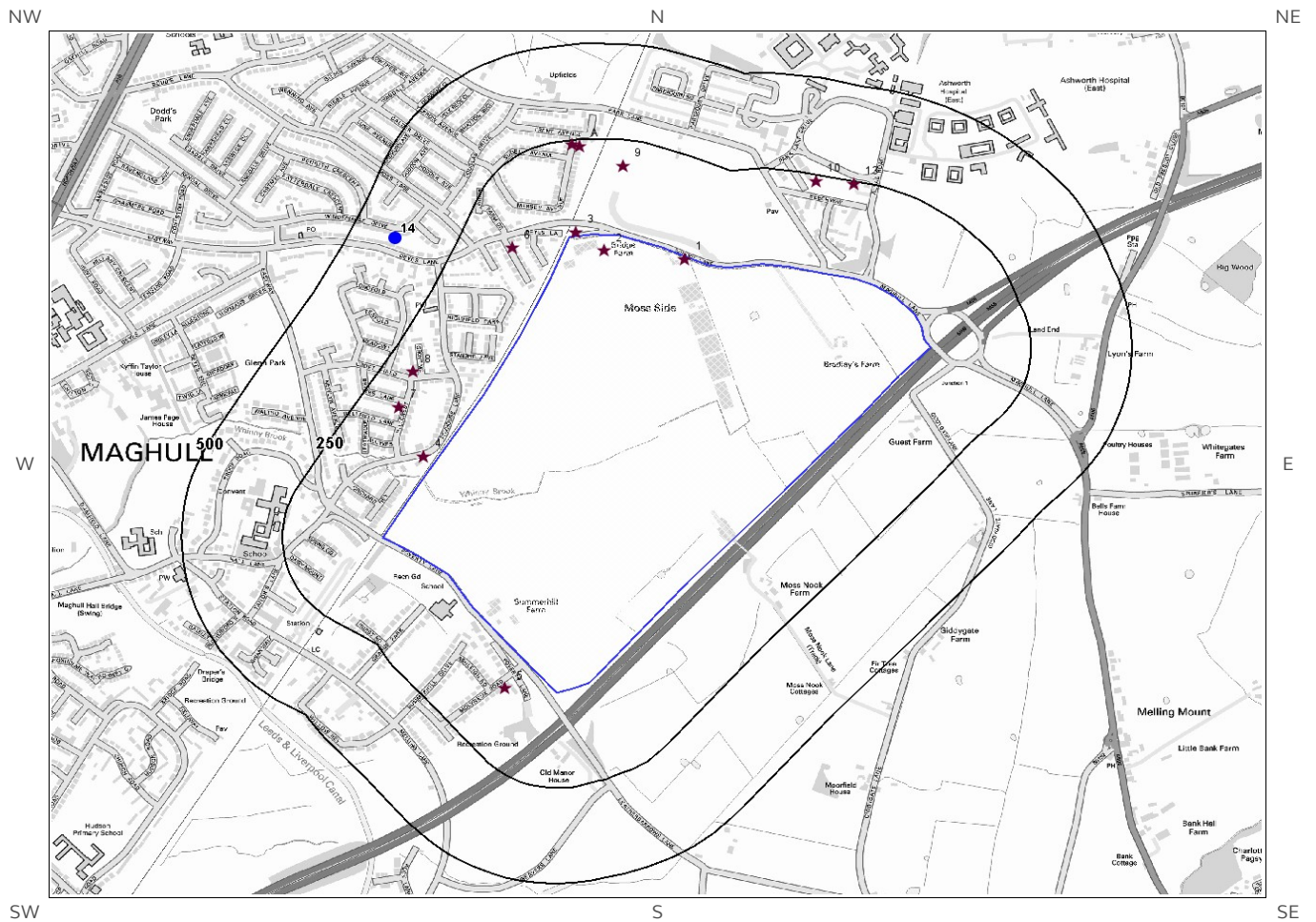
Database searched and no data found.

3.2.2 Records of Environment Agency/Natural Resources Wales licensed waste sites within 1500m of the study site:

0

Database searched and no data found.

4. Current Land Use Map



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Site Outline

★ Current Industrial Sites

— Electricity Transmission Cables

— 250 — Search Buffers (m)
— 500 —

● Petrol & Fuel Sites

— Gas Transmission Pipelines

4. Current Land Uses

4.1 Current Industrial Data

Records of potentially contaminative industrial sites within 250m of the study site:

13

The following records are represented as points on the Current Land Uses map.

ID	Distance (m)	Direction	Company	NGR	Address	Activity	Category
1	0	On Site	Electricity Sub Station	339265 402459	Electricity Sub Station, L31	Electrical Features	Infrastructure and Facilities
2	0	On Site	Anthony Swift Ltd	339066 402481	Anthony Swift Ltd, Bridge Farm, School Lane, Maghull, Liverpool, L31 1HH	Fruit, Flower and Vegetable Growers	Farming
3	13	N	Pumping Station	338994 402530	Pumping Station, L31	Water Pumping Stations	Industrial Features
4	34	NW	Electricity Sub Station	338617 401942	Electricity Sub Station, L31	Electrical Features	Infrastructure and Facilities
5	87	SW	Electricity Sub Station	338818 401335	Electricity Sub Station, L31	Electrical Features	Infrastructure and Facilities
6	121	NW	Electricity Sub Station	338836 402488	Electricity Sub Station, L31	Electrical Features	Infrastructure and Facilities
7	157	NW	P D M Technical Solutions Ltd	338555 402071	P D M Technical Solutions Ltd, 1, Briars Lane, Liverpool, L31 6AR	Civil Engineers	Engineering Services
8	181	NW	Electricity Sub Station	338590 402164	Electricity Sub Station, L31	Electrical Features	Infrastructure and Facilities
9	183	N	Electricity Sub Station	339112 402703	Electricity Sub Station, L31	Electrical Features	Infrastructure and Facilities
10	234	N	Electricity Sub Station	339591 402663	Electricity Sub Station, L31	Electrical Features	Infrastructure and Facilities
11A	235	N	Electricity Sub Station	339003 402755	Electricity Sub Station, L31	Electrical Features	Infrastructure and Facilities
12A	242	N	Electricity Sub Station	338986 402760	Electricity Sub Station, L31	Electrical Features	Infrastructure and Facilities
13	246	N	Electricity Sub Station	339686 402657	Electricity Sub Station, L31	Electrical Features	Infrastructure and Facilities

4.2 Petrol and Fuel Sites

Records of petrol or fuel sites within 500m of the study site:

1

The following petrol or fuel site records provided by Catalist are represented as points on the Current Land Use map:

ID	Distance (m)	Direction	NGR	Company	Address	LPG	Status
14	394	NW	338545 402513	Obsolete	Maghull Service Station, Deyes Lane, Maghull, Liverpool, Merseyside, L31 6DG	Not Applicable	Obsolete

4.3 National Grid High Voltage Underground Electricity Transmission Cables

This dataset identifies the high voltage electricity transmission lines running between generating power plants and electricity substations. The dataset does not include the electricity distribution network (smaller, lower voltage cables distributing power from substations to the local user network). This information has been extracted from databases held by National Grid and is provided for information only with no guarantee as to its completeness or accuracy. National Grid do not offer any warranty as to the accuracy of the available data and are excluded from any liability for any such inaccuracies or errors.

Records of National Grid high voltage underground electricity transmission cables within 500m of the study site:

0

Database searched and no data found.

4.4 National Grid High Pressure Gas Transmission Pipelines

This dataset identifies high-pressure, large diameter pipelines which carry gas between gas terminals, power stations, compressors and storage facilities. The dataset does not include the Local Transmission System (LTS) which supplies gas directly into homes and businesses. This information has been extracted from databases held by National Grid and is provided for information only with no guarantee as to its completeness or accuracy. National Grid do not offer any warranty as to the accuracy of the available data and are excluded from any liability for any such inaccuracies or errors.

Records of National Grid high pressure gas transmission pipelines within 500m of the study site:

0

Database searched and no data found.

5. Geology

5.1 Artificial Ground and Made Ground

Database searched and no data found.

The database has been searched on site, including a 50m buffer.

5.2 Superficial Ground and Drift Geology

The database has been searched on site, including a 50m buffer.

Lex Code	Description	Rock Type
SSA	SHIRDLEY HILL SAND FORMATION	SAND [UNLITHIFIED DEPOSITS CODING SCHEME]
TILLD	TILL, DEVENSIAN	DIAMICTON
SSA	SHIRDLEY HILL SAND FORMATION	SAND [UNLITHIFIED DEPOSITS CODING SCHEME]
SSA	SHIRDLEY HILL SAND FORMATION	SAND [UNLITHIFIED DEPOSITS CODING SCHEME]
TILLD	TILL, DEVENSIAN	DIAMICTON

5.3 Bedrock and Solid Geology

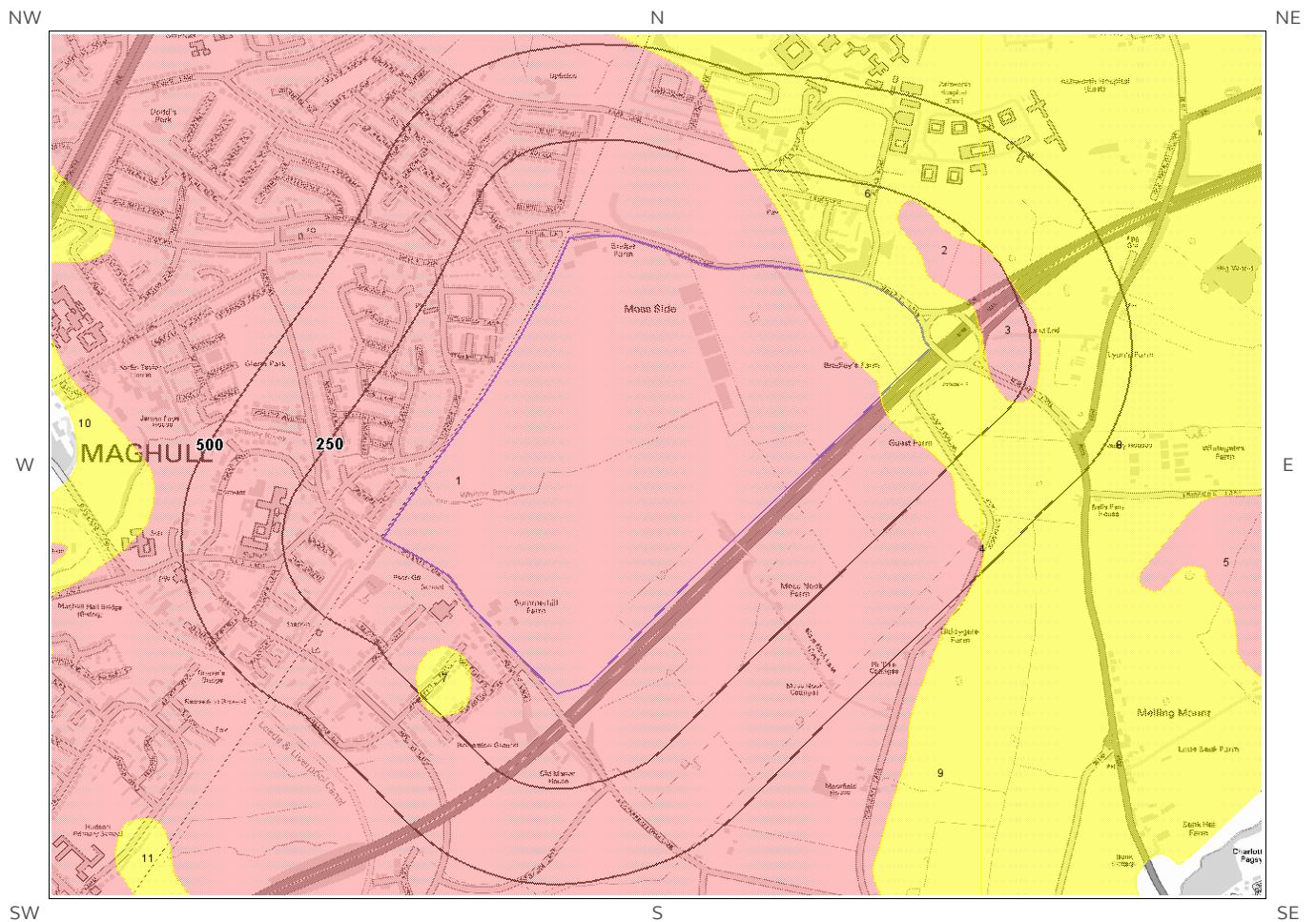
The database has been searched on site, including a 50m buffer.

Lex Code	Description	Rock Type
SSG-SDST	SHERWOOD SANDSTONE GROUP	SANDSTONE
SSG-SDST	SHERWOOD SANDSTONE GROUP	SANDSTONE

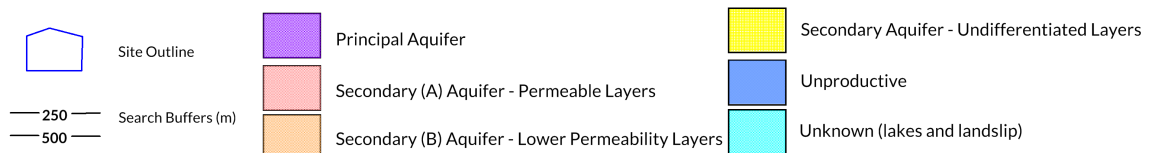
(Derived from the BGS 1:50,000 Digital Geological Map of Great Britain)

6 Hydrogeology and Hydrology

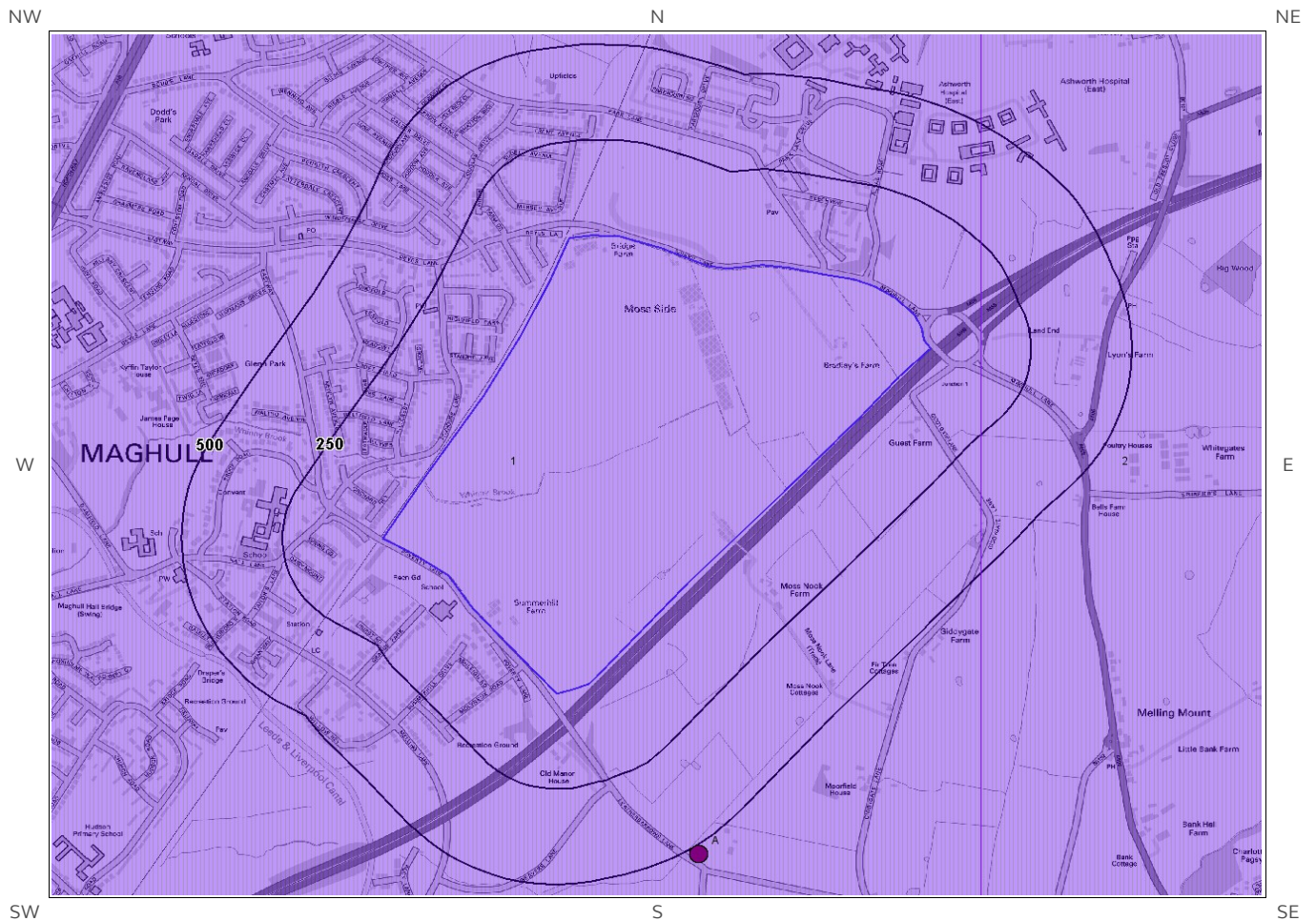
6a. Aquifer Within Superficial Geology



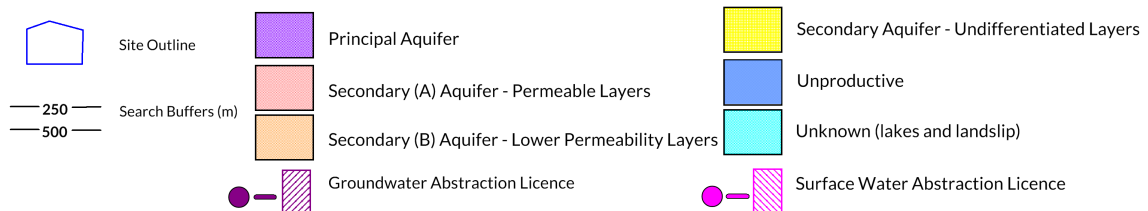
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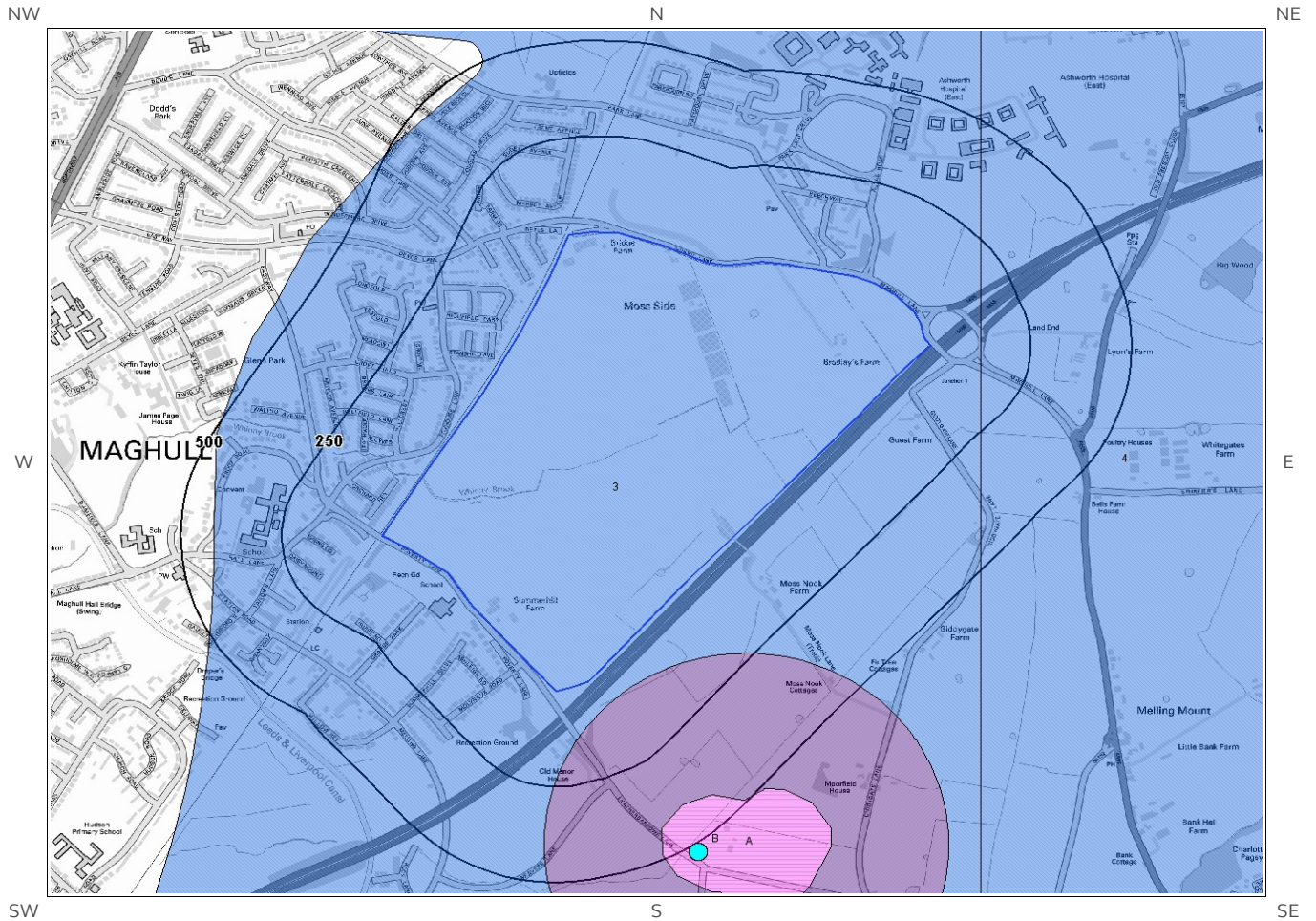
6b. Aquifer Within Bedrock Geology and Abstraction Licenses



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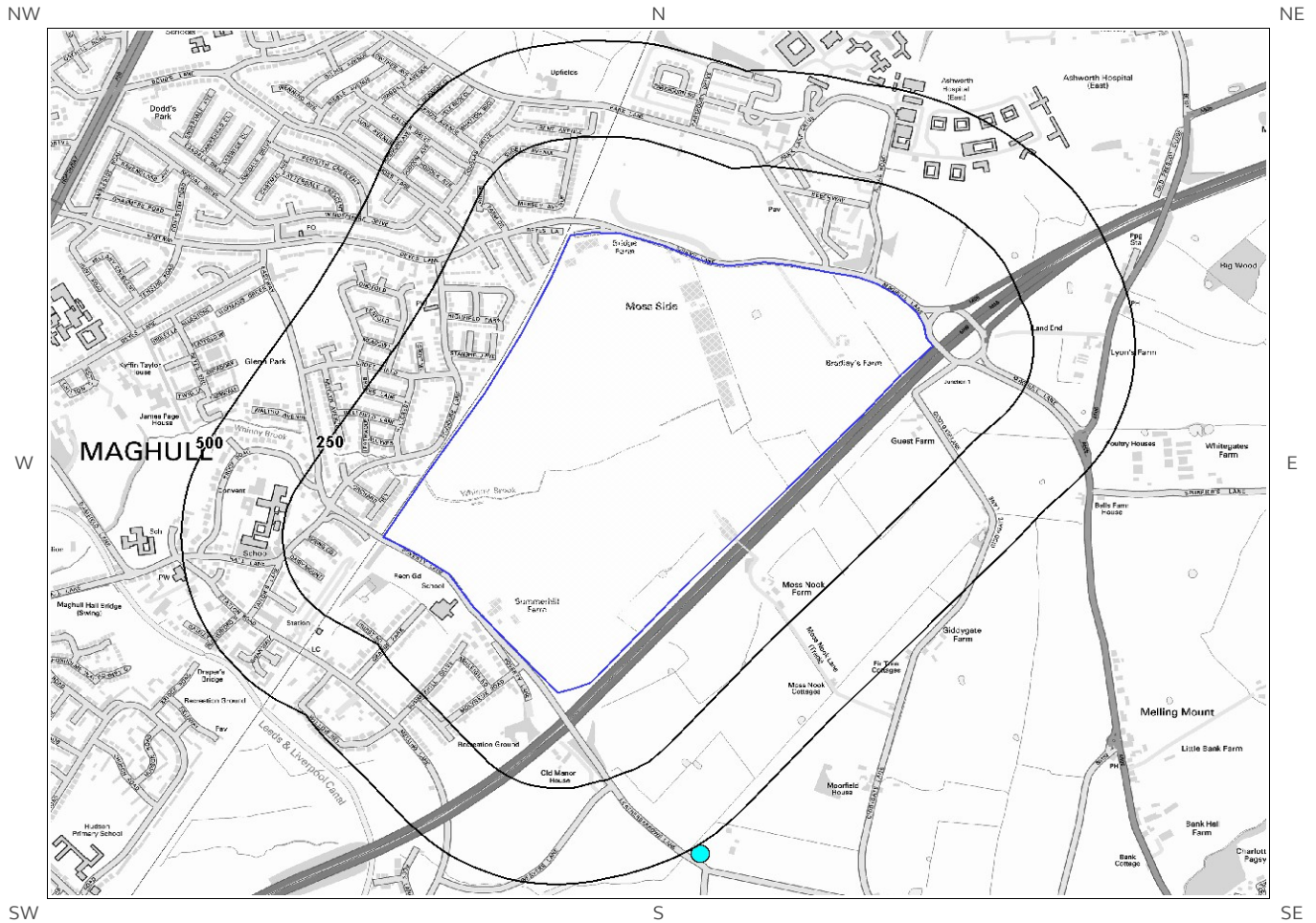


6c. Hydrogeology – Source Protection Zones and Potable Water Abstraction Licenses

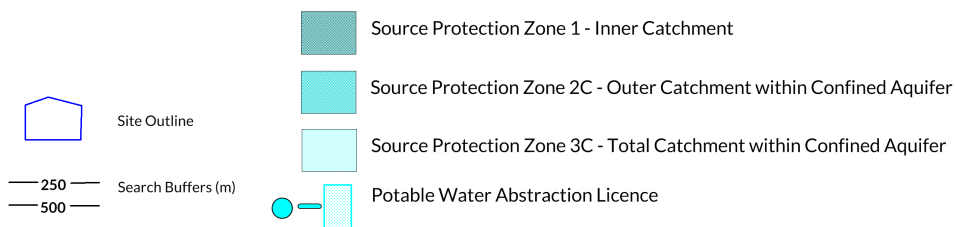


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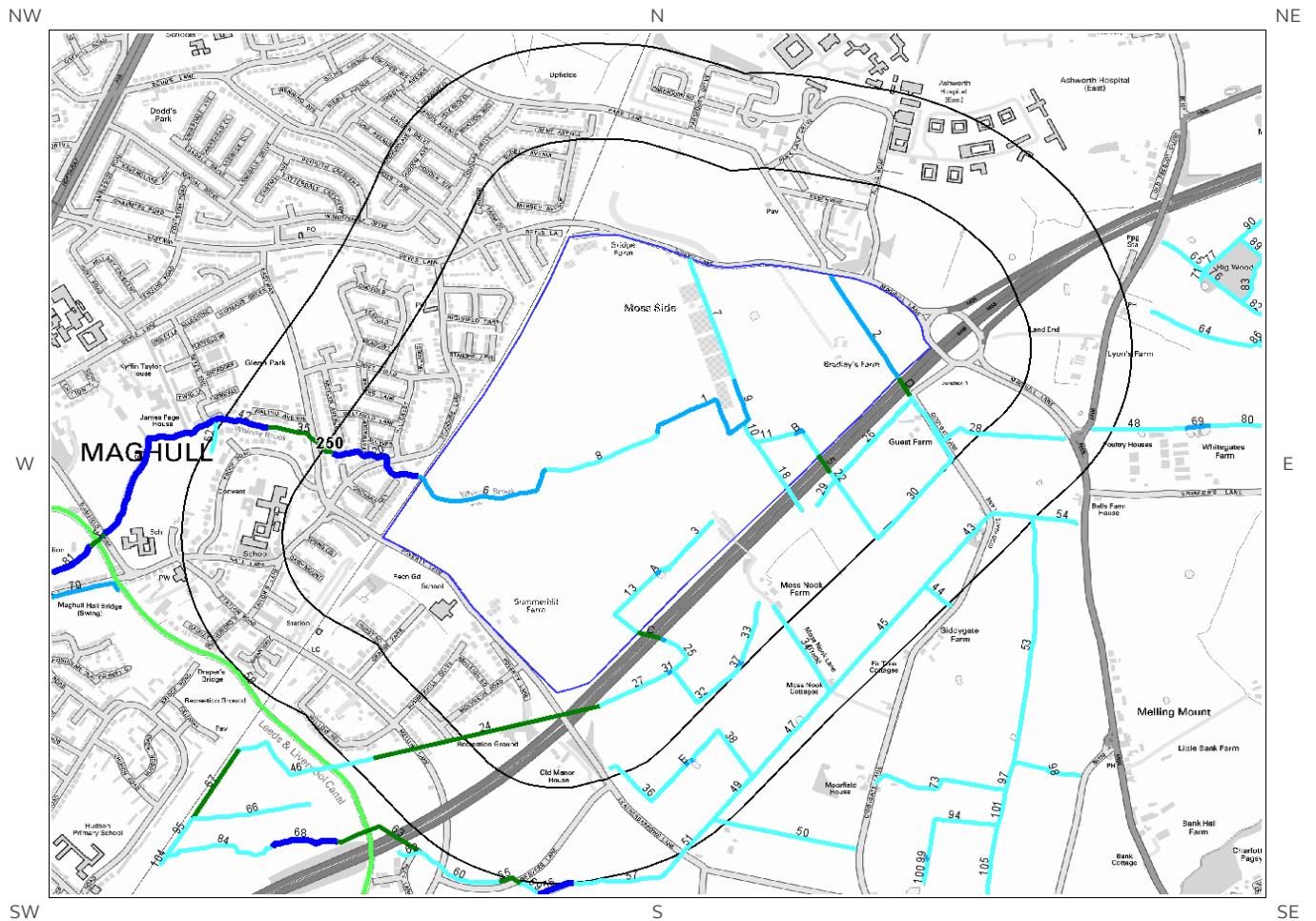
6d. Hydrogeology – Source Protection Zones within confined aquifer



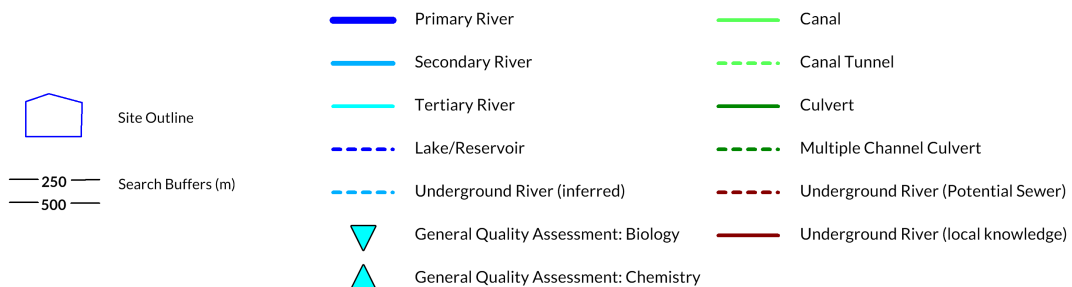
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6e. Hydrology – Detailed River Network and River Quality



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6. Hydrogeology and Hydrology

6.1 Aquifer within Superficial Deposits

Are there records of strata classification within the superficial geology at or in proximity to the property?
Yes

From 1 April 2010, the Environment Agency/Natural Resources Wales's Groundwater Protection Policy has been using aquifer designations consistent with the Water Framework Directive. For further details on the designation and interpretation of this information, please refer to the Groundsure Enviro Insight User Guide.

The following aquifer records are shown on the Aquifer within Superficial Geology Map (6a):

ID	Distance (m)	Direction	Designation	Description
1	0	On Site	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
6	0	On Site	Secondary (undifferentiated)	Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type
2	95	NE	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
7	101	SW	Secondary (undifferentiated)	Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type
8	124	E	Secondary (undifferentiated)	Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type
3	130	E	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
4	435	SE	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
9	493	SE	Secondary (undifferentiated)	Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type

6.2 Aquifer within Bedrock Deposits

Are there records of strata classification within the bedrock geology at or in proximity to the property? Yes

From 1 April 2010, the Environment Agency/Natural Resources Wales's Groundwater Protection Policy has been using aquifer designations consistent with the Water Framework Directive. For further details on the designation and interpretation of this information, please refer to the Groundsure Enviro Insight User Guide.

The following aquifer records are shown on the Aquifer within Bedrock Geology Map (6b):

ID	Distance (m)	Direction	Designation	Description
1	0	On Site	Principal	Geology of high intergranular and/or fracture permeability, usually providing a high level of water storage and may support water supply/river base flow on a strategic scale. Generally principal aquifers were previously major aquifers
2	124	E	Principal	Geology of high intergranular and/or fracture permeability, usually providing a high level of water storage and may support water supply/river base flow on a strategic scale. Generally principal aquifers were previously major aquifers

6.3 Groundwater Abstraction Licences

Are there any Groundwater Abstraction Licences within 2000m of the study site? Yes

The following Abstraction Licences records are represented as points, lines and regions on the Aquifer within Bedrock Geology Map (6b):

ID	Distance (m)	Direction	NGR	Details
3A	523	SE	339300 400900	Status: Historical Licence No: 2569031017 Details: Potable Water Supply - Direct Direct Source: Ground Water - North West Region Point: Boreholes (4) At Melling Pumping Station, Merseyside Data Type: Point Name: UNITED UTILITIES WATER PLC Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: 1600 Original Start Date: 15/3/1966 Expiry Date: - Issue No: 100 Version Start Date: 5/10/1995 Version End Date:
4A	523	SE	339300 400900	Status: Historical Licence No: 2569031017 Details: Potable Water Supply - Direct Direct Source: Ground Water - North West Region Point: Boreholes (4) At Melling Pumping Station, Merseyside Data Type: Point Name: UNITED UTILITIES WATER LTD Annual Volume (m³): 3573156 Max Daily Volume (m³): 13000 Original Application No: 1600 Original Start Date: 15/3/1966 Expiry Date: - Issue No: 100 Version Start Date: 5/10/1995 Version End Date:
5A	523	SE	339300 400900	Status: Historical Licence No: 2569031017 Details: Potable Water Supply - Direct Direct Source: Ground Water - North West Region Point: "boreholes (4) At Melling Pumping Station, Merseyside" Data Type: Point Name: UNITED UTILITIES WATER PLC Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: 1600 Original Start Date: 15/3/1966 Expiry Date: - Issue No: 100 Version Start Date: 5/10/1995 Version End Date:

ID	Distance (m)	Direction	NGR	Details
Not shown	1775	NE	341060 403600	Status: Historical Licence No: 2569031115 Details: Spray Irrigation - Direct Direct Source: Ground Water - North West Region Point: Underground Strata At Bickerstaffe Data Type: Point Name: MALLINSON Annual Volume (m³): 26579.13 Max Daily Volume (m³): 118.15 Original Application No: 8506 Original Start Date: 21/2/1996 Expiry Date: - Issue No: 100 Version Start Date: 21/2/1996 Version End Date:
Not shown	1775	NE	341060 403600	Status: Historical Licence No: 2569031115 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Household Direct Source: Ground Water - North West Region Point: Underground Strata At Bickerstaffe Data Type: Point Name: MALLINSON Annual Volume (m³): 26579.13 Max Daily Volume (m³): 118.15 Original Application No: 8506 Original Start Date: 21/2/1996 Expiry Date: - Issue No: 100 Version Start Date: 21/2/1996 Version End Date:
Not shown	1812	E	341610 401700	Status: Historical Licence No: 2569031125 Details: Spray Irrigation - Direct Direct Source: Ground Water - North West Region Point: Borehole At Simonswood, Ormskirk Data Type: Point Name: PREMIER TURF COMPANY Annual Volume (m³): 15000 Max Daily Volume (m³): 180 Original Application No: 8630 Original Start Date: 6/8/1998 Expiry Date: - Issue No: 100 Version Start Date: 1/4/2006 Version End Date:
Not shown	1812	E	341610 401700	Status: Historical Licence No: 2569031125 Details: Spray Irrigation - Direct Direct Source: Ground Water - North West Region Point: "borehole At Simonswood, Ormskirk" Data Type: Point Name: PREMIER TURF COMPANY Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: 8630 Original Start Date: - Expiry Date: - Issue No: 100 Version Start Date: 6/8/1998 Version End Date:

6.4 Surface Water Abstraction Licences

Are there any Surface Water Abstraction Licences within 2000m of the study site? Yes

The following Surface Water Abstraction Licences records are represented as points, lines and regions on the Aquifer within Bedrock Geology Map (6b):

ID	Distance (m)	Direction	NGR	Details
Not shown	880	N	338500 404200	Status: Historical Licence No: 2569031052 Details: Spray Irrigation - Direct Direct Source: "surface, Non-tidal - North West Region" Point: "suddell Brk At Highway Farm,lydiate,merseyside" Data Type: Line Name: J R HARRISON & SONS Annual Volume (m³): - Max Daily Volume (m³): - Application No: 2572 Original Start Date: 9/4/1981 Expiry Date: - Issue No: 100 Version Start Date: 9/4/1981 Version End Date:
Not shown	880	N	338500 404200	Status: Historical Licence No: 2569031052 Details: Spray Irrigation - Direct Direct Source: Surface, Non-tidal - North West Region Point: Suddell Brk At Highway Farm,lydiate,merseyside Data Type: Line Name: J R HARRISON & SONS Annual Volume (m³): - Max Daily Volume (m³): - Application No: 2572 Original Start Date: 9/4/1981 Expiry Date: - Issue No: 100 Version Start Date: 9/4/1981 Version End Date:

ID	Distance (m)	Direction	NGR	Details	
Not shown	1396	S	338400 400000	Status: Historical Licence No: 2569031094 Details: Spray Irrigation - Direct Direct Source: Surface, Non-tidal - North West Region Point: Leeds & Liverpool Canal At Melling Data Type: Line Name: BRITISH WATERWAYS BOARD	Annual Volume (m³): - Max Daily Volume (m³): - Application No: 2861 Original Start Date: 20/9/1991 Expiry Date: - Issue No: 100 Version Start Date: 20/9/1991 Version End Date:
Not shown	1511	N	338700 404000	Status: Historical Licence No: 2569031087 Details: Transfer between sources Direct Source: Surface, Non-tidal - North West Region Point: Sudell Brk At Aughton, Ormskirk Data Type: Line Name: TAYLOR	Annual Volume (m³): - Max Daily Volume (m³): - Application No: 2709 Original Start Date: 11/5/1987 Expiry Date: - Issue No: 100 Version Start Date: 11/5/1987 Version End Date:
Not shown	1511	N	338700 404000	Status: Historical Licence No: 2569031087 Details: Transfer between sources Direct Source: "surface, Non-tidal - North West Region" Point: "sudell Brk At Aughton, Ormskirk" Data Type: Line Name: TAYLOR	Annual Volume (m³): - Max Daily Volume (m³): - Application No: 2709 Original Start Date: 11/5/1987 Expiry Date: - Issue No: 100 Version Start Date: 11/5/1987 Version End Date:
Not shown	1511	N	338700 404000	Status: Active Licence No: 2569031087 Details: Transfer Between Sources (Pre Water Act 2003) Direct Source: Surface, Non-tidal - North West Region Point: Sudell Brook At Aughton Ormskirk Data Type: Line Name: TAYLOR	Annual Volume (m³): 4546 Max Daily Volume (m³): 227.3 Application No: 2709 Original Start Date: 11/5/1987 Expiry Date: - Issue No: 100 Version Start Date: 11/5/1987 Version End Date:
Not shown	1778	SW	337000 400800	Status: Historical Licence No: 2569031063 Details: Spray Irrigation - Direct Direct Source: Surface, Non-tidal - North West Region Point: R Alt At Maghull, Liverpool, Merseyside Data Type: Line Name: CAUNCE	Annual Volume (m³): - Max Daily Volume (m³): - Application No: 2645 Original Start Date: 11/5/1983 Expiry Date: - Issue No: 100 Version Start Date: 11/5/1983 Version End Date:
Not shown	1778	SW	337000 400800	Status: Historical Licence No: 2569031063 Details: Spray Irrigation - Direct Direct Source: "surface, Non-tidal - North West Region" Point: "r Alt At Maghull, Liverpool, Merseyside" Data Type: Line Name: CAUNCE	Annual Volume (m³): - Max Daily Volume (m³): - Application No: 2645 Original Start Date: 11/5/1983 Expiry Date: - Issue No: 100 Version Start Date: 11/5/1983 Version End Date:
Not shown	1778	SW	337000 400800	Status: Historical Licence No: 2569031063 Details: Spray Irrigation - Direct Direct Source: Surface, Non-tidal - North West Region Point: River Alt At Maghull Liverpool Merseyside Data Type: Line Name: CAUNCE	Annual Volume (m³): - Max Daily Volume (m³): - Application No: 2645 Original Start Date: 11/5/1983 Expiry Date: - Issue No: 100 Version Start Date: 11/5/1983 Version End Date:
Not shown	1778	SW	337000 400800	Status: Active Licence No: 2569031063 Details: Spray Irrigation - Direct Direct Source: Surface, Non-tidal - North West Region Point: River Alt At Maghull Liverpool Merseyside Data Type: Line Name: CAUNCE	Annual Volume (m³): 40914 Max Daily Volume (m³): 1091.04 Application No: 2645 Original Start Date: 11/5/1983 Expiry Date: - Issue No: 100 Version Start Date: 11/5/1983 Version End Date:

ID	Distance (m)	Direction	NGR	Details
Not shown	1813	SW	337400 400300	Status: Historical Licence No: 2569031063 Details: Spray Irrigation - Direct Direct Source: "surface, Non-tidal - North West Region" Point: "r Alt At Maghull, Liverpool, Merseyside" Data Type: Line Name: CAUNCE Annual Volume (m³): - Max Daily Volume (m³): - Application No: 2645 Original Start Date: 11/5/1983 Expiry Date: - Issue No: 100 Version Start Date: 11/5/1983 Version End Date:
Not shown	1813	SW	337400 400300	Status: Historical Licence No: 2569031063 Details: Spray Irrigation - Direct Direct Source: Surface, Non-tidal - North West Region Point: R Alt At Maghull, Liverpool, Merseyside Data Type: Line Name: CAUNCE Annual Volume (m³): - Max Daily Volume (m³): - Application No: 2645 Original Start Date: 11/5/1983 Expiry Date: - Issue No: 100 Version Start Date: 11/5/1983 Version End Date:
Not shown	1813	SW	337400 400300	Status: Active Licence No: 2569031063 Details: Spray Irrigation - Direct Direct Source: Surface, Non-tidal - North West Region Point: River Alt At Maghull Liverpool Merseyside Data Type: Line Name: CAUNCE Annual Volume (m³): 40914 Max Daily Volume (m³): 1091.04 Application No: 2645 Original Start Date: 11/5/1983 Expiry Date: - Issue No: 100 Version Start Date: 11/5/1983 Version End Date:
Not shown	1820	NW	337800 403900	Status: Historical Licence No: 2569031054 Details: Spray Irrigation - Direct Direct Source: Surface, Non-tidal - North West Region Point: Ponds (2) At Moss Lane Farm,lydiate,merseyside Data Type: Point Name: J R HARRISON & SONS Annual Volume (m³): - Max Daily Volume (m³): - Application No: 2572 Original Start Date: 9/4/1981 Expiry Date: - Issue No: 100 Version Start Date: 9/4/1981 Version End Date:
Not shown	1820	NW	337800 403900	Status: Historical Licence No: 2569031054 Details: Spray Irrigation - Direct Direct Source: "surface, Non-tidal - North West Region" Point: "ponds (2) At Moss Lane Farm,lydiate,merseyside" Data Type: Point Name: J R HARRISON & SONS Annual Volume (m³): - Max Daily Volume (m³): - Application No: 2572 Original Start Date: 9/4/1981 Expiry Date: - Issue No: 100 Version Start Date: 9/4/1981 Version End Date:
Not shown	1836	NW	337900 404000	Status: Historical Licence No: 2569031054 Details: Spray Irrigation - Direct Direct Source: "surface, Non-tidal - North West Region" Point: "ponds (2) At Moss Lane Farm,lydiate,merseyside" Data Type: Point Name: J R HARRISON & SONS Annual Volume (m³): - Max Daily Volume (m³): - Application No: 2572 Original Start Date: 9/4/1981 Expiry Date: - Issue No: 100 Version Start Date: 9/4/1981 Version End Date:
Not shown	1836	NW	337900 404000	Status: Historical Licence No: 2569031054 Details: Spray Irrigation - Direct Direct Source: Surface, Non-tidal - North West Region Point: Ponds (2) At Moss Lane Farm,lydiate,merseyside Data Type: Point Name: J R HARRISON & SONS Annual Volume (m³): - Max Daily Volume (m³): - Application No: 2572 Original Start Date: 9/4/1981 Expiry Date: - Issue No: 100 Version Start Date: 9/4/1981 Version End Date:

ID	Distance (m)	Direction	NGR	Details
Not shown	1948	NW	338200 404300	Status: Historical Licence No: 2569031052 Details: Spray Irrigation - Direct Direct Source: Surface, Non-tidal - North West Region Point: Suddell Brk At Highway Farm,lydiate,merseyside \$219 Data Type: Point Name: J R HARRISON & SONS Annual Volume (m³): - Max Daily Volume (m³): - Application No: 2572 Original Start Date: 9/4/1981 Expiry Date: - Issue No: 100 Version Start Date: 9/4/1981 Version End Date:
Not shown	1948	NW	338200 404300	Status: Historical Licence No: 2569031052 Details: Spray Irrigation - Direct Direct Source: "surface, Non-tidal - North West Region" Point: "suddell Brk At Highway Farm,lydiate,merseyside \$219" Data Type: Point Name: J R HARRISON & SONS Annual Volume (m³): - Max Daily Volume (m³): - Application No: 2572 Original Start Date: 9/4/1981 Expiry Date: - Issue No: 100 Version Start Date: 9/4/1981 Version End Date:

6.5 Potable Water Abstraction Licences

Are there any Potable Water Abstraction Licences within 2000m of the study site?

Yes

The following Potable Water Abstraction Licences records are represented as points, lines and regions on the SPZ and Potable Water Abstraction Licences Map (6c):

ID	Distance (m)	Direction	NGR	Details
5B	523	SE	339300 400900	Status: Historical Licence No: 2569031017 Details: Potable Water Supply - Direct Direct Source: Ground Water - North West Region Point: "boreholes (4) At Melling Pumping Station,merseyside" Data Type: Point Name: UNITED UTILITIES WATER PLC Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: 1600 Original Start Date: 15/3/1966 Expiry Date: - Issue No: 100 Version Start Date: Version End Date:
6B	523	SE	339300 400900	Status: Historical Licence No: 2569031017 Details: Potable Water Supply - Direct Direct Source: Ground Water - North West Region Point: Boreholes (4) At Melling Pumping Station,merseyside Data Type: Point Name: UNITED UTILITIES WATER PLC Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: 1600 Original Start Date: 15/3/1966 Expiry Date: - Issue No: 100 Version Start Date: Version End Date:
7B	523	SE	339300 400900	Status: Active Licence No: 2569031017 Details: Potable Water Supply - Direct Direct Source: Ground Water - North West Region Point: Boreholes (4) At Melling Pumping Station, Merseyside Data Type: Point Name: UNITED UTILITIES WATER LTD Annual Volume (m³): 3573156 Max Daily Volume (m³): 13000 Original Application No: 1600 Original Start Date: 15/3/1966 Expiry Date: - Issue No: 100 Version Start Date: Version End Date:

ID	Distance (m)	Direction	NGR	Details	
Not shown	1775	NE	341060 403600	Status: Active Licence No: 2569031115 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Household Direct Source: Ground Water - North West Region Point: Underground Strata At Bickerstaffe Data Type: Point Name: MALLINSON	Annual Volume (m³): 26579.13 Max Daily Volume (m³): 118.15 Original Application No: 8506 Original Start Date: 21/2/1996 Expiry Date: - Issue No: 100 Version Start Date: Version End Date:

6.6 Source Protection Zones

Are there any Source Protection Zones within 500m of the study site?

Yes

The following Source Protection Zones records are represented on the SPZ and Potable Water Abstraction Map (6c):

ID	Distance (m)	Direction	Zone	Description
3	0	On Site	3	Total catchment
2A	77	SE	2	Outer catchment
4	124	E	3	Total catchment
1A	397	SE	1	Inner catchment

6.7 Source Protection Zones within Confined Aquifer

Are there any Source Protection Zones within the Confined Aquifer within 500m of the study site?

No

Historically, Source Protection Zone maps have been focused on regulation of activities which occur at or near the ground surface, such as prevention of point source pollution and bacterial contamination of water supplies. Sources in confined aquifers were often considered to be protected from these surface pressures due to the presence of a low permeability confining layer (e.g. glacial till, clay). The increased interest in subsurface activities such as onshore oil and gas exploration, ground source heating and cooling requires protection zones for confined sources to be marked on SPZ maps where this has not already been done.

Database searched and no data found.

6.8 Groundwater Vulnerability and Soil Leaching Potential

Is there any Environment Agency/Natural Resources Wales information on groundwater vulnerability and soil leaching potential within 500m of the study site? Yes

Distance (m)	Direction	Classification	Soil Vulnerability Category	Description
0	On Site	Major Aquifer/High Leaching Potential	H1	Soils which readily transmit liquid discharges because they are shallow or susceptible to rapid flow directly to rock, gravel or groundwater.
0	On Site	Major Aquifer/High Leaching Potential	HU	Soil information for urban areas and restored mineral workings. These soils are therefore assumed to be highly permeable in the absence of site-specific information.
0	On Site	Minor Aquifer/High Leaching Potential	H1	Soils which readily transmit liquid discharges because they are shallow or susceptible to rapid flow directly to rock, gravel or groundwater.
0	On Site	Minor Aquifer/High Leaching Potential	HU	Soil information for urban areas and restored mineral workings. These soils are therefore assumed to be highly permeable in the absence of site-specific information.
0	On Site	Major Aquifer/Low Leaching Potential	L	Soils in which pollutants are unlikely to penetrate the soil layer because either water movement is largely horizontal, or they have the ability to attenuate diffuse pollutants.
1	N	Major Aquifer/High Leaching Potential	HU	Soil information for urban areas and restored mineral workings. These soils are therefore assumed to be highly permeable in the absence of site-specific information.
124	E	Major Aquifer/Low Leaching Potential	L	Soils in which pollutants are unlikely to penetrate the soil layer because either water movement is largely horizontal, or they have the ability to attenuate diffuse pollutants.
336	N	Major Aquifer/High Leaching Potential	H1	Soils which readily transmit liquid discharges because they are shallow or susceptible to rapid flow directly to rock, gravel or groundwater.
386	N	Minor Aquifer/High Leaching Potential	H1	Soils which readily transmit liquid discharges because they are shallow or susceptible to rapid flow directly to rock, gravel or groundwater.
401	SW	Major Aquifer/Low Leaching Potential	L	Soils in which pollutants are unlikely to penetrate the soil layer because either water movement is largely horizontal, or they have the ability to attenuate diffuse pollutants.

6.9 River Quality

Is there any Environment Agency/Natural Resources Wales information on river quality within 1500m of the study site? No

6.9.1 Biological Quality:

Database searched and no data found.

6.9.2 Chemical Quality:

Database searched and no data found.

6.10 Detailed River Network

Are there any Detailed River Network entries within 500m of the study site? Yes

The following Detailed River Network records are represented on the Hydrology Map (6e):

ID	Distance (m)	Direction	Details	
1	0	On Site	River Name: Whinny Brook Welsh River Name: - Alternative Name: -	River Type: Secondary River Main River Status: Currently Undefined
2	0	On Site	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Secondary River Main River Status: Currently Undefined
3	0	On Site	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
4C	0	On Site	River Name: - Welsh River Name: - Alternative Name: -	River Type: Culvert Main River Status: Currently Undefined
5	0	On Site	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Culvert Main River Status: Currently Undefined
6	0	On Site	River Name: Whinny Brook Welsh River Name: - Alternative Name: -	River Type: Secondary River Main River Status: Currently Undefined
7	0	On Site	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
8	0	On Site	River Name: Whinny Brook Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
9	0	On Site	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Secondary River Main River Status: Currently Undefined
10	0	On Site	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
11	0	On Site	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
12A	0	On Site	River Name: - Welsh River Name: - Alternative Name: -	River Type: Secondary River Main River Status: Currently Undefined

ID	Distance (m)	Direction	Details	
13	0	On Site	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
14A	0	On Site	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
15A	0	On Site	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
16B	0	On Site	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Secondary River Main River Status: Currently Undefined
17B	0	On Site	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
18	0	On Site	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
19D	2	SE	River Name: - Welsh River Name: - Alternative Name: -	River Type: Culvert Main River Status: Currently Undefined
20	14	NW	River Name: Whinny Brook Welsh River Name: - Alternative Name: -	River Type: Primary River Main River Status: Currently Undefined
21C	50	SE	River Name: - Welsh River Name: - Alternative Name: -	River Type: Secondary River Main River Status: Currently Undefined
22	51	SE	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
23D	56	SE	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
24	59	S	River Name: - Welsh River Name: - Alternative Name: -	River Type: Culvert Main River Status: Currently Undefined
25	63	SE	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
26	65	SE	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
27	66	SE	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
28	67	SE	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
29	73	SE	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
30	73	SE	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
31	125	SE	River Name: - Welsh River Name: - Alternative Name: -	River Type: Secondary River Main River Status: Currently Undefined

ID	Distance (m)	Direction	Details	
32	130	SE	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
33	161	SE	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
34	191	SE	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
35	225	NW	River Name: Whinny Brook Welsh River Name: - Alternative Name: -	River Type: Culvert Main River Status: Currently Undefined
36	226	S	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
37	238	SE	River Name: - Welsh River Name: - Alternative Name: -	River Type: Secondary River Main River Status: Currently Undefined
38	318	SE	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
39E	321	SE	River Name: - Welsh River Name: - Alternative Name: -	River Type: Secondary River Main River Status: Currently Undefined
40E	321	SE	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
41E	323	SE	River Name: - Welsh River Name: - Alternative Name: -	River Type: Secondary River Main River Status: Currently Undefined
42	397	NW	River Name: Whinny Brook Welsh River Name: - Alternative Name: -	River Type: Primary River Main River Status: Currently Undefined
43	411	SE	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
44	426	SE	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
45	426	SE	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
46	451	SW	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
47	452	SE	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
48	454	SE	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
49	464	SE	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
50	473	SE	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined

ID	Distance (m)	Direction	Details	
51	473	SE	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
52	480	NW	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
53	495	SE	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
54	495	SE	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
55	495	S	River Name: Melling Watercourse Welsh River Name: - Alternative Name: -	River Type: Culvert Main River Status: Currently Undefined
56	499	S	River Name: - Welsh River Name: - Alternative Name: -	River Type: Primary River Main River Status: Currently Undefined
57	500	S	River Name: Drain Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined

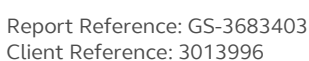
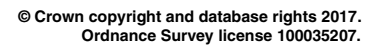
6.11 Surface Water Features

Are there any surface water features within 250m of the study site?

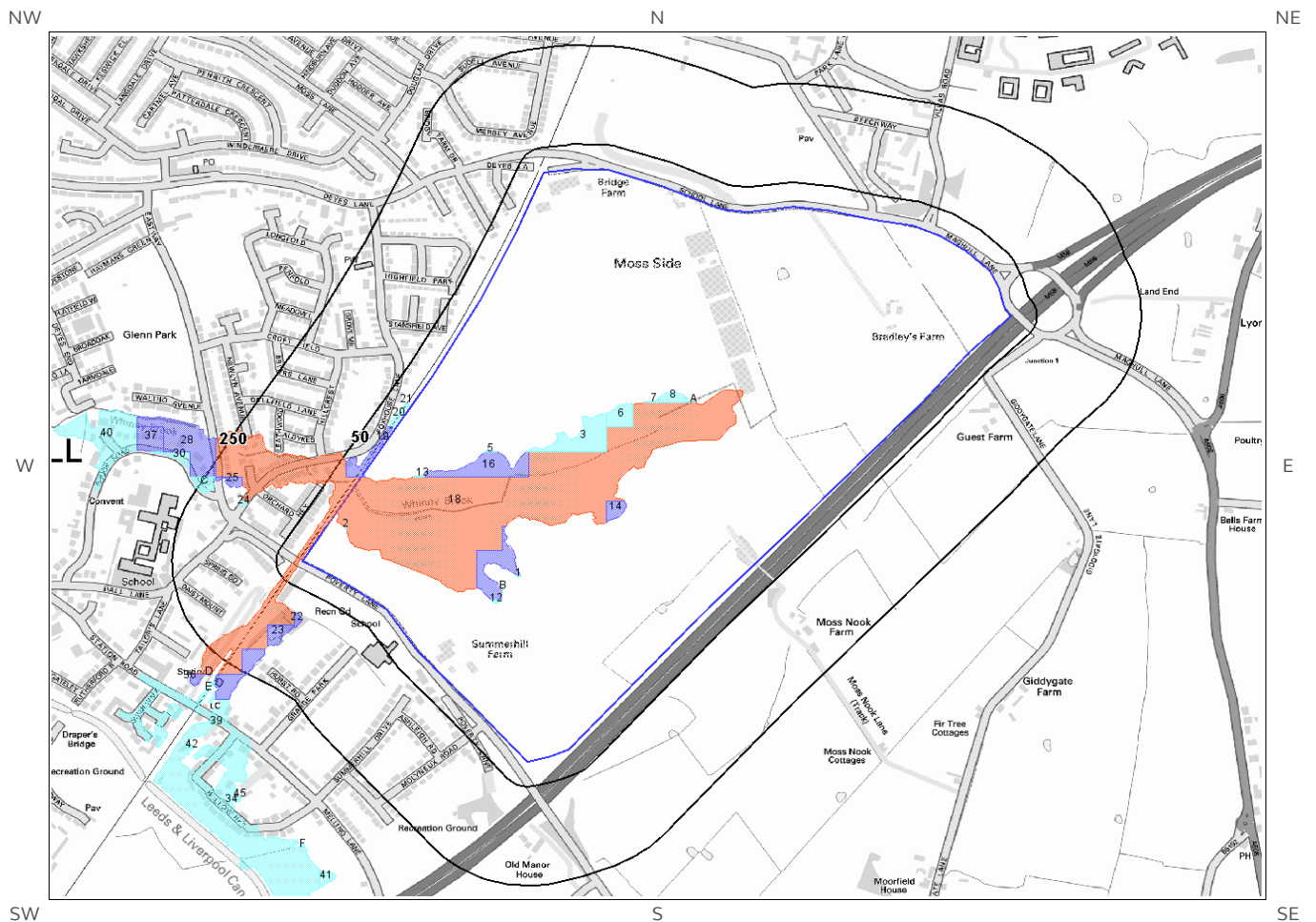
Yes

The following surface water records are not represented on mapping:

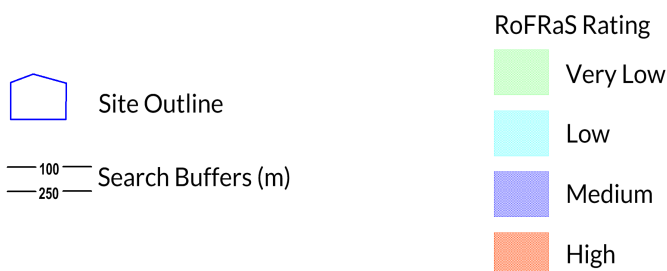
Distance (m)	Direction
0	On Site
0	On Site
0	On Site
0	On Site
0	On Site
0	On Site
0	On Site
0	On Site
0	On Site
0	On Site
0	On Site
0	On Site
0	On Site
14	NW
47	SE
51	SE
56	SE
63	SE
66	SE
67	SE
67	SE
71	SE
73	SE
77	SE
92	SW
93	SW
100	NE
104	NW
106	SW
110	SE
112	SE
114	SW
114	SW
131	SE
154	SE
161	SE
164	SW
164	SW
191	SE
209	SW
227	S
249	SE



7b. Environment Agency/Natural Resources Wales Risk of Flooding from Rivers and the Sea (RoFRaS) Map



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7 Flooding

7.1 River and Coastal Zone 2 Flooding

Is the site within 250m of an Environment Agency/Natural Resources Wales Zone 2 floodplain? Yes

Environment Agency/Natural Resources Wales Zone 2 floodplains estimate the annual probability of flooding as between 1 in 1000 (0.1%) and 1 in 100 (1%) from rivers and between 1 in 1000 (0.1%) and 1 in 200 (0.5%) from the sea. Any relevant data is represented on Map 7a – Flood Map for Planning:

ID	Distance (m)	Direction	Update	Type
1	0	On Site	01-Feb-2017	Zone 2 - (Fluvial /Tidal Models)
2	89	NW	01-Feb-2017	Zone 2 - (Fluvial /Tidal Models)

7.2 River and Coastal Zone 3 Flooding

Is the site within 250m of an Environment Agency/Natural Resources Wales Zone 3 floodplain? Yes

Zone 3 shows the extent of a river flood with a 1 in 100 (1%) or greater chance of occurring in any year or a sea flood with a 1 in 200 (0.5%) or greater chance of occurring in any year. Any relevant data is represented on Map 7a – Flood Map for Planning.

ID	Distance (m)	Direction	Update	Type
1	0	On Site	01-Feb-2017	Zone 3 - (Fluvial Models)

7.3 Risk of Flooding from Rivers and the Sea (RoFRaS) Flood Rating

What is the highest risk of flooding onsite? High

The Environment Agency/Natural Resources Wales RoFRaS database provides an indication of river and coastal flood risk at a national level on a 50m grid with the flood rating at the centre of the grid calculated and given above. The data considers the probability that the flood defences will overtop or breach by considering their location, type, condition and standard of protection.

RoFRaS data for the study site indicates the property is in an area with a High (1 in 30 or greater) chance of flooding in any given year.

Any relevant data within 250m is represented on the RoFRaS Flood map. Data to 50m is reported in the table below.

ID	Distance (m)	Direction	RoFRaS flood Risk
----	--------------	-----------	-------------------

1	0.0	On Site	Low
2	0.0	On Site	Low
3	0.0	On Site	Low
4B	0.0	On Site	Low
5	0.0	On Site	Low
6	0.0	On Site	Low
7	0.0	On Site	Low
8	0.0	On Site	Low
9A	0.0	On Site	Low
10A	0.0	On Site	Low
11B	0.0	On Site	Low
12	0.0	On Site	Low
13	0.0	On Site	Low
14	0.0	On Site	Medium
15	0.0	On Site	Medium
16	0.0	On Site	Medium
17	0.0	On Site	Medium
18	0.0	On Site	High
19	4.0	NW	Medium
20	5.0	NW	Low
21	13.0	NW	Low

7.4 Flood Defences

Are there any Flood Defences within 250m of the study site? No
Database searched and no data found.

7.5 Areas benefiting from Flood Defences

Are there any areas benefiting from Flood Defences within 250m of the study site? No

7.6 Areas benefiting from Flood Storage

Are there any areas used for Flood Storage within 250m of the study site? No

7.7 Groundwater Flooding Susceptibility Areas

7.7.1 Are there any British Geological Survey groundwater flooding susceptibility areas within 50m of the boundary of the study site? Yes

Does this relate to Clearwater Flooding or Superficial Deposits Flooding? Clearwater Flooding

Notes: Groundwater flooding may either be associated with shallow unconsolidated sedimentary aquifers which overlie unproductive aquifers (Superficial Deposits Flooding), or with unconfined aquifers (Clearwater Flooding).

7.7.2 What is the highest susceptibility to groundwater flooding in the search area based on the underlying geological conditions?

Limited potential

Where limited potential for groundwater flooding to occur is indicated, this means that although given the geological conditions there may be a groundwater flooding hazard, unless other relevant information, e.g. records of previous flooding, suggests groundwater flooding has occurred before in this area, you need take no further action in relation to groundwater flooding hazard.

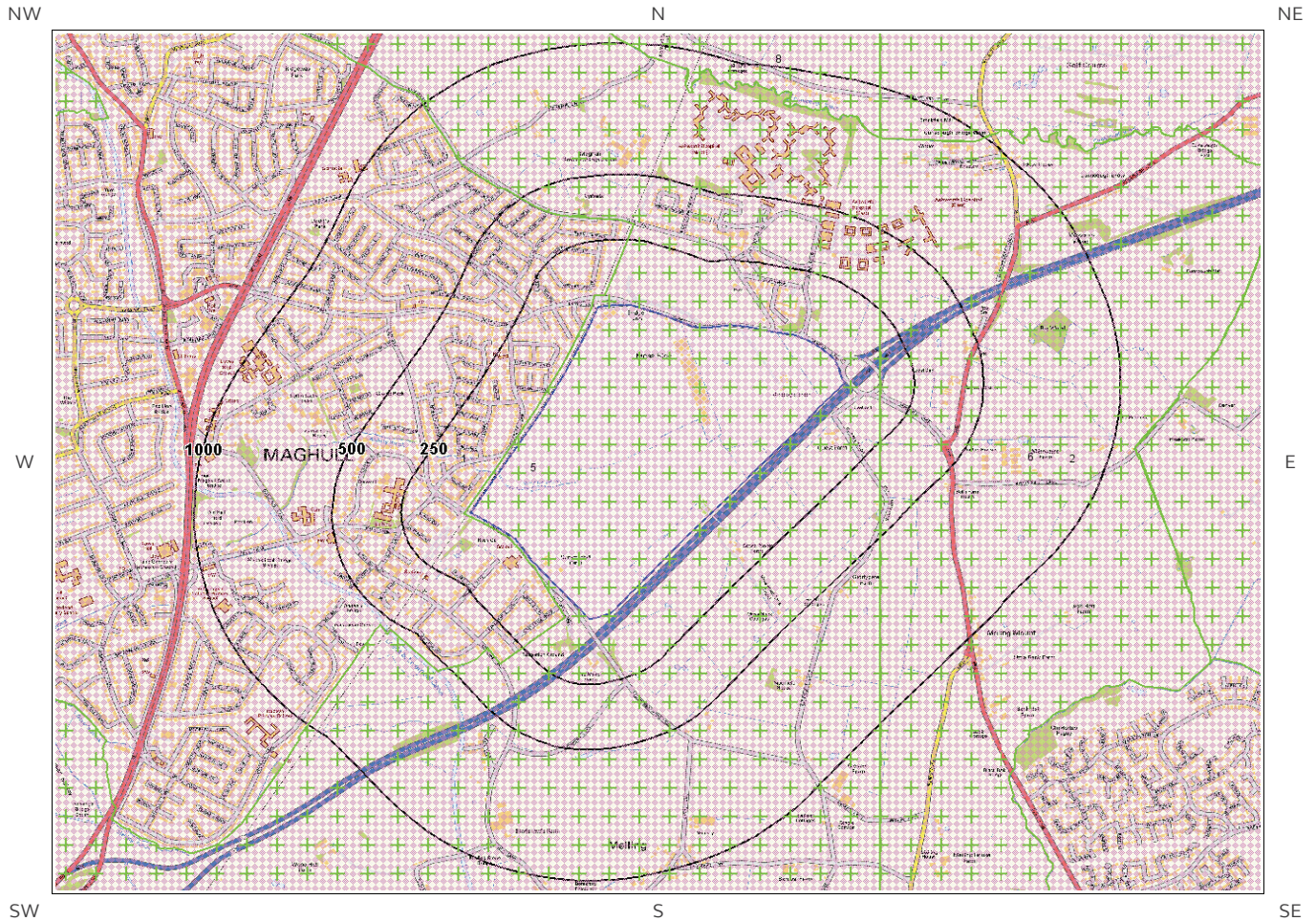
7.8 Groundwater Flooding Confidence Areas

What is the British Geological Survey confidence rating in this result? Low

Notes: Groundwater flooding is defined as the emergence of groundwater at the ground surface or the rising of groundwater into man-made ground under conditions where the normal range of groundwater levels is exceeded.

The confidence rating is on a threefold scale - Low, Moderate and High. This provides a relative indication of the BGS confidence in the accuracy of the susceptibility result for groundwater flooding. This is based on the amount and precision of the information used in the assessment. In areas with a relatively lower level of confidence the susceptibility result should be treated with more caution. In other areas with higher levels of confidence the susceptibility result can be used with more confidence.

8. Designated Environmentally Sensitive Sites Map



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8. Designated Environmentally Sensitive Sites

Presence of Designated Environmentally Sensitive Sites within 2000m of the study site? Yes

8.1 Records of Sites of Special Scientific Interest (SSSI) within 2000m of the study site:

0

Database searched and no data found.

8.2 Records of National Nature Reserves (NNR) within 2000m of the study site:

0

Database searched and no data found.

8.3 Records of Special Areas of Conservation (SAC) within 2000m of the study site:

0

Database searched and no data found.

8.4 Records of Special Protection Areas (SPA) within 2000m of the study site:

0

Database searched and no data found.

8.5 Records of Ramsar sites within 2000m of the study site:

0

Database searched and no data found.

8.6 Records of Ancient Woodland within 2000m of the study site:

Database searched and no data found.

0

8.7 Records of Local Nature Reserves (LNR) within 2000m of the study site:

Database searched and no data found.

0

8.8 Records of World Heritage Sites within 2000m of the study site:

Database searched and no data found.

0

8.9 Records of Environmentally Sensitive Areas within 2000m of the study site:

Database searched and no data found.

0

8.10 Records of Areas of Outstanding Natural Beauty (AONB) within 2000m of the study site:

Database searched and no data found.

0

8.11 Records of National Parks (NP) within 2000m of the study site:

Database searched and no data found.

0

8.12 Records of Nitrate Sensitive Areas within 2000m of the study site:

Database searched and no data found.

0

8.13 Records of Nitrate Vulnerable Zones within 2000m of the study site:

4

The following Nitrate Vulnerable Zone records produced by DEFRA are represented as polygons on the Designated Environmentally Sensitive Sites Map:

ID	Distance (m)	Direction	NVZ Name	Data Source
1	0	On Site	Existing	DEFRA
2	124	E	Existing	DEFRA
Not shown	1322	S	Existing	DEFRA
Not shown	1661	SE	Existing	DEFRA

8.14 Records of Green Belt land within 2000m of the study site:

6

Green Belt data contains Ordnance Survey data © Crown copyright and database right [2015].

ID	Distance	Direction	Green Belt Name	Local Authority Name
5	0	On Site	Liverpool, Manchester and West Yorks Greenbelt	Sefton District (B)
6	124	E	Liverpool, Manchester and West Yorks Greenbelt	Sefton District (B)
7	818	N	Liverpool, Manchester and West Yorks Greenbelt	West Lancashire District (B)
8	818	N	Liverpool, Manchester and West Yorks Greenbelt	West Lancashire District (B)
Not shown	1322	S	Liverpool, Manchester and West Yorks Greenbelt	Sefton District (B)
Not shown	1661	SE	Liverpool, Manchester and West Yorks Greenbelt	Sefton District (B)

9. Natural Hazards Findings

9.1 Detailed BGS GeoSure Data

BGS GeoSure Data has been searched to 50m. The data is included in tabular format. If you require further information on geology and ground stability, please obtain a Groundsure Geo Insight, available from our [website](#). The following information has been found:

9.1.1 Shrink Swell

What is the maximum Shrink-Swell* hazard rating identified on the study site? Very Low

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Ground conditions predominantly low plasticity. No special actions required to avoid problems due to shrink-swell clays. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with shrink-swell clays.

9.1.2 Landslides

What is the maximum Landslide* hazard rating identified on the study site? Very Low

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Slope instability problems are unlikely to be present. No special actions required to avoid problems due to landslides. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with landslides.

9.1.3 Soluble Rocks

What is the maximum Soluble Rocks* hazard rating identified on the study site? Negligible

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Soluble rocks are present, but unlikely to cause problems except under exceptional conditions. No special actions required to avoid problems due to soluble rocks. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with soluble rocks.

* This indicates an automatically generated 50m buffer and site.

9.1.4 Compressible Ground

What is the maximum Compressible Ground* hazard rating identified on the study site? Negligible

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
No indicators for compressible deposits identified. No special actions required to avoid problems due to compressible deposits. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with compressible deposits.

9.1.5 Collapsible Rocks

What is the maximum Collapsible Rocks* hazard rating identified on the study site? Very Low

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Deposits with potential to collapse when loaded and saturated are unlikely to be present. No special ground investigation required or increased construction costs or increased financial risk due to potential problems with collapsible deposits.

9.1.6 Running Sand

What is the maximum Running Sand** hazard rating identified on the study site? Low

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Possibility of running sand problems after major changes in ground conditions. Normal maintenance to avoid leakage of water-bearing services or water bodies (ponds, swimming pools) should reduce likelihood of problems due to running sand. For new build consider possibility of running sand into trenches or excavations if water table is high or sandy strata are exposed to water. Avoid concentrated water inputs to site. Unlikely to be an increase in construction costs due to potential for running sand. For existing property no significant increase in insurance risk due to running sand problems is likely.

9.2 Radon

9.2.1 Radon Affected Areas

Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level? The property is not in a Radon Affected Area, as less than 1% of properties are above the Action Level.

* This indicates an automatically generated 50m buffer and site.

9.2.2 Radon Protection

Is the property in an area where Radon Protection are required for new properties or extensions to existing

ones as described in publication BR211 by the Building Research Establishment? No radon protective measures are necessary.

10. Mining

10.1 Coal Mining

Are there any coal mining areas within 75m of the study site? No

Database searched and no data found.

10.2 Non-Coal Mining

Are there any Non-Coal Mining areas within 50m of the study site boundary? No

Database searched and no data found.

10.3 Brine Affected Areas

Are there any brine affected areas within 75m of the study site? No

Guidance: No Guidance Required.

Contact Details

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info@groundsure.com

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Email: enquiries@phe.gov.uk
Main switchboard: 020 7654 8000

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DX 716176 Mansfield 5
www.coal.gov.uk

Ordnance Survey
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SO16 0AS
Tel: 08456 050505

Local Authority
Authority: Sefton Metropolitan Borough Council
Phone: 0845 140 0845
Web: <http://www.sefton.gov.uk/>
Address: 324-342 Stanley Road, Bootle, Merseyside, L20 6ET

Gemapping PLC
Virginia Villas, High Street, Hartley Witney,
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Acknowledgements: Site of Special Scientific Interest, National Nature Reserve, Ramsar Site, Special Protection Area, Special Area of Conservation data is provided by, and used with the permission of, Natural England who retain the Copyright and Intellectual Property Rights for the data.

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<https://www.groundsure.com/terms-and-conditions-sept-2016>



Arcadis LLP

Arcadis UK Ltd, 3 PICCADILLY PLACE,
MANCHESTER, M1 3BN

Groundsure Reference: GS-3683404

Your Reference: 3013996

Report Date 24 Feb 2017

Report Delivery Method: Email - pdf

Groundsure Geo Insight

Address: ASHWORTH FARM, 1, SCHOOL LANE, LIVERPOOL, L31 1BE

Dear Sir/ Madam,

Thank you for placing your order with Groundsure. Please find enclosed the **Groundsure Geo Insight** as requested.

If you need any further assistance, please do not hesitate to contact our helpline on 08444 159000 quoting the above Groundsure reference number.

Yours faithfully,



Managing Director
Groundsure Limited

Enc.
Groundsure Geoinsight

Groundsure Geo Insight

Address: ASHWORTH FARM, 1, SCHOOL LANE, LIVERPOOL, L31 1BE
Date: 24 Feb 2017
Reference: GS-3683404
Client: Arcadis LLP

NW

N

NE

W

E



SW

S

SE

Aerial Photograph Capture date: 11-Jun-2015
Grid Reference: 339140,401957
Site Size: 86.09ha

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Overview of Findings

The Groundsure Geo Insight provides high quality geo-environmental information that allows geo-environmental professionals and their clients to make informed decisions and be forewarned of potential ground instability problems that may affect the ground investigation, foundation design and possibly remediation options that could lead to possible additional costs.

The report is based on the BGS 1:50,000 Digital Geological Map of Great Britain, BGS Geosure data; BRITPITS database; Shallow Mining data and Borehole Records, Coal Authority data including brine extraction areas, PBA non-coal mining and natural cavities database, Johnson Poole and Bloomer mining data and Groundsure's unique database including historical surface ground and underground workings.

For further details on each dataset, please refer to each individual section in the report as listed. Where the database has been searched a numerical result will be recorded. Where the database has not been searched '-' will be recorded.

Section 1:Geology

1.1 Artificial Ground	1.1.1 Is there any Artificial Ground/ Made Ground present beneath the study site?	No
	1.1.2 Are there any records relating to permeability of artificial ground within the study site* boundary?	No
1.2 Superficial Geology and Landslips	1.2.1 Is there any Superficial Ground/Drift Geology present beneath the study site?	Yes
	1.2.2 Are there any records relating to permeability of superficial geology within the study site boundary?	Yes
	1.2.3 Are there any records of landslip within 500m of the study site boundary?	No
	1.2.4 Are there any records relating to permeability of landslips within the study site boundary?	No
1.3 Bedrock, Solid Geology & Faults	1.3.1 For records of Bedrock and Solid Geology beneath the study site* see the detailed findings section.	
	1.3.2 Are there any records relating to permeability of bedrock within the study site boundary?	Yes
	1.3.3 Are there any records of faults within 500m of the study site boundary?	No
1.4 Radon data	1.4.1 Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level?	The property is not in a Radon Affected Area, as less than 1% of properties are above the Action Level
	1.4.2 Is the property in an area where Radon Protection Measures are required for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment?	No radon protective measures are necessary

Section 2:Ground Workings

	On-site	0-50m	51-250	251-500	501-1000
2.1 Historical Surface Ground Working Features from Small Scale Mapping	3	17	30	Not Searched	Not Searched
2.2 Historical Underground Workings from Small Scale Mapping	0	0	0	0	0
2.3 Current Ground Workings	0	0	0	0	0

Section 3: Mining, Extraction & Natural Cavities	On-site	0-50m	51-250	251-500	501-1000
3.1 Historical Mining	0	0	0	0	0
3.2 Coal Mining	0	0	0	0	0
3.3 Johnson Poole and Bloomer Mining Area	0	0	2	0	2
3.4 Non-Coal Mining	0	0	0	0	0
3.5 Non-Coal Mining Cavities	0	0	0	0	0
3.6 Natural Cavities	0	0	0	0	0
3.7 Brine Extraction	0	0	0	0	0
3.8 Gypsum Extraction	0	0	0	0	0
3.9 Tin Mining	0	0	0	0	0
3.10 Clay Mining	0	0	0	0	0

Section 4: Natural Ground Subsidence	On-site
4.1 Shrink Swell Clay	Very Low
4.2 Landslides	Very Low
4.3 Ground Dissolution of Soluble Rocks	Negligible
4.4 Compressible Deposits	Negligible
4.5 Collapsible Deposits	Very Low
4.6 Running Sand	Low

Section 5: Borehole Records	On-site	0-50m	51-250
5 BGS Recorded Boreholes	6	4	16

Section 6: Estimated Background Soil Chemistry	On-site	0-50m	51-250
6 Records of Background Soil Chemistry	15	1	20

Section 7: Railways and Tunnels	On-site	0-50m	51-250	251-500
7.1 Tunnels	0	0	0	Not Searched
7.2 Historical Railway and Tunnel Features	0	13	2	Not Searched
7.3 Historical Railways	0	0	0	Not Searched
7.4 Active Railways	0	5	0	Not Searched

Section 7:Railways and Tunnels	On-site	0-50m	51-250	251-500
7.5 Railway Projects	0	0	0	0

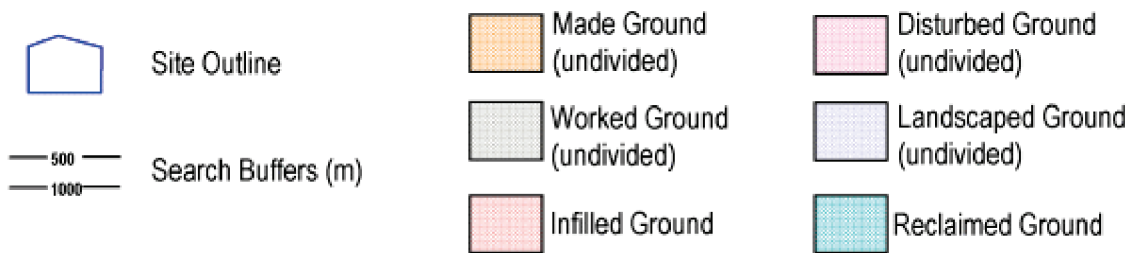
1 Geology

1.1 Artificial Ground Map



Artificial Ground Legend

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1 Geology

1.1 Artificial Ground

1.1.1 Artificial/ Made Ground

The following geological information represented on the mapping is derived from 1:50,000 scale BGS Geological mapping, Sheet No:083

Are there any records of Artificial/Made Ground within 500m of the study site boundary? No

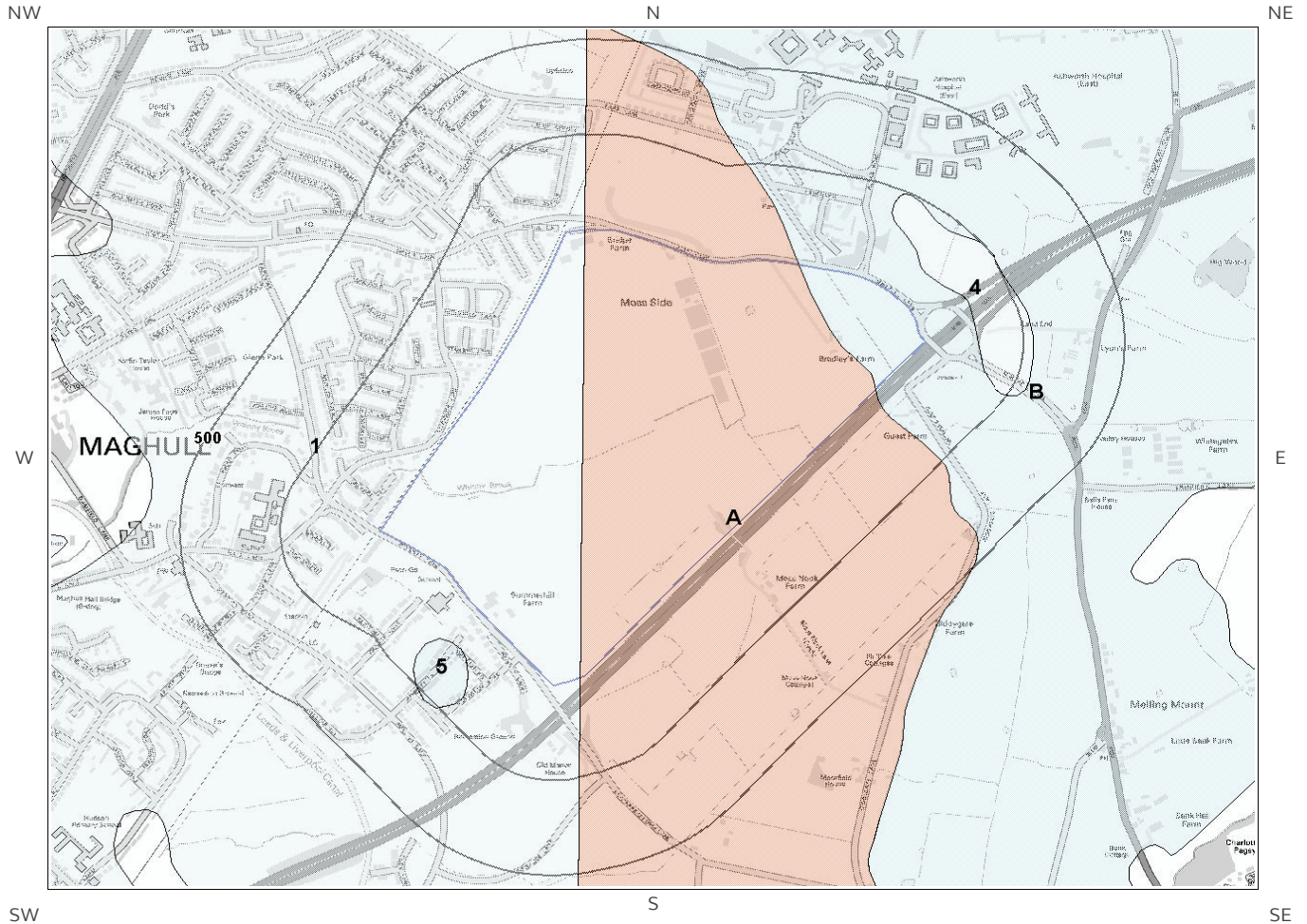
Database searched and no data found.

1.1.2 Permeability of Artificial Ground

Are there any records relating to permeability of artificial ground within the study site boundary? No

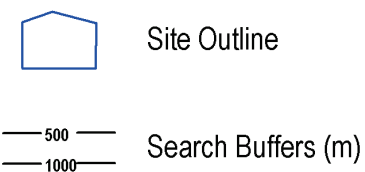
Database searched and no data found.

1.2 Superficial Deposits and Landslips Map



Superficial Deposits and Landslips Legend

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1.2 Superficial Deposits and Landslips

1.2.1 Superficial Deposits/ Drift Geology

Are there any records of Superficial Deposits/ Drift Geology within 500m of the study site boundary? Yes

ID	Distance (m)	Direction	LEX Code	Description	Rock Description
1	0.0	On Site	SSA	SHIRDLEY HILL SAND FORMATION	SAND [UNLITHIFIED DEPOSITS CODING SCHEME]
2B	0.0	On Site	TILLD	TILL, DEVENSIAN	DIAMICTON
3A	0.0	On Site	SSA	SHIRDLEY HILL SAND FORMATION	SAND [UNLITHIFIED DEPOSITS CODING SCHEME]
6A	0.0	On Site	SSA	SHIRDLEY HILL SAND FORMATION	SAND [UNLITHIFIED DEPOSITS CODING SCHEME]
7B	0.0	On Site	TILLD	TILL, DEVENSIAN	DIAMICTON
4	95.0	NE	SSA	SHIRDLEY HILL SAND FORMATION	SAND [UNLITHIFIED DEPOSITS CODING SCHEME]
5	101.0	SW	TILLD	TILL, DEVENSIAN	DIAMICTON

1.2.2 Permeability of Superficial Ground

Are there any records relating to permeability of superficial ground within the study site boundary? Yes

Distance (m)	Direction	Flow Type	Maximum Permeability	Minimum Permeability
0.0	On Site	Mixed	High	Low
0.0	On Site	Intergranular	High	High

1.2.3 Landslip

Are there any records of Landslip within 500m of the study site boundary?

No

Database searched and no data found.

This Geology shows the main components as discrete layers, these are: Artificial / Made Ground, Superficial / Drift Geology and Landslips. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nationwide coverage.

1.2.4 Landslip Permeability

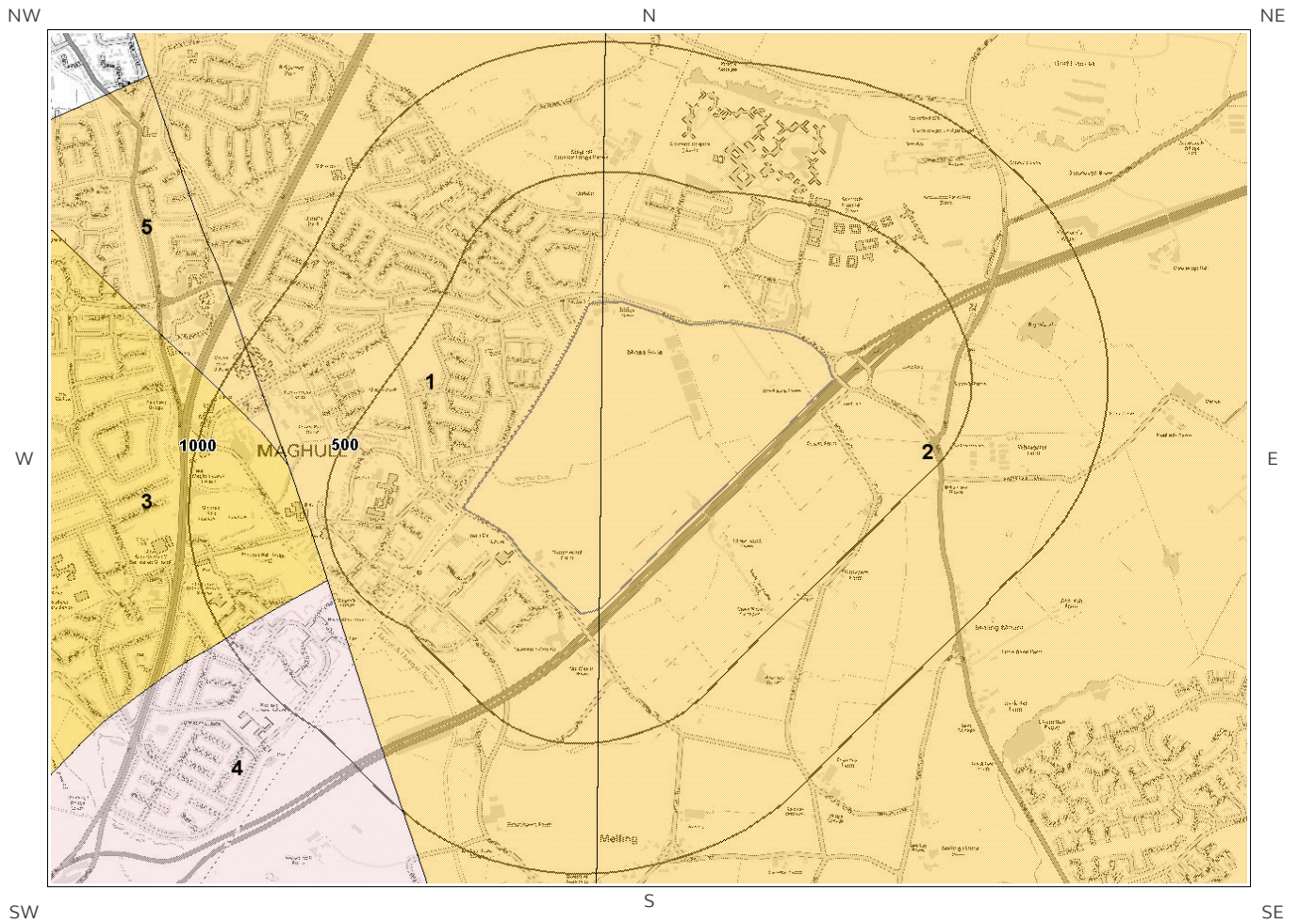
Are there any records relating to permeability of landslips within the study site** boundary?

No

Database searched and no data found.

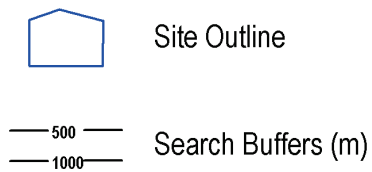
* This includes an automatically generated 50m buffer zone around the site

1.3 Bedrock and Faults Map



Bedrock and Faults Legend

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1.3 Bedrock, Solid Geology & Faults

The following geological information represented on the mapping is derived from 1:50,000 scale BGS Geological mapping, Sheet No:083

1.3.1 Bedrock/ Solid Geology

Records of Bedrock/ Solid Geology within 500m of the study site boundary:

ID	Distance (m)	Direction	LEX Code	Description	Rock Age
1	0.0	On Site	SSG-SDST	Sherwood Sandstone Group - Sandstone	Ladinian /
2	0.0	On Site	SSG-SDST	Sherwood Sandstone Group - Sandstone	Ladinian /

1.3.2 Permeability of Bedrock Ground

Are there any records relating to permeability of bedrock ground within the study site* boundary? Yes

Distance (m)	Direction	Flow Type	Maximum Permeability	Minimum Permeability
0.0	On Site	Mixed	High	High

1.3.3 Faults

Are there any records of Faults within 500m of the study site boundary? No

Database searched and no data found.

The geology map for the site and surrounding area are extracted from the BGS Digital Geological Map of Great Britain at 1:50,000 scale.

This Geology shows the main components as discrete layers, these are: Bedrock/ Solid Geology and linear features such as Faults. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nationwide coverage.

* This includes an automatically generated 50m buffer zone around the site

1.4 Radon Data

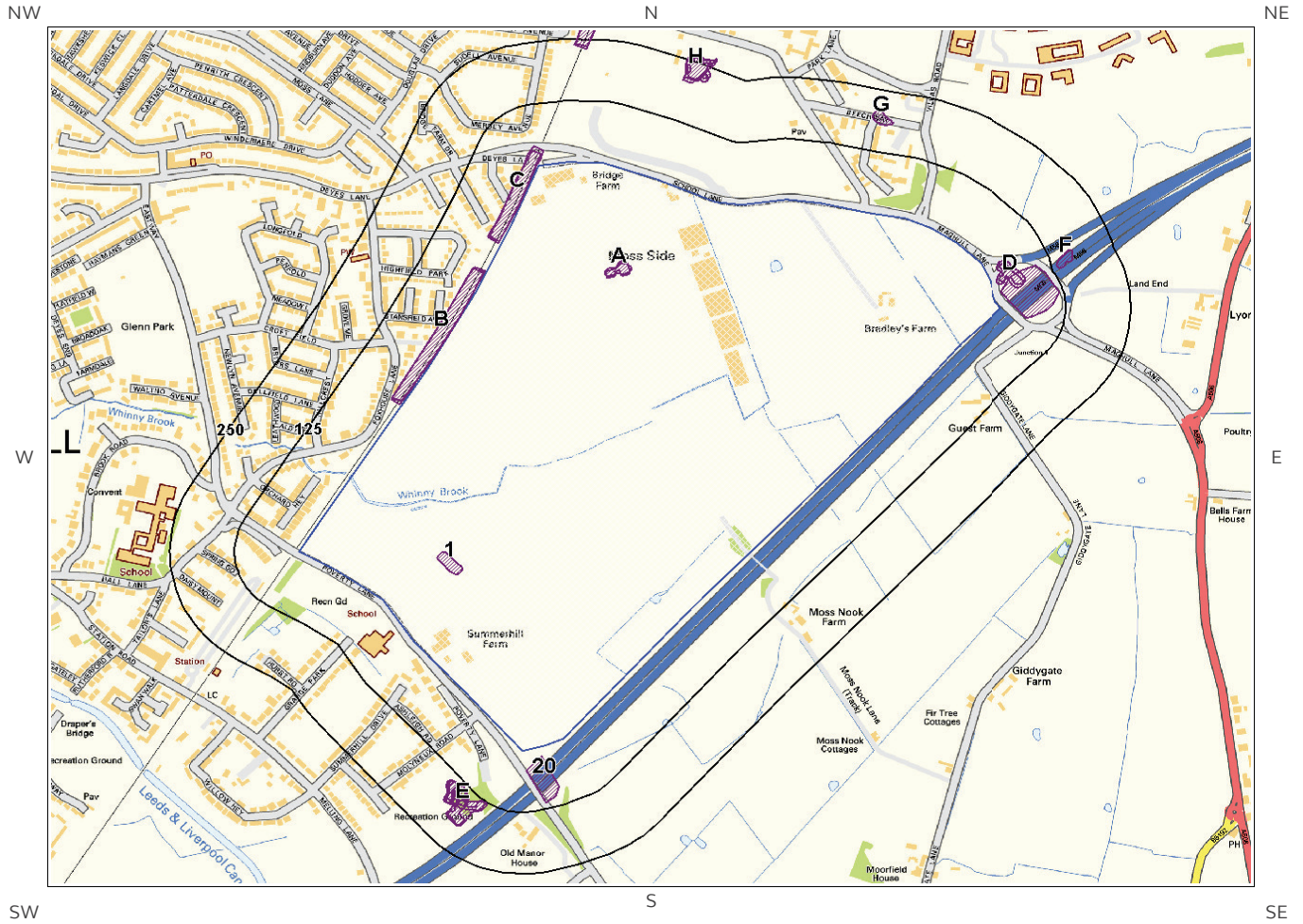
1.4.1 Radon Affected Areas

Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level? The property is not in a Radon Affected Area, as less than 1% of properties are above the Action Level

1.4.2 Radon Protection

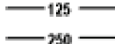
Is the property in an area where Radon Protection are required for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment? No radon protective measures are necessary

2 Ground Workings Map



Ground Workings Legend

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-  Site Outline
-  Search Buffers (m)
-  Historic Surface Ground Workings
-  Historic Underground Workings
-  Current Ground Workings

2 Ground Workings

2.1 Historical Surface Ground Working Features derived from Historical Mapping

This dataset is based on Groundsure's unique Historical Land Use Database derived from 1:10,560 and 1:10,000 scale historical mapping.

Are there any Historical Surface Ground Working Features within 250m of the study site boundary? Yes

The following Historical Surface Ground Working Features are provided by Groundsure:

ID	Distance (m)	Direction	NGR	Use	Date
1	0.0	On Site	338808 401704	Ponds	1891
2A	0.0	On Site	339132 402305	Ponds	1907
3A	0.0	On Site	339124 402301	Ponds	1892
4B	1.0	NW	338787 402172	Cuttings	1949
5B	1.0	NW	338784 402167	Cuttings	1926
6B	1.0	NW	338784 402167	Cuttings	1938
7B	1.0	NW	338784 402167	Cuttings	1892
8B	1.0	NW	338784 402167	Cuttings	1907
9C	3.0	NW	338937 402457	Cuttings	1949
10C	4.0	NW	338933 402451	Cuttings	1938
11C	4.0	NW	338933 402451	Cuttings	1907
12C	4.0	NW	338933 402451	Cuttings	1892
13C	4.0	NW	338933 402451	Cuttings	1926
14D	15.0	E	339895 402290	Ponds	1892
15D	15.0	E	339895 402290	Ponds	1926
16D	15.0	E	339895 402290	Ponds	1938
17D	15.0	E	339895 402290	Ponds	1907
18D	17.0	E	339933 402257	Cuttings	1985
19D	19.0	E	339898 402297	Ponds	1949
20	19.0	S	338987 401264	Cuttings	1985

ID	Distance (m)	Direction	NGR	Use	Date
21E	127.0	SW	338840 401216	Ponds	1891
22E	128.0	SW	338806 401231	Ponds	1925
23E	131.0	SW	338824 401234	Ponds	1949
24F	135.0	E	339999 402324	Ponds	1907
25F	135.0	E	339999 402324	Ponds	1926
26F	135.0	E	339999 402324	Ponds	1938
27F	135.0	E	339999 402324	Ponds	1892
28E	136.0	SW	338829 401216	Ponds	1907
29E	139.0	SW	338809 401238	Pond	1938
30G	180.0	N	339645 402614	Pond	1926
31G	180.0	N	339645 402614	Pond	1907
32G	180.0	N	339645 402614	Pond	1938
33G	180.0	N	339645 402614	Pond	1892
34H	206.0	N	339290 402709	Pond	1938
35H	206.0	N	339290 402709	Pond	1926
36H	206.0	N	339290 402709	Pond	1907
37H	206.0	N	339290 402709	Pond	1892
38H	213.0	N	339293 402715	Pond	1949
39H	215.0	N	339292 402715	Pond	1974
40H	215.0	N	339292 402715	Pond	1985
41H	217.0	N	339300 402693	Unspecified Heap	1938
42H	217.0	N	339300 402693	Unspecified Heap	1907
43H	217.0	N	339300 402693	Unspecified Heap	1926
44H	217.0	N	339300 402693	Unspecified Heap	1892
45H	224.0	N	339304 402700	Unspecified Heap	1949
46I	232.0	N	339143 402972	Cuttings	1938
47I	232.0	N	339143 402972	Cuttings	1926
48I	232.0	N	339143 402972	Cuttings	1892

ID	Distance (m)	Direction	NGR	Use	Date
49I	232.0	N	339143 402972	Cuttings	1907
50I	236.0	N	339147 402978	Cuttings	1949

2.2 Historical Underground Working Features derived from Historical Mapping

This data is derived from the Groundsure unique Historical Land Use Database. It contains data derived from 1:10,000 and 1:10,560 historical Ordnance Survey Mapping and includes some natural topographical features (Shake Holes for example) as well as manmade features that may have implications for ground stability. Underground and mining features have been identified from surface features such as shafts. The distance that these extend underground is not shown.

Are there any Historical Underground Working Features within 1000m of the study site boundary? No

Database searched and no data found.

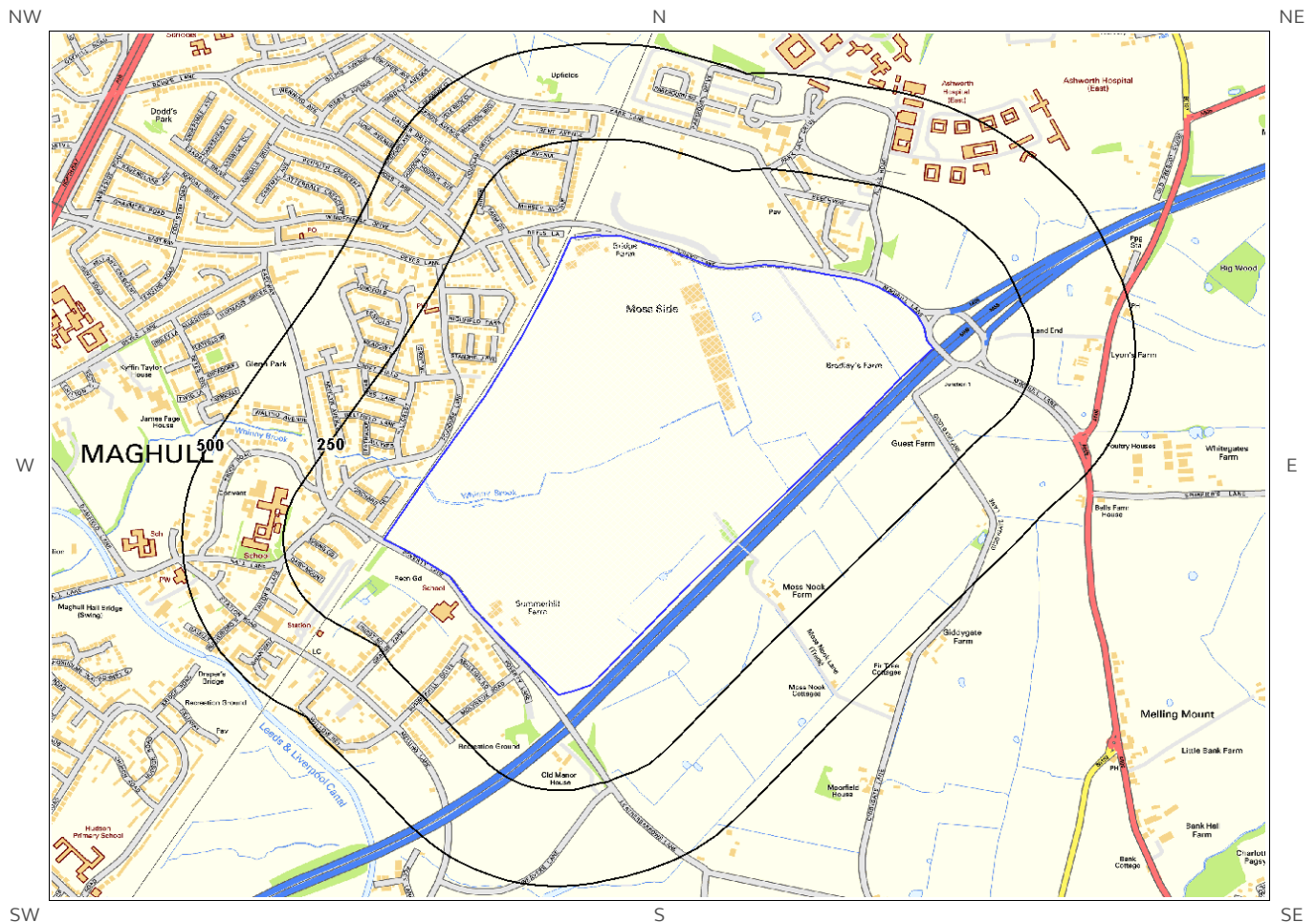
2.3 Current Ground Workings

This dataset is derived from the BGS BRITPITS database covering active; inactive mines; quarries; oil wells; gas wells and mineral wharves; and rail deposits throughout the British Isles.

Are there any BGS Current Ground Workings within 1000m of the study site boundary? No

Database searched and no data found.

3 Mining, Extraction & Natural Cavities Map



Mining, Extraction and Natural Cavities Legend

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3 Mining, Extraction & Natural Cavities

3.1 Historical Mining

This dataset is derived from Groundsure unique Historical Land-use Database that are indicative of mining or extraction activities.

Are there any Historical Mining areas within 1000m of the study site boundary? No

Database searched and no data found.

3.2 Coal Mining

This dataset provides information as to whether the study site lies within a known coal mining affected area as defined by the coal authority.

Are there any Coal Mining areas within 1000m of the study site boundary? No

Database searched and no data found.

3.3 Johnson Poole and Bloomer

This dataset provides information as to whether the study site lies within an area where JPB hold information relating to mining.

Are there any JPB Mining areas within 1000m of the study site boundary? Yes

The following information provided by JPB is not represented on mapping: Whilst outside of an area where The Coal Authority have information on coal mining activities, Johnson Poole & Bloomer (JPB) have information such as mining plans and maps held within their archive of mining activities that have occurred within 1km of this property. Further details and a quote for services can be obtained by emailing this report to enquiries.gs@jpb.co.uk.

3.4 Non-Coal Mining

This dataset provides information as to whether the study site lies within an area which may have been subject to non-coal historic mining.

Are there any Non-Coal Mining areas within 1000m of the study site boundary? No

Database searched and no data found.

3.5 Non-Coal Mining Cavities

This dataset provides information from the Peter Brett Associates (PBA) mining cavities database (compiled for the national study entitled “Review of mining instability in Great Britain, 1990” PBA has also continued adding to this database) on mineral extraction by mining.

Are there any Non-Coal Mining cavities within 1000m of the study site boundary? No

Database searched and no data found.

3.6 Natural Cavities

This dataset provides information based on Peter Brett Associates natural cavities database.

Are there any Natural Cavities within 1000m of the study site boundary? No

Database searched and no data found.

3.7 Brine Extraction

This data provides information from the Coal Authority issued on behalf of the Cheshire Brine Subsidence Compensation Board.

Are there any Brine Extraction areas within 1000m of the study site boundary? No

Database searched and no data found.

3.8 Gypsum Extraction

This dataset provides information on Gypsum extraction from British Gypsum records.

Are there any Gypsum Extraction areas within 1000m of the study site boundary? No

Database searched and no data found.

3.9 Tin Mining

This dataset provides information on tin mining areas and is derived from tin mining records. This search is based upon postcode information to a sector level.

Are there any Tin Mining areas within 1000m of the study site boundary? No

Database searched and no data found.

3.10 Clay Mining

This dataset provides information on Kaolin and Ball Clay mining from relevant mining records.

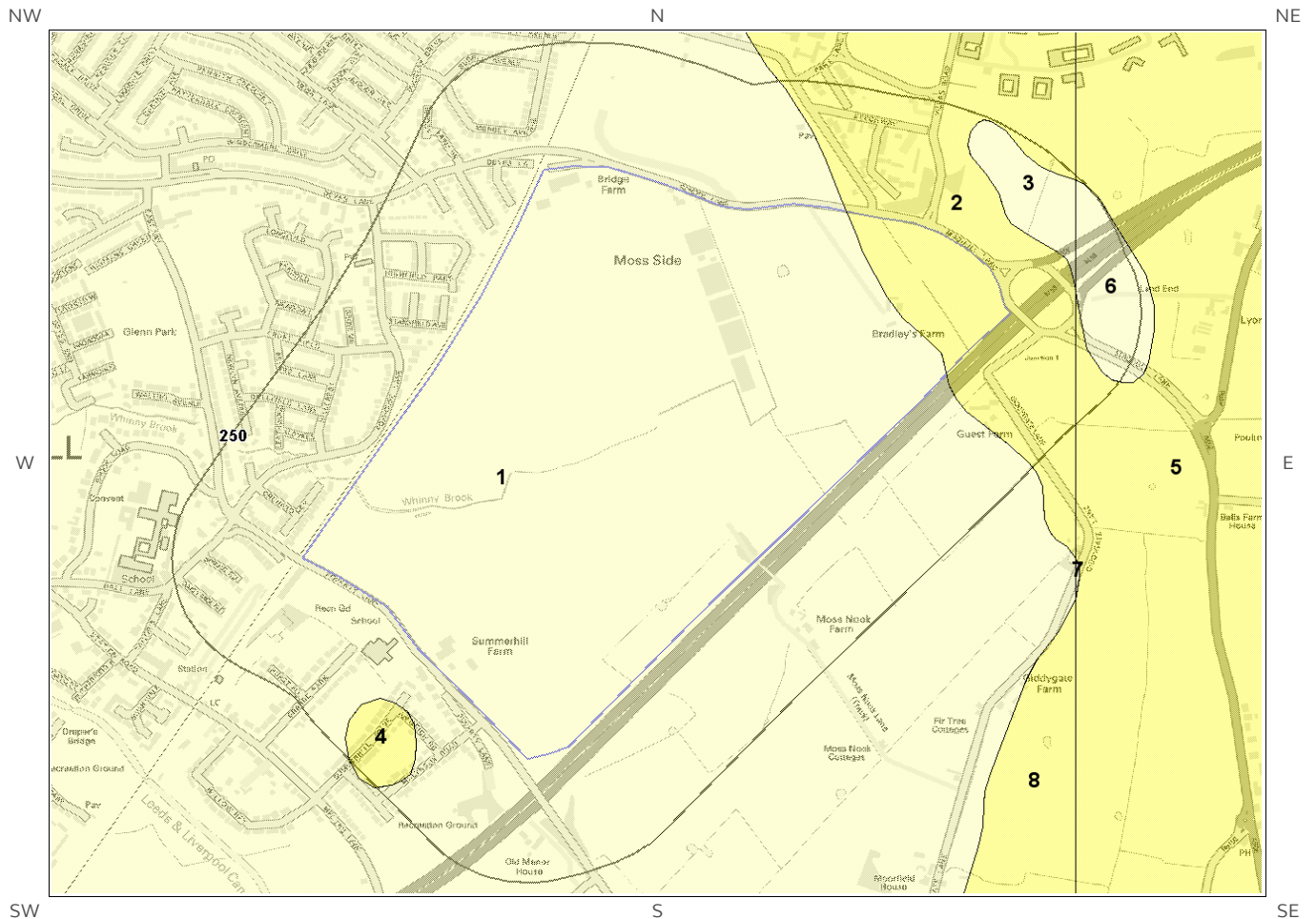
Are there any Clay Mining areas within 1000m of the study site boundary?

No

Database searched and no data found.

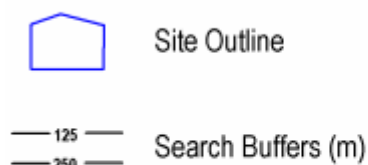
4 Natural Ground Subsidence

4.1 Shrink-Swell Clay Map

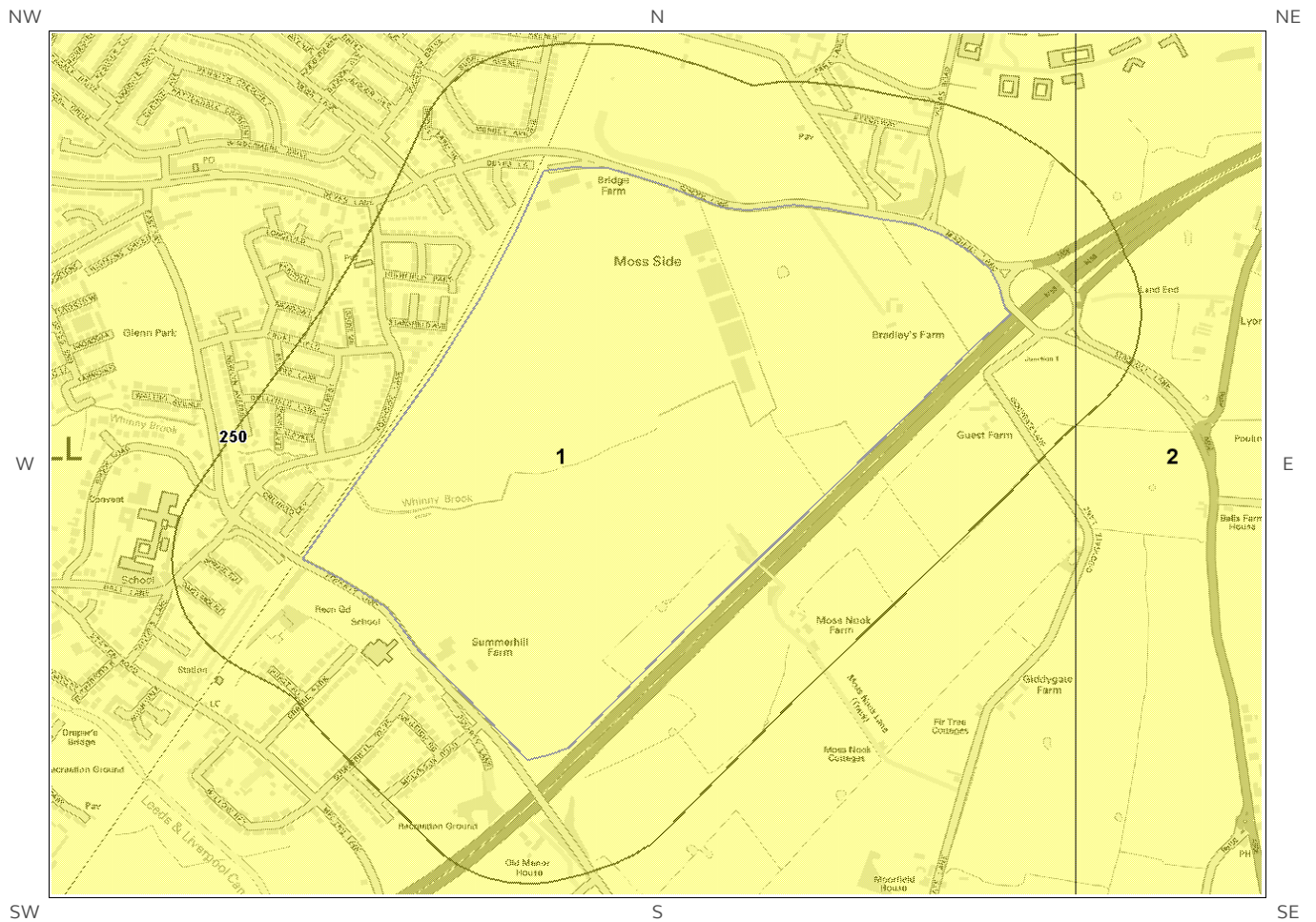


Shrink Swell Clay Legend

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4.2 Landslides Map

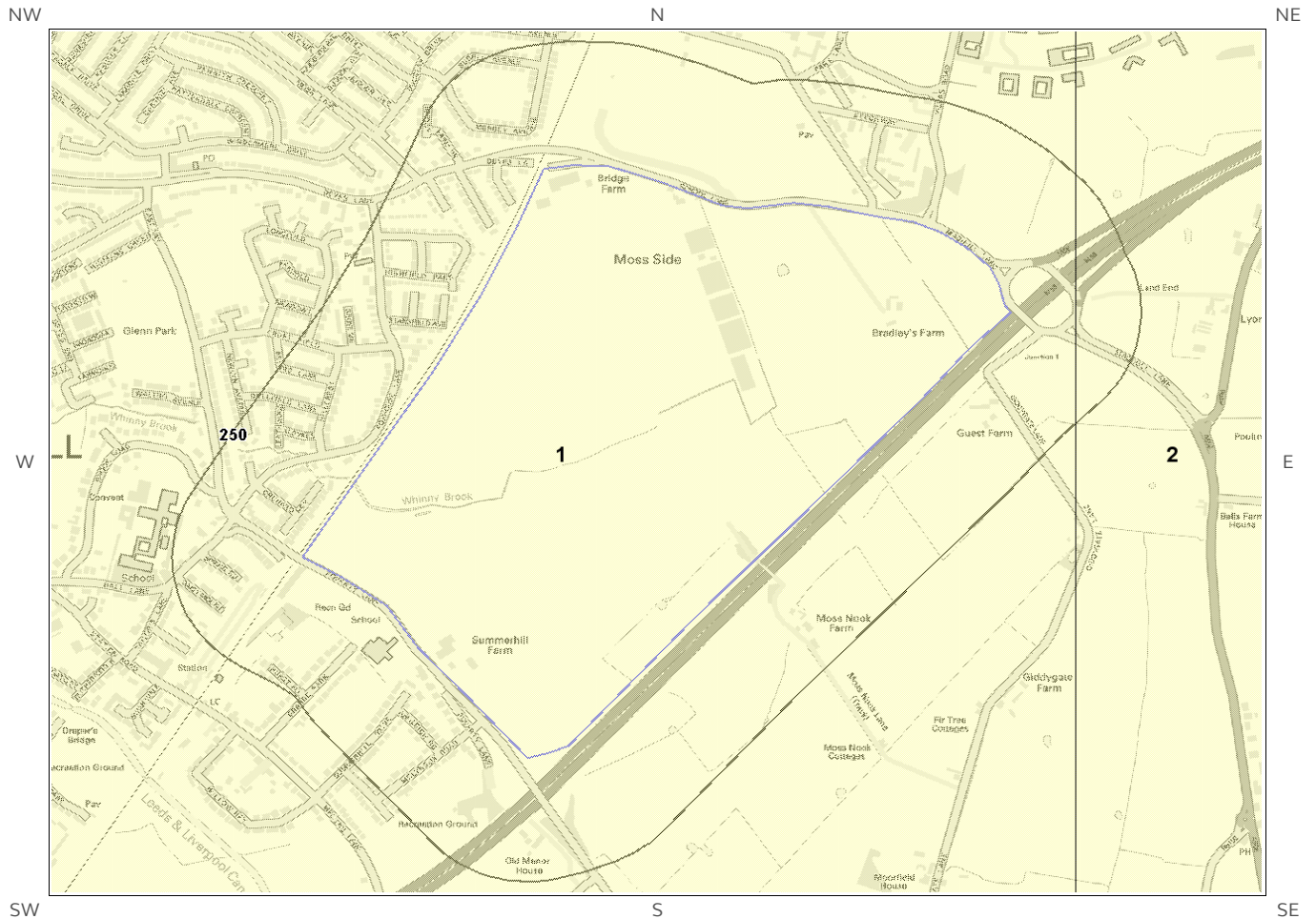


Landslides Legend

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4.3 Ground Dissolution Soluble Rocks Map

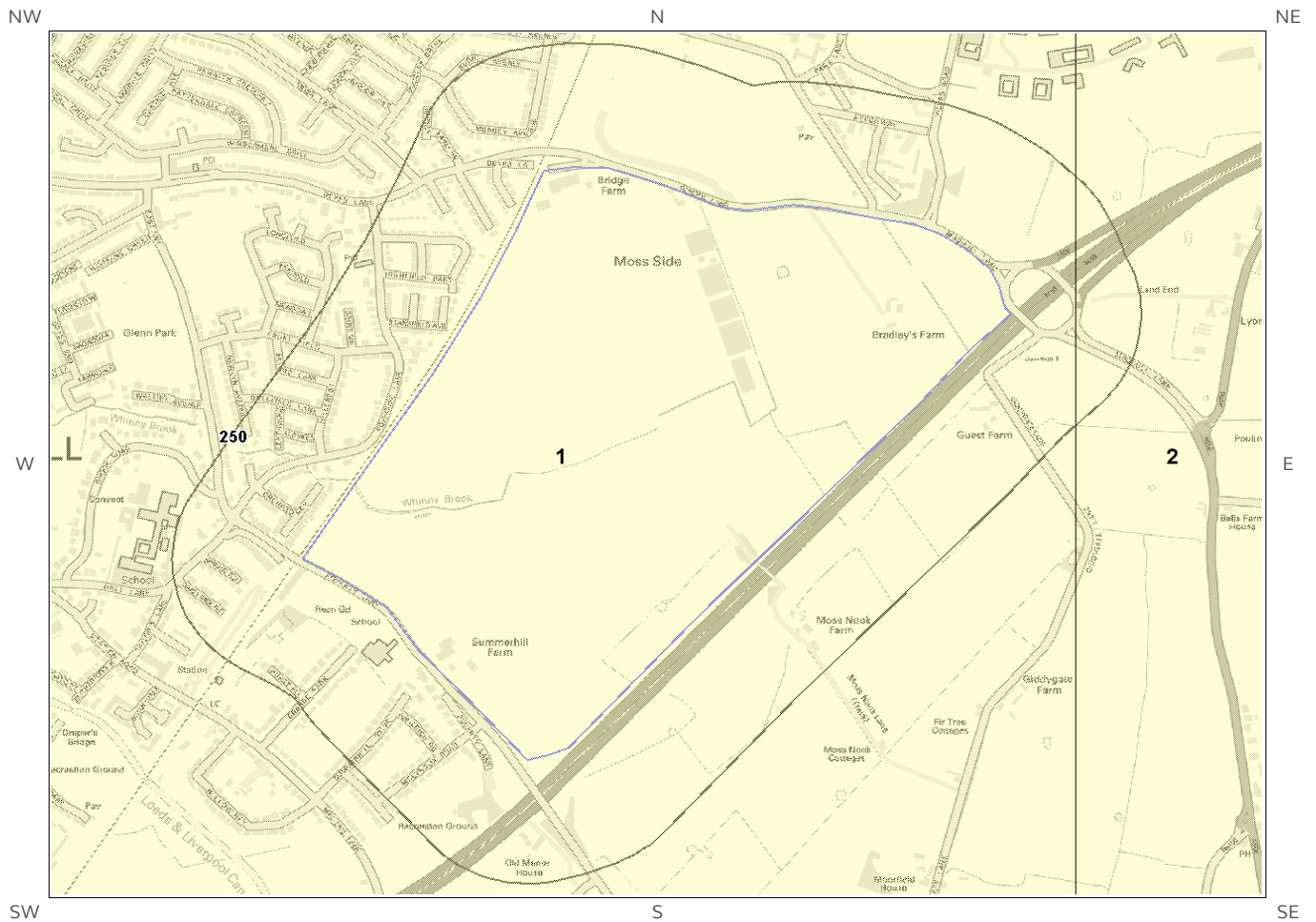


**Ground Dissolution
Soluble Rocks Legend**

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4.4 Compressible Deposits Map

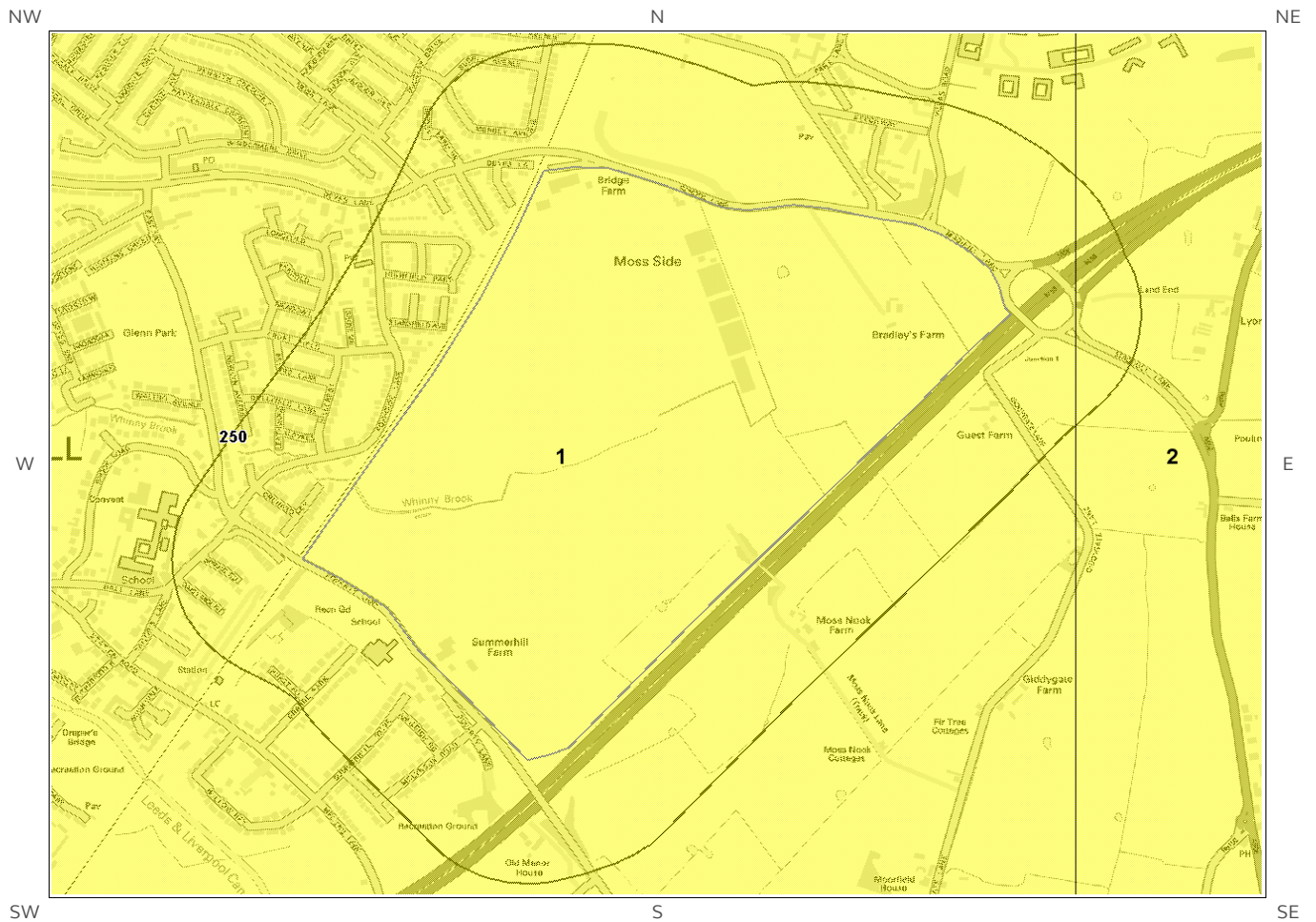


Compressible Deposits Legend

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4.5 Collapsible Deposits Map

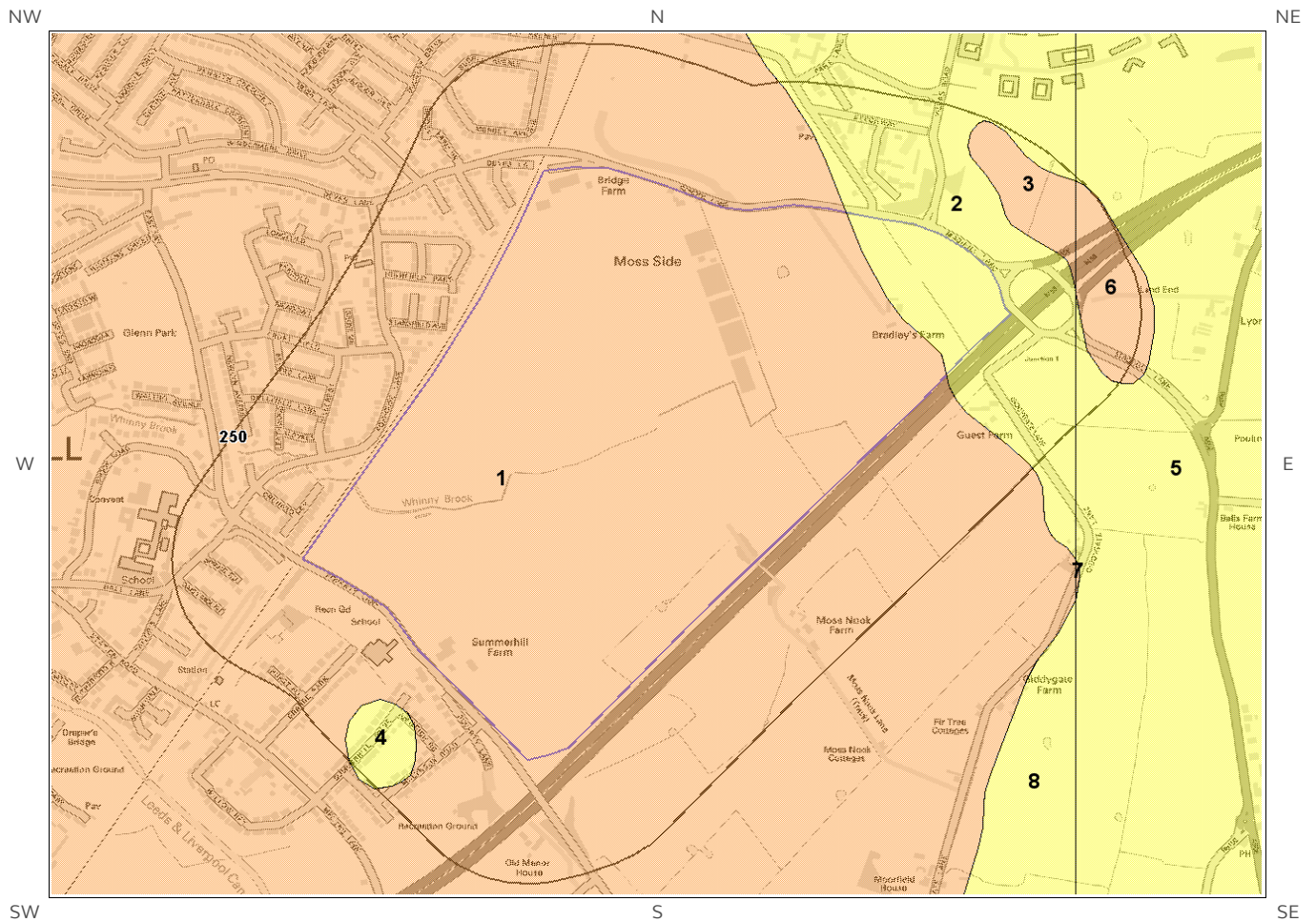


Collapsible Deposits Legend

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4.6 Running Sand Map



Running Sand Legend

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4 Natural Ground Subsidence

The National Ground Subsidence rating is obtained through the 6 natural ground stability hazard datasets, which are supplied by the British Geological Survey (BGS).

The following GeoSure data represented on the mapping is derived from the BGS Digital Geological map of Great Britain at 1:50,000 scale.

What is the maximum hazard rating of natural subsidence within the study site** boundary? Low

4.1 Shrink-Swell Clays

The following Shrink Swell information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Negligible	Ground conditions predominantly non-plastic. No special actions required to avoid problems due to shrink-swell clays. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with shrink-swell clays.
2	0.0	On Site	Very Low	Ground conditions predominantly low plasticity. No special actions required to avoid problems due to shrink-swell clays. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with shrink-swell clays.

4.2 Landslides

The following Landslides information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Very Low	Slope instability problems are unlikely to be present. No special actions required to avoid problems due to landslides. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with landslides.

4.3 Ground Dissolution of Soluble Rocks

The following Ground Dissolution information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Negligible	Soluble rocks are present, but unlikely to cause problems except under exceptional conditions. No special actions required to avoid problems due to soluble rocks. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with soluble rocks.

* This includes an automatically generated 50m buffer zone around the site

4.4 Compressible Deposits

The following Compressible Deposits information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Negligible	No indicators for compressible ground identified. No special actions required to avoid problems due to compressible ground. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with compressible ground.

4.5 Collapsible Deposits

The following Collapsible Rocks information provided by the British Geological Survey:

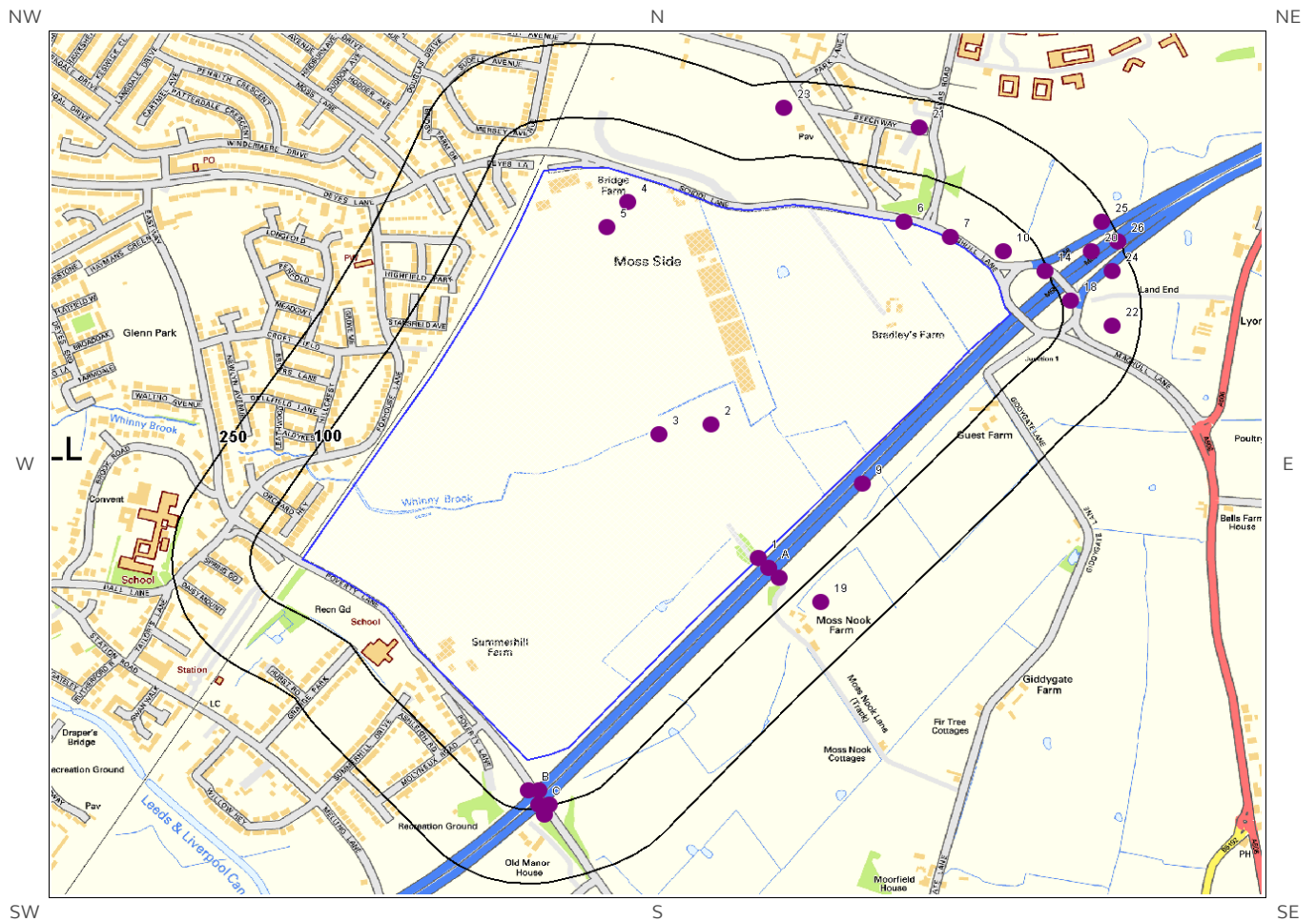
ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Very Low	Deposits with potential to collapse when loaded and saturated are unlikely to be present. No special ground investigation required or increased construction costs or increased financial risk due to potential problems with collapsible deposits.

4.6 Running Sands

The following Running Sands information provided by the British Geological Survey:

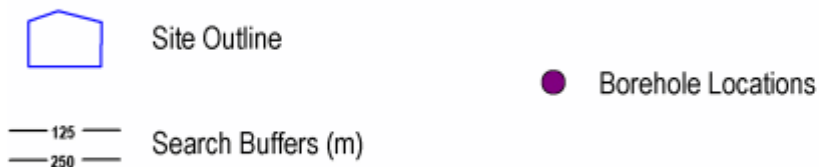
ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Low	Possibility of running sand problems after major changes in ground conditions. Normal maintenance to avoid leakage of water-bearing services or water bodies (ponds, swimming pools) should reduce likelihood of problems due to running sand. For new build, consider possibility of running sand into trenches or excavations if water table is high or sandy strata are exposed to water. Avoid concentrated water inputs to site. Unlikely to be an increase in construction costs due to potential for running sand. For existing property, no significant increase in insurance risk due to running sand problems is likely.
2	0.0	On Site	Very Low	Very low potential for running sand problems if water table rises or if sandy strata are exposed to water. No special actions required to avoid problems due to running sand. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with running sand.

5 Borehole Records Map



Borehole Records Legend

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5 Borehole Records

The systematic analysis of data extracted from the BGS Borehole Records database provides the following information.

Records of boreholes within 250m of the study site boundary:

26

ID	Distance (m)	Direction	NGR	BGS Reference	Drilled Length	Borehole Name
1	0.0	On Site	339390 401730	SD30SE100	16.3	M58 AINTREE-SKELMERSDALE LINK 5906/1
2	0.0	On Site	339300 402000	SD30SE145	-1.0	BRADLEY'S FARM
3	0.0	On Site	339200 401980	SD30SE8	18.29	WHINNY BROOK
4	0.0	On Site	339140 402450	SD30SE7	18.29	WOODBARN FARM (MOSS SIDE)
5	0.0	On Site	339100 402400	SD30SE29	18.29	WOODBARN FARM WELL
6	0.0	N	339670 402410	SD30SE104	5.2	M58 AINTREE-SKELMERSDALE LINK 54
7	4.0	NE	339760 402380	SD30SE105	4.2	M58 AINTREE-SKELMERSDALE LINK 56
8A	27.0	SE	339410 401710	SD30SE102	15.5	M58 AINTREE-SKELMERSDALE LINK 5906/3
9	36.0	SE	339590 401880	SD30SE103	5.5	M58 AINTREE-SKELMERSDALE LINK 47
10	42.0	NE	339860 402350	SD30SE106	5.8	M58 AINTREE-SKELMERSDALE LINK 57
11A	55.0	SE	339430 401690	SD30SE101	16.2	M58 AINTREE-SKELMERSDALE LINK 5906/2
12B	62.0	S	338950 401260	SD30SE95	10.0	M58 AINTREE-SKELMERSDALE LINK 5905/1
13B	65.0	S	338970 401260	SD30SE96	18.8	M58 AINTREE-SKELMERSDALE LINK MAP2 5905/2
14	92.0	E	339940 402310	SD30SE107	4.2	M58 AINTREE-SKELMERSDALE LINK 5907/2
15C	95.0	S	338970 401230	SD30SE99	15.2	M58 AINTREE-SKELMERSDALE LINK 5905/5
16C	99.0	S	338990 401230	SD30SE97	16.2	M58 AINTREE-SKELMERSDALE LINK 5905/3
17C	116.0	S	338980 401210	SD30SE98	10.0	M58 AINTREE-SKELMERSDALE LINK 5905/4

ID	Distance (m)	Direction	NGR	BGS Reference	Drilled Length	Borehole Name
18	117.0	E	339990 402250	SD30SE108	4.9	M58 AINTREE-SKELMERSDALE LINK 5907/6
19	147.0	SE	339510 401640	SD30SE9	13.72	MOSS NOOK
20	190.0	E	340030 402350	SD40SW23	4.5	M58 AINTREE-SKELMERSDALE LINK BH64
21	192.0	N	339700 402600	SD30SE134	-1.0	WOODHILL FARM
22	196.0	E	340070 402200	SD40SW20	6.0	M58 AINTREE-SKELMERSDALE LINK BH58
23	196.0	N	339440 402640	SD30SE6	15.24	CONVALESCENT HOME
24	212.0	NE	340070 402310	SD40SW22	6.9	M58 AINTREE-SKELMERSDALE LINK BH65
25	234.0	NE	340050 402410	SD40SW24	4.5	M58 AINTREE-SKELMERSDALE LINK BH66
26	244.0	E	340080 402370	SD40SW25	4.5	M58 AINTREE-SKELMERSDALE LINK BH67

The borehole records are available using the hyperlinks below: Please note that if the donor of the borehole record has requested the information be held as commercial-in-confidence, the additional data will be held separately by the BGS and a formal request must be made for its release.

#1: scans.bgs.ac.uk/sobi_scans/boreholes/358
 #2: scans.bgs.ac.uk/sobi_scans/boreholes/403
 #3: scans.bgs.ac.uk/sobi_scans/boreholes/238
 #4: scans.bgs.ac.uk/sobi_scans/boreholes/237
 #5: scans.bgs.ac.uk/sobi_scans/boreholes/287
 #6: scans.bgs.ac.uk/sobi_scans/boreholes/362
 #7: scans.bgs.ac.uk/sobi_scans/boreholes/363
 #8A: scans.bgs.ac.uk/sobi_scans/boreholes/360
 #9: scans.bgs.ac.uk/sobi_scans/boreholes/361
 #10: scans.bgs.ac.uk/sobi_scans/boreholes/364
 #11A: scans.bgs.ac.uk/sobi_scans/boreholes/359
 #12B: scans.bgs.ac.uk/sobi_scans/boreholes/353
 #13B: scans.bgs.ac.uk/sobi_scans/boreholes/354
 #14: scans.bgs.ac.uk/sobi_scans/boreholes/365
 #15C: scans.bgs.ac.uk/sobi_scans/boreholes/357
 #16C: scans.bgs.ac.uk/sobi_scans/boreholes/355
 #17C: scans.bgs.ac.uk/sobi_scans/boreholes/356
 #18: scans.bgs.ac.uk/sobi_scans/boreholes/366
 #19: scans.bgs.ac.uk/sobi_scans/boreholes/239
 #20: scans.bgs.ac.uk/sobi_scans/boreholes/3804
 #21: scans.bgs.ac.uk/sobi_scans/boreholes/392
 #22: scans.bgs.ac.uk/sobi_scans/boreholes/3801
 #23: scans.bgs.ac.uk/sobi_scans/boreholes/236
 #24: scans.bgs.ac.uk/sobi_scans/boreholes/3803
 #25: scans.bgs.ac.uk/sobi_scans/boreholes/3805
 #26: scans.bgs.ac.uk/sobi_scans/boreholes/3806

6 Estimated Background Soil Chemistry

Records of background estimated soil chemistry within 250m of the study site boundary:

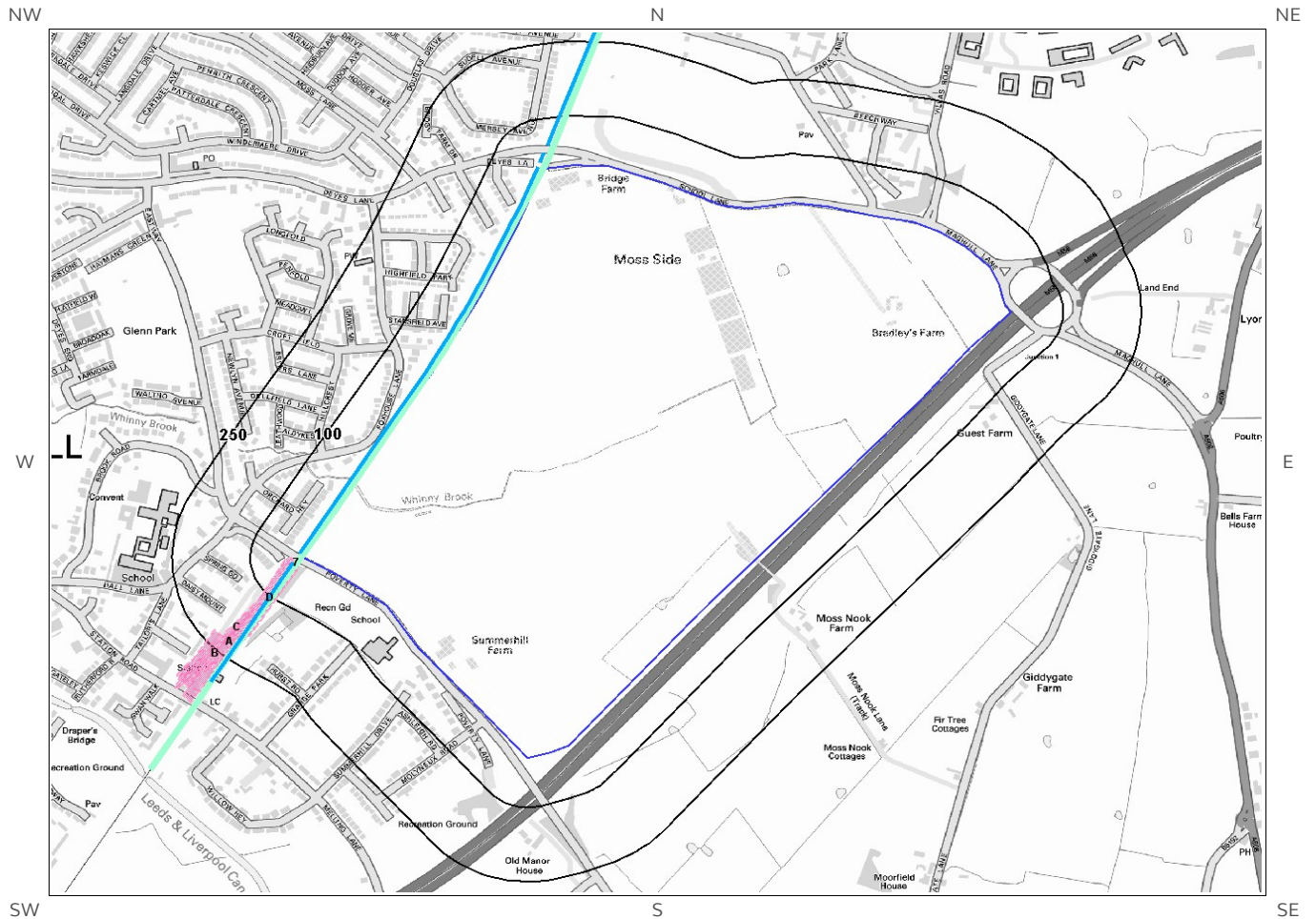
36

For further information on how this data is calculated and limitations upon its use, please see the Groundsure Geo Insight User Guide, available on request.

Distance (m)	Direction	Sample Type	Arsenic (As)	Cadmium (Cd)	Chromium (Cr)	Nickel (Ni)	Lead (Pb)
0.0	On Site	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	90 - 120 mg/kg	15 - 30 mg/kg	<100 mg/kg
0.0	On Site	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	90 - 120 mg/kg	15 - 30 mg/kg	200 - 300 mg/kg
0.0	On Site	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	90 - 120 mg/kg	15 - 30 mg/kg	100 - 200 mg/kg
0.0	On Site	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	90 - 120 mg/kg	15 - 30 mg/kg	<100 mg/kg
0.0	On Site	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	90 - 120 mg/kg	15 - 30 mg/kg	100 - 200 mg/kg
0.0	On Site	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	90 - 120 mg/kg	15 - 30 mg/kg	<100 mg/kg
0.0	On Site	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	90 - 120 mg/kg	15 - 30 mg/kg	100 - 200 mg/kg
0.0	On Site	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	90 - 120 mg/kg	15 - 30 mg/kg	100 - 200 mg/kg
0.0	On Site	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	90 - 120 mg/kg	15 - 30 mg/kg	100 - 200 mg/kg
0.0	On Site	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	90 - 120 mg/kg	15 - 30 mg/kg	200 - 300 mg/kg
0.0	On Site	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	90 - 120 mg/kg	15 - 30 mg/kg	100 - 200 mg/kg
0.0	On Site	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	90 - 120 mg/kg	15 - 30 mg/kg	200 - 300 mg/kg
0.0	On Site	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	90 - 120 mg/kg	15 - 30 mg/kg	100 - 200 mg/kg
0.0	On Site	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	90 - 120 mg/kg	15 - 30 mg/kg	200 - 300 mg/kg
17.0	W	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	90 - 120 mg/kg	15 - 30 mg/kg	100 - 200 mg/kg
59.0	N	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	90 - 120 mg/kg	15 - 30 mg/kg	100 - 200 mg/kg
63.0	N	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	90 - 120 mg/kg	15 - 30 mg/kg	100 - 200 mg/kg
95.0	NE	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	90 - 120 mg/kg	15 - 30 mg/kg	100 - 200 mg/kg
101.0	SW	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	90 - 120 mg/kg	15 - 30 mg/kg	<100 mg/kg
120.0	SE	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	90 - 120 mg/kg	15 - 30 mg/kg	100 - 200 mg/kg
124.0	E	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	90 - 120 mg/kg	15 - 30 mg/kg	<100 mg/kg
124.0	E	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	90 - 120 mg/kg	15 - 30 mg/kg	100 - 200 mg/kg
130.0	E	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	90 - 120 mg/kg	<15 mg/kg	<100 mg/kg
131.0	E	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	90 - 120 mg/kg	<15 mg/kg	100 - 200 mg/kg
140.0	N	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	90 - 120 mg/kg	15 - 30 mg/kg	100 - 200 mg/kg
144.0	NE	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	90 - 120 mg/kg	15 - 30 mg/kg	100 - 200 mg/kg
163.0	NW	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	90 - 120 mg/kg	15 - 30 mg/kg	100 - 200 mg/kg
207.0	SW	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	90 - 120 mg/kg	15 - 30 mg/kg	100 - 200 mg/kg
236.0	NE	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	90 - 120 mg/kg	15 - 30 mg/kg	100 - 200 mg/kg
239.0	SE	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	90 - 120 mg/kg	15 - 30 mg/kg	<100 mg/kg
243.0	NE	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	90 - 120 mg/kg	15 - 30 mg/kg	100 - 200 mg/kg
247.0	NE	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	90 - 120 mg/kg	15 - 30 mg/kg	100 - 200 mg/kg
247.0	NE	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	90 - 120 mg/kg	15 - 30 mg/kg	100 - 200 mg/kg
249.0	SE	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
249.0	SE	RuralSoil	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	100 - 200 mg/kg

*As this data is based upon underlying 1:50,000 scale geological information, a 50m buffer has been added to the search radius.

7 Railways and Tunnels Map



Railways and Tunnels Legend

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	Underground or Partially Underground Railway / Subway System		Railway Track (OpenStreetMap)
	Railway Tunnel (OS Mapping)		High Speed 2
	Abandoned or Dismantled Railway (OpenStreetMap)		High Speed 2 Revised Proposed Route
	Railway Track (OS Mapping)		Crossrail 1
	Site Outline		Railway and/or Tunnel Feature from Historical Mapping
	250 Search Buffers (m)		
	500 Search Buffers (m)		

7 Railways and Tunnels

7.1 Tunnels

This data is derived from OpenStreetMap and provides information on the possible locations of underground railway systems in the UK - the London Underground, the Tyne & Wear Metro and the Glasgow Subway.

Have any underground railway lines been identified within the study site boundary? No

Have any underground railway lines been identified within 250m of the study site boundary? No

Database searched and no data found.

Any records that have been identified are represented on the Railways and Tunnels Map.

This data is derived from Ordnance Survey mapping and provides information on the possible locations of railway tunnels forming part of the UK overground railway network.

Have any other railway tunnels been identified within the site boundary? No

Have any other railway tunnels been identified within 250m of the site boundary? No

Database searched and no data found.

Any records that have been identified are represented on the Railways and Tunnels Map.

7.2 Historical Railway and Tunnel Features

This data is derived from Groundsure's unique Historical Land-use Database and contains features relating to tunnels, railway tracks or associated works that have been identified from historical Ordnance Survey mapping.

Have any historical railway or tunnel features been identified within the study site boundary? No

Have any historical railway or tunnel features been identified within 250m of the study site boundary? Yes

ID	Distance (m)	Direction	NGR	Details	Date
7	16	SW	338504 401711	Railway Sidings	1961
1C	18	SW	338392 401597	Railway Sidings	1968
8C	19	W	338423 401612	Railway Sidings	1961
2A	23	SW	338396 401574	Railway Sidings	1938
3A	23	SW	338396 401574	Railway Sidings	1925
4A	23	SW	338396 401574	Railway Sidings	1907

ID	Distance (m)	Direction	NGR	Details	Date
9D	24	SW	338455 401641	Railway Sidings	1927
10D	24	SW	338455 401641	Railway Sidings	1937
11D	24	SW	338455 401641	Railway Sidings	1908
12C	25	SW	338410 401595	Railway Sidings	1937
13C	25	SW	338410 401595	Railway Sidings	1927
14C	25	SW	338410 401595	Railway Sidings	1908
15C	27	SW	338409 401598	Railway Sidings	1893
5B	124	SW	338360 401543	Railway Sidings	1891
6B	176	SW	338337 401531	Railway Sidings	1851

Any records that have been identified are represented on the Railways and Tunnels Map.

7.3 Historical Railways

This data is derived from OpenStreetMap and provides information on the possible alignments of abandoned or dismantled railway lines in proximity to the study site.

Have any historical railway lines been identified within the study site boundary? No

Have any historical railway lines been identified within 250m of the study site boundary? No

Database searched and no data found.

Note: multiple sections of the same track may be listed in the detail above

Any records that have been identified are represented on the Railways and Tunnels Map.

7.4 Active Railways

These datasets are derived from Ordnance Survey mapping and OpenStreetMap and provide information on the possible locations of active railway lines in proximity to the study site.

Have any active railway lines been identified within the study site boundary? No

Have any active railway lines been identified within 250m of the study site boundary? Yes

Distance (m)	Direction	Name	Type
1	NW	Ormskirk Branch Line	Rail
8	NW	Not given	Multi Track
15	NW	Not given	Multi Track
20	SW	Not given	Multi Track
46	N	Not given	Multi Track

Note: multiple sections of the same track may be listed in the detail above
Any records that have been identified are represented on the Railways and Tunnels Map.

7.5 Railway Projects

These datasets provide information on the location of large scale railway projects High Speed 2 and Crossrail 1 .

Is the study site within 5km of the route of the High Speed 2 rail project? No

Is the study site within 500m of the route of the Crossrail 1 rail project? No

*Further information on proximity to these routes, the project construction status and associated works can be obtained through the purchase of a **Groundsure HS2 and Crossrail 1 Report**.*

Crossrail route data has been digitised from publicly available maps by Groundsure. The route as provided relates to the Crossrail 1 project only, and does not include any details of the Crossrail 2 project, as final details of the route for Crossrail 2 are still under consultation.

Please note that this assessment takes account of both the original Phase 2b proposed route and the amended route proposed in 2016. As the Phase 2b route is still under consultation, Groundsure are providing information on both options until the final route is formally confirmed. Practitioners should take account of this uncertainty when advising clients.

Contact Details

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info@groundsure.com



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Web: www.bgs.ac.uk

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**The Coal
Authority**

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Public information access office
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<https://www.gov.uk/government/organisations/public-health-england>
Email: enquiries@phe.gov.uk
Main switchboard: 020 7654 8000



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Getmapping PLC

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Hampshire RG27 8NW
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Website: <http://www1.getmapping.com/>



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Berkshire RG1 8DN

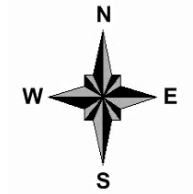
Tel: +44 (0)118 950 0761 E-mail: reading@pba.co.uk
Website: <http://www.peterbrett.com/home>



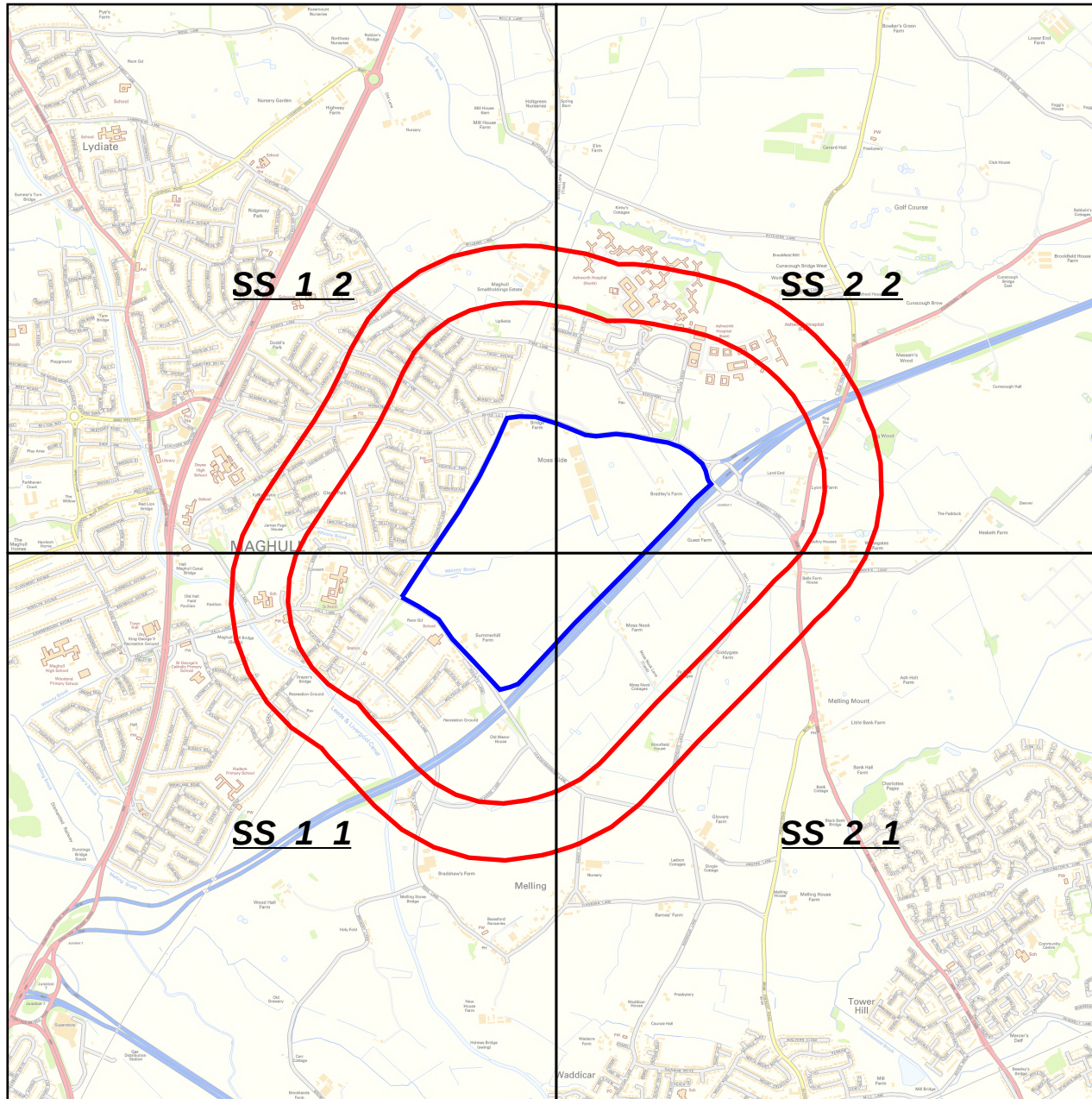
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Small Scale Grid Index



Site Details:

ASHWORTH FARM, 1, SCHOOL
LANE, LIVERPOOL, L31 1BE

Client Ref: 3013996
Report Ref: GS-3683405_SS_1_1
Grid Ref: 337991, 400717

Map Name: County Series

Map date: 1849-1850

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1846
Revised N/A
Edition 1849
Copyright N/A
Levelled N/A

Surveyed 1848
Revised N/A
Edition 1850
Copyright N/A
Levelled N/A

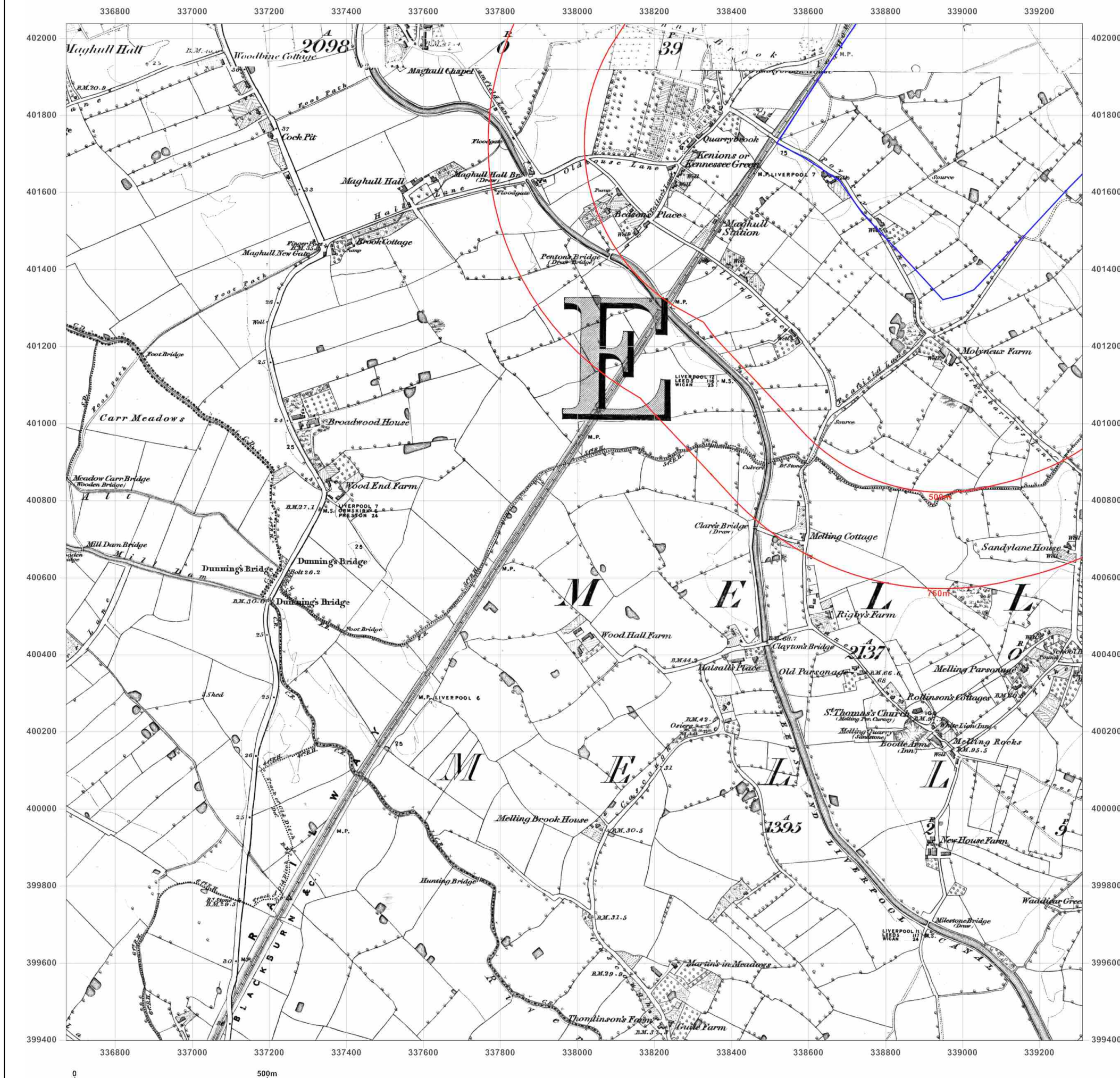


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Client Ref: 3013996
Report Ref: GS-3683405_SS_1_1
Grid Ref: 337991, 400717

Map Name: County Series

Map date: 1891-1892

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1892
Revised 1892
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1891
Revised 1891
Edition N/A
Copyright N/A
Levelled N/A

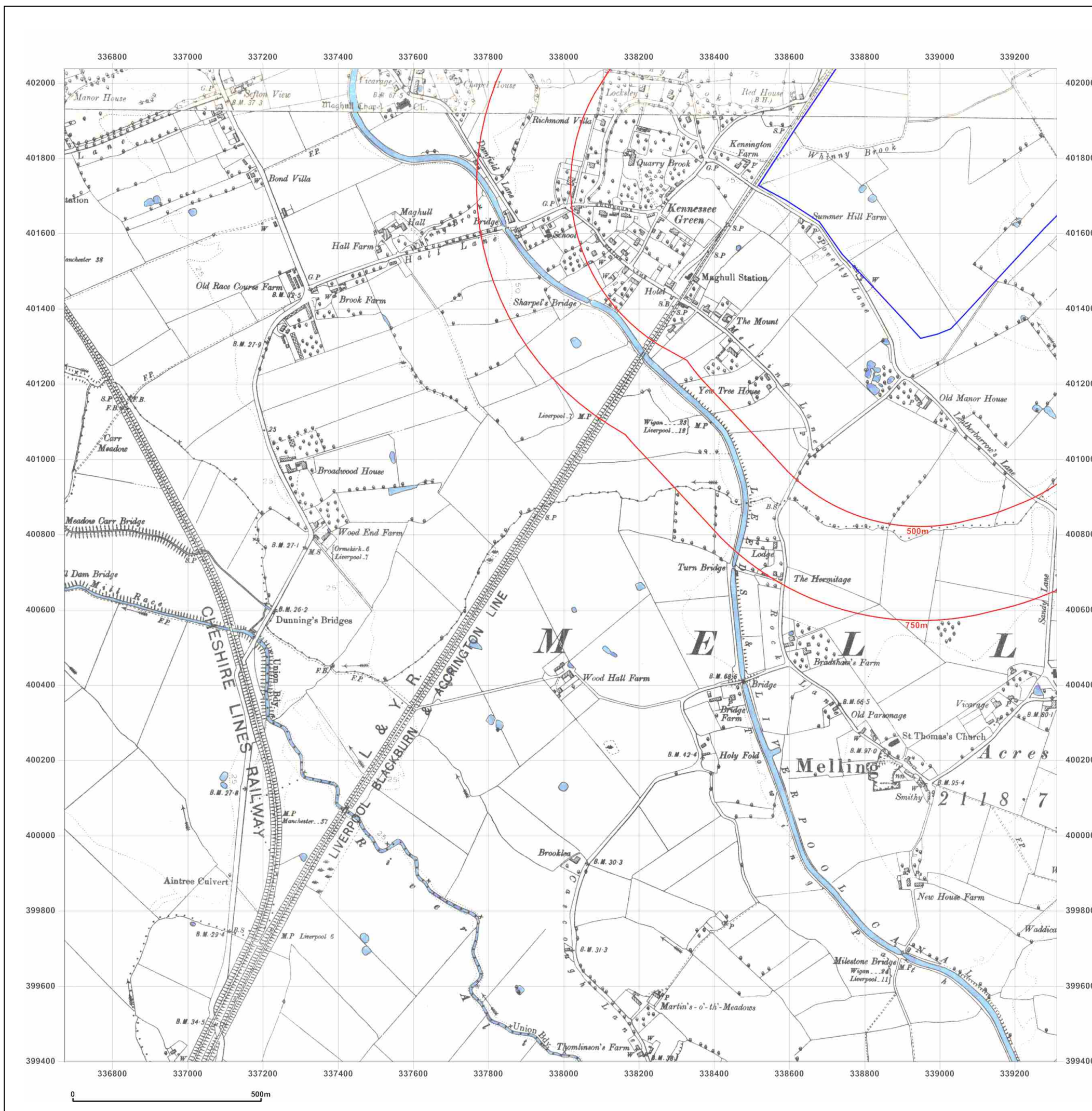


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Client Ref: 3013996
Report Ref: GS-3683405_SS_1_1
Grid Ref: 337991, 400717

Map Name: County Series

Map date: 1907

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1846
Revised 1907
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1847
Revised 1907
Edition N/A
Copyright N/A
Levelled N/A

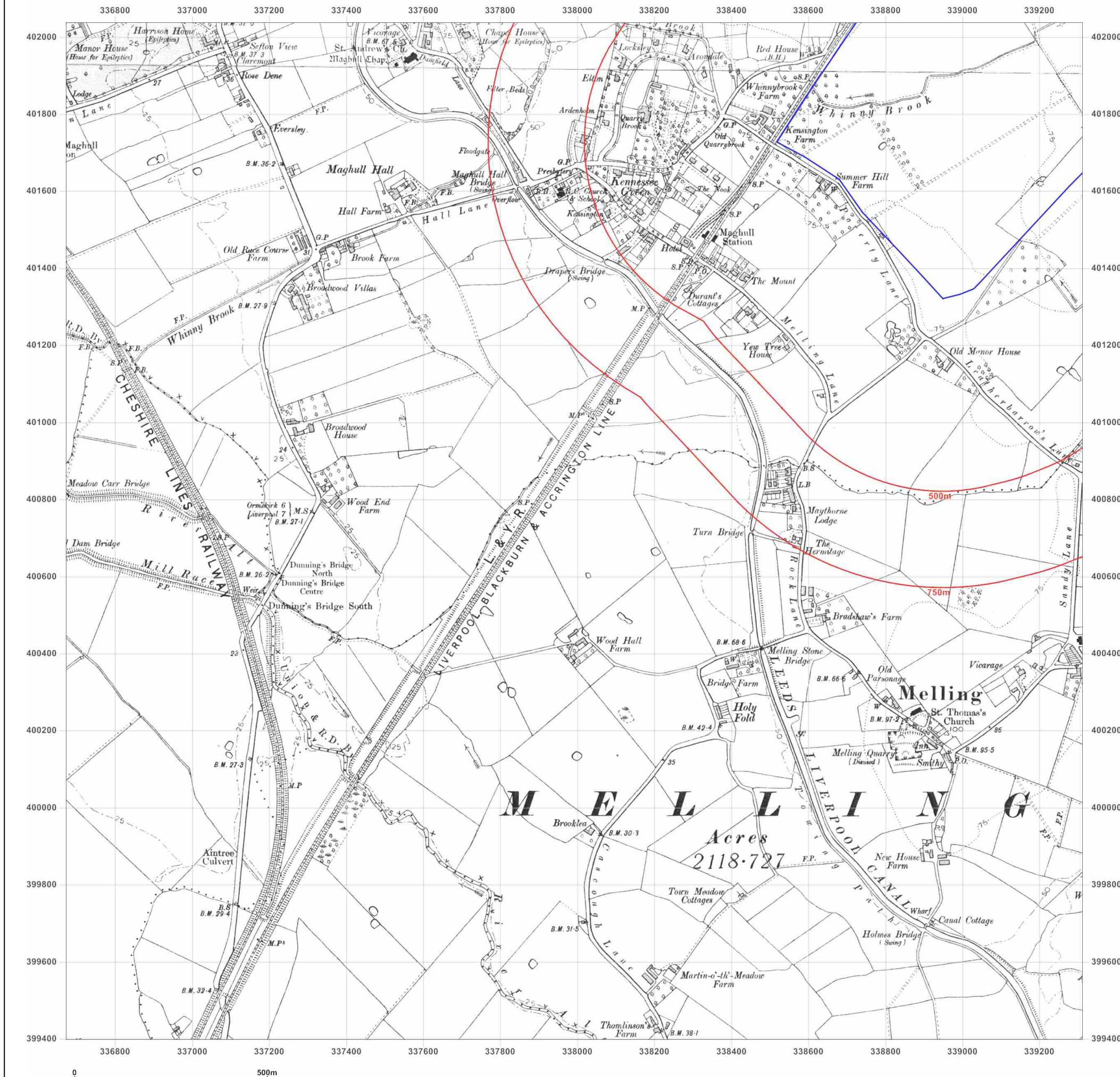


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Report Ref: GS-3683405_SS_1_1
Grid Ref: 337991, 400717

Map Name: County Series

Map date: 1925-1926

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1845
Revised 1926
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1847
Revised 1925
Edition N/A
Copyright N/A
Levelled N/A

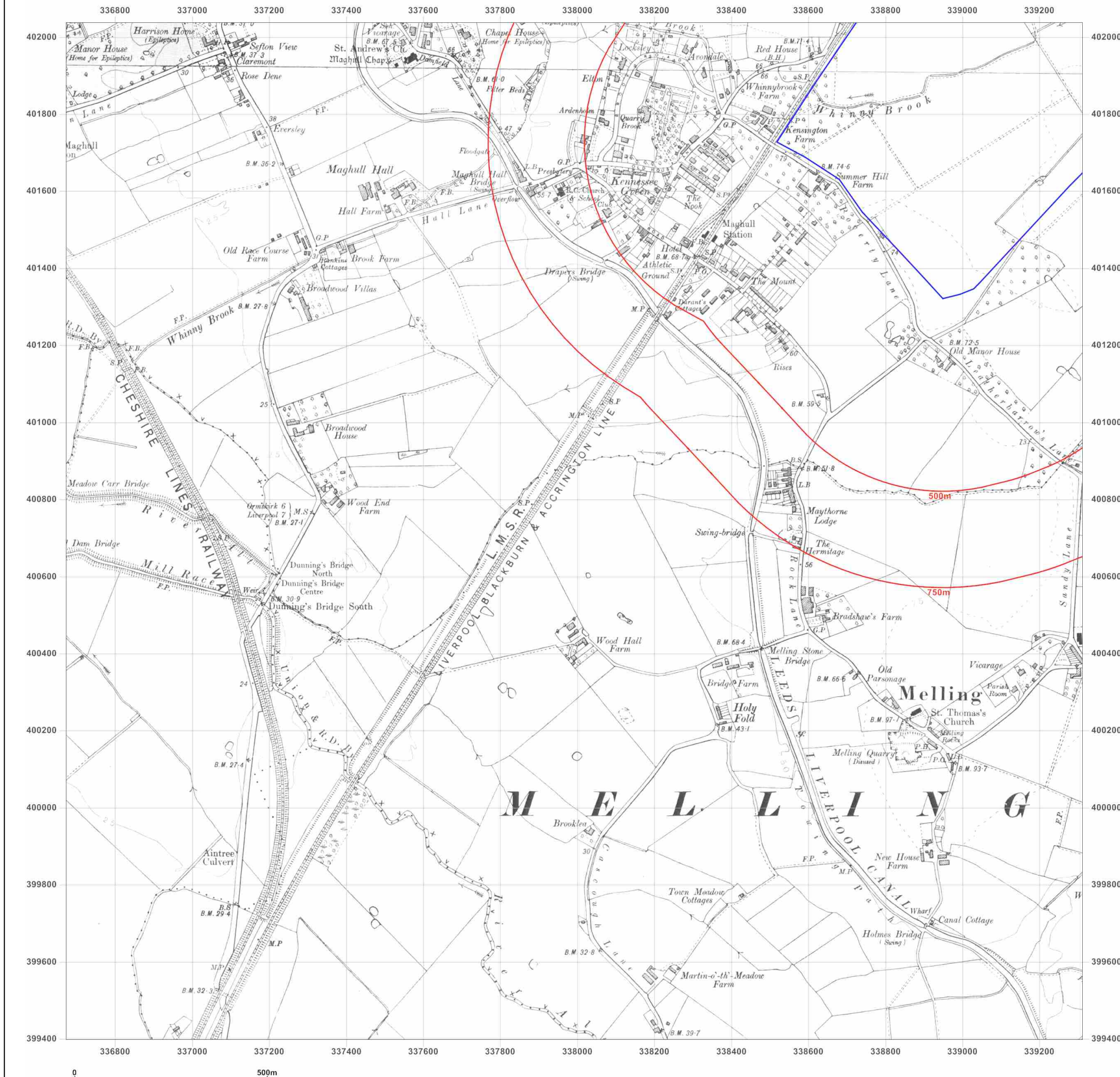


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Client Ref: 3013996
Report Ref: GS-3683405_SS_1_1
Grid Ref: 337991, 400717

Map Name: County Series

Map date: 1938

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1845
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Edition N/A
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Levelled N/A

Surveyed 1847
Revised 1938
Edition N/A
Copyright N/A
Levelled N/A

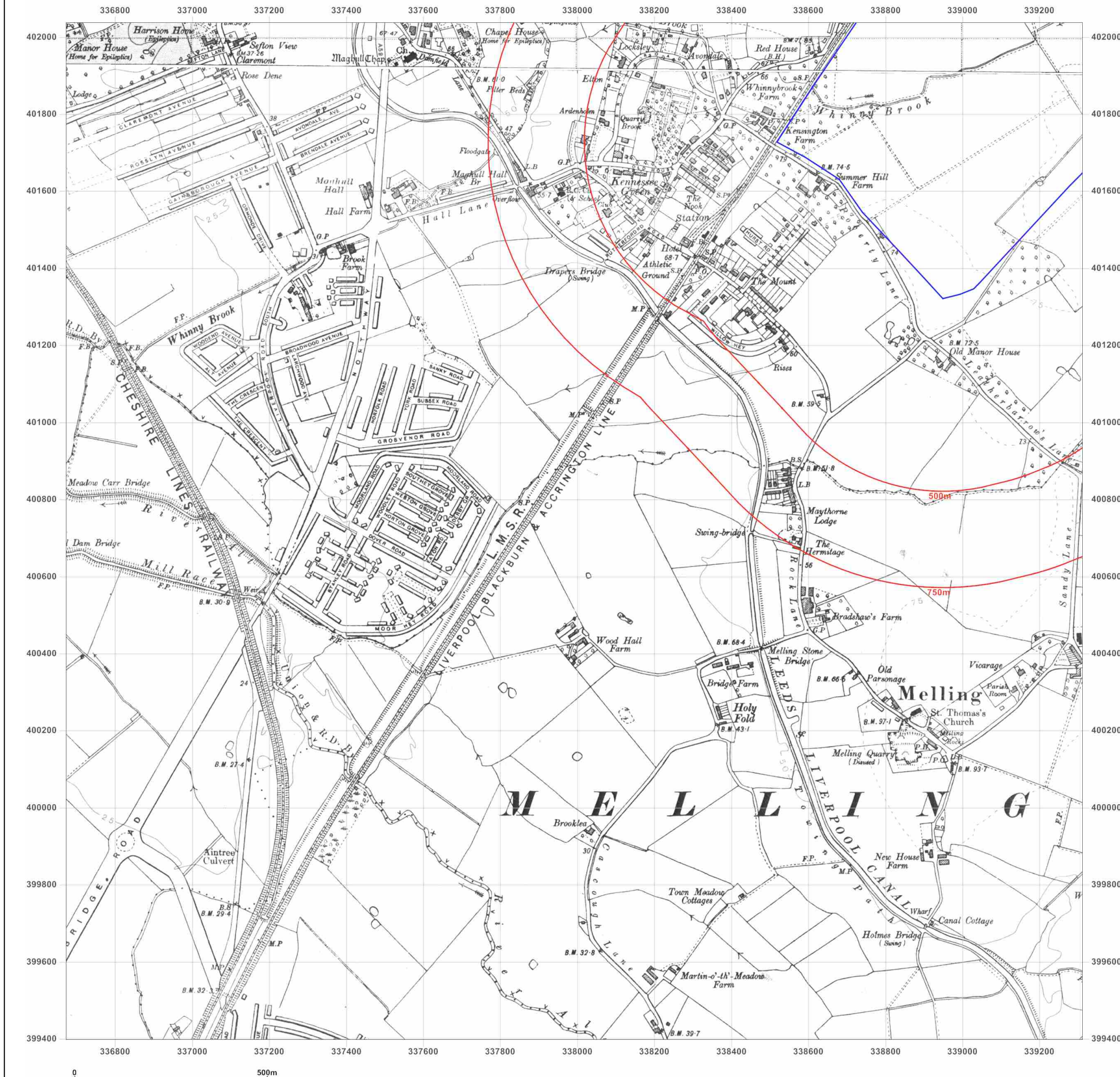


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Client Ref: 3013996
Report Ref: GS-3683405_SS_1_1
Grid Ref: 337991, 400717

Map Name: Provisional

Map date: 1955-1956

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1949
Revised 1955
Edition N/A
Copyright N/A
Levelled N/A

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

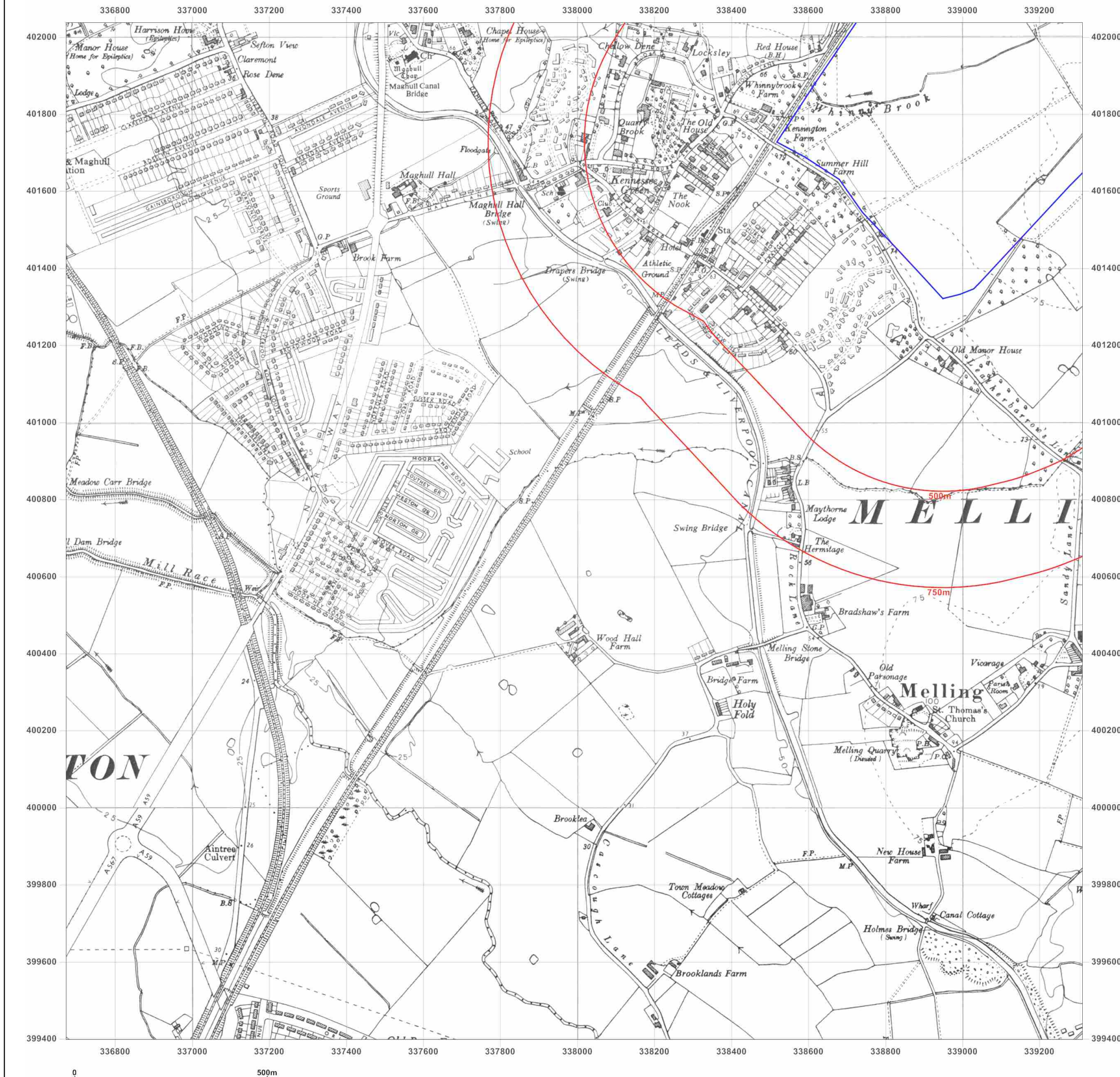


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Client Ref: 3013996
Report Ref: GS-3683405_SS_1_1
Grid Ref: 337991, 400717

Map Name: Provisional

Map date: 1967-1968

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1949
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Edition N/A
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Surveyed 1967
Revised 1967
Edition N/A
Copyright N/A
Levelled N/A

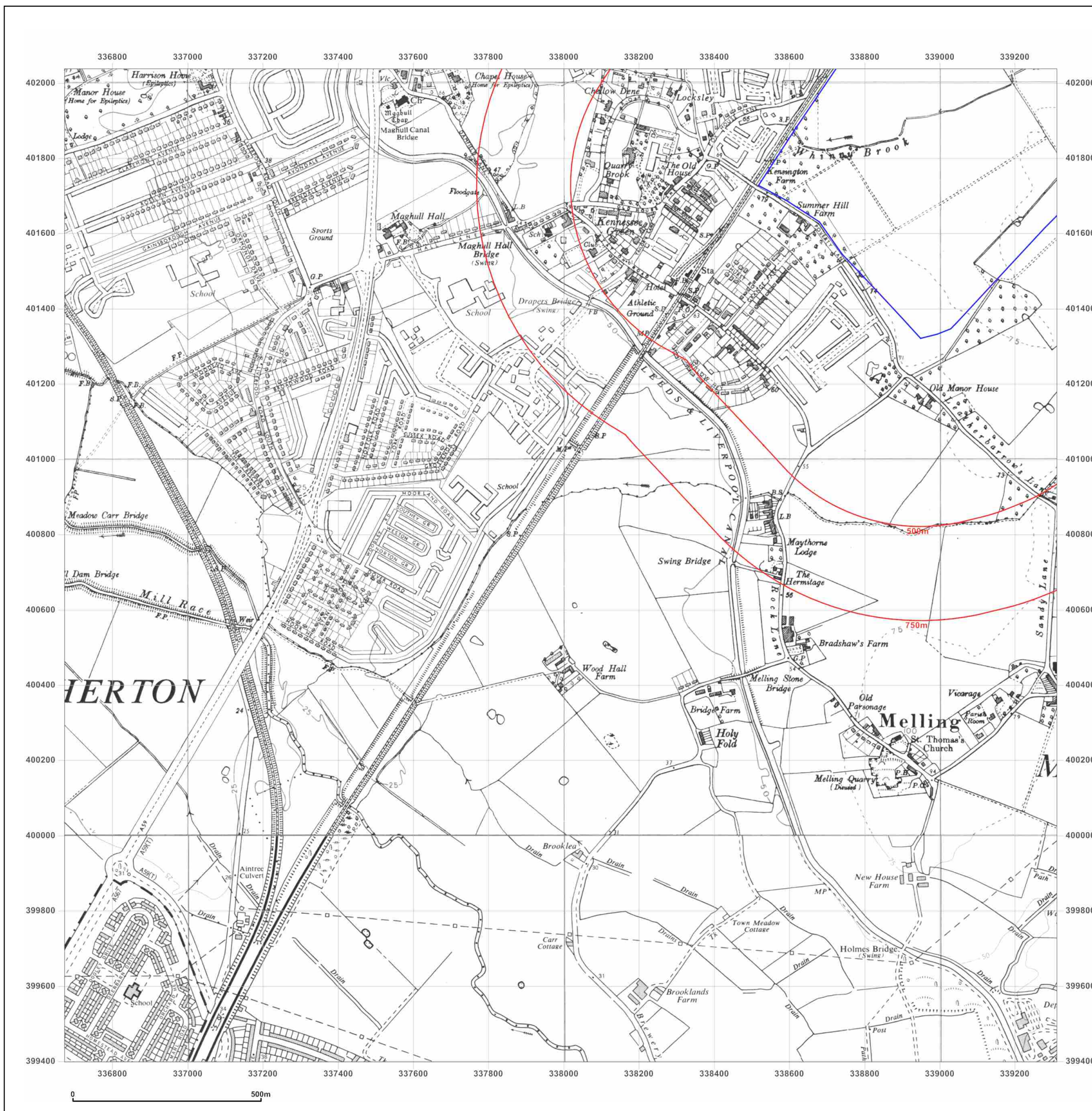


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Client Ref: 3013996
Report Ref: GS-3683405_SS_1_1
Grid Ref: 337991, 400717

Map Name: National Grid

Map date: 1974

Scale: 1:10,000

Printed at: 1:10,000



Surveyed 1973
Revised 1974
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1973
Revised 1973
Edition N/A
Copyright 1974
Levelled 1964

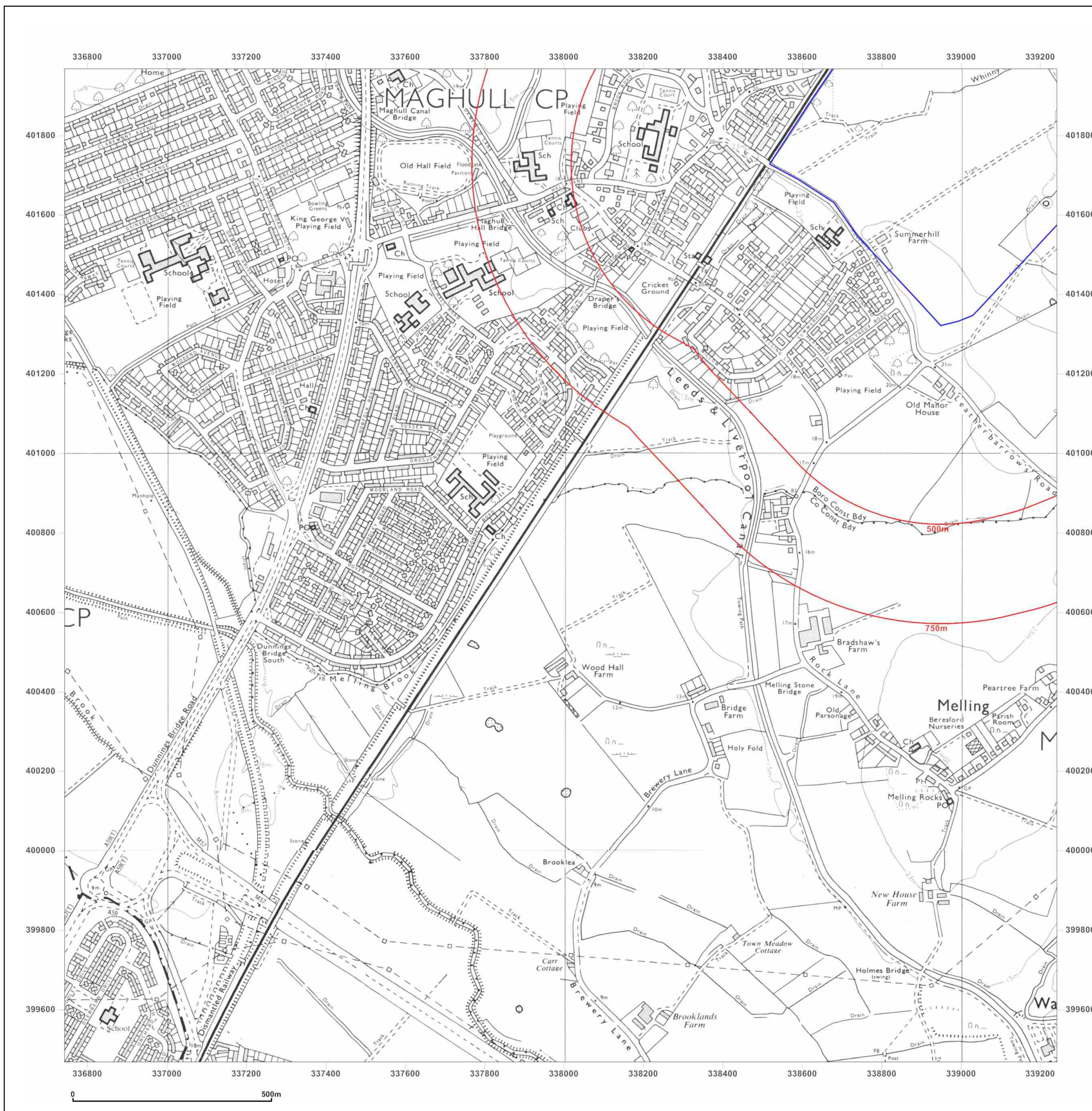


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Report Ref: GS-3683405_SS_1_1
Grid Ref: 337991, 400717

Map Name: National Grid

Map date: 1985-1987

Scale: 1:10,000

Printed at: 1:10,000



Surveyed 1984
Revised 1985
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1983
Revised 1987
Edition N/A
Copyright N/A
Levelled N/A

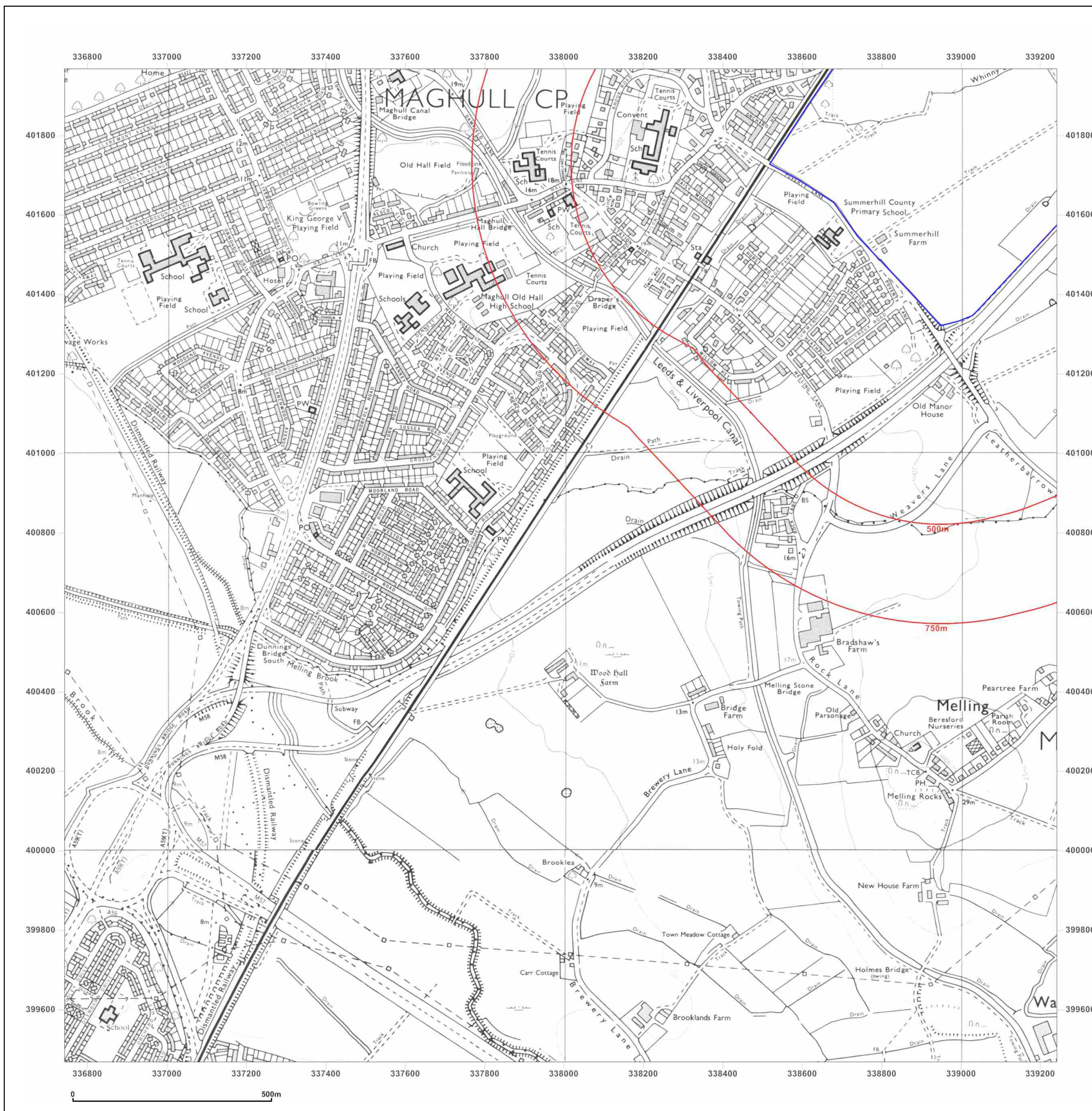


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Site Details:

ASHWORTH FARM, 1, SCHOOL
LANE, LIVERPOOL, L31 1BE

Client Ref: 3013996
Report Ref: GS-3683405_SS_1_1
Grid Ref: 337991, 400717

Map Name: 1:10,000 Raster

Map date: 2002

Scale: 1:10,000

Printed at: 1:10,000



2002



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Site Details:

ASHWORTH FARM, 1, SCHOOL
LANE, LIVERPOOL, L31 1BE

Client Ref: 3013996
Report Ref: GS-3683405_SS_1_1
Grid Ref: 337991, 400717

Map Name: National Grid

Map date: 2010

Scale: 1:10,000

Printed at: 1:10,000



2010

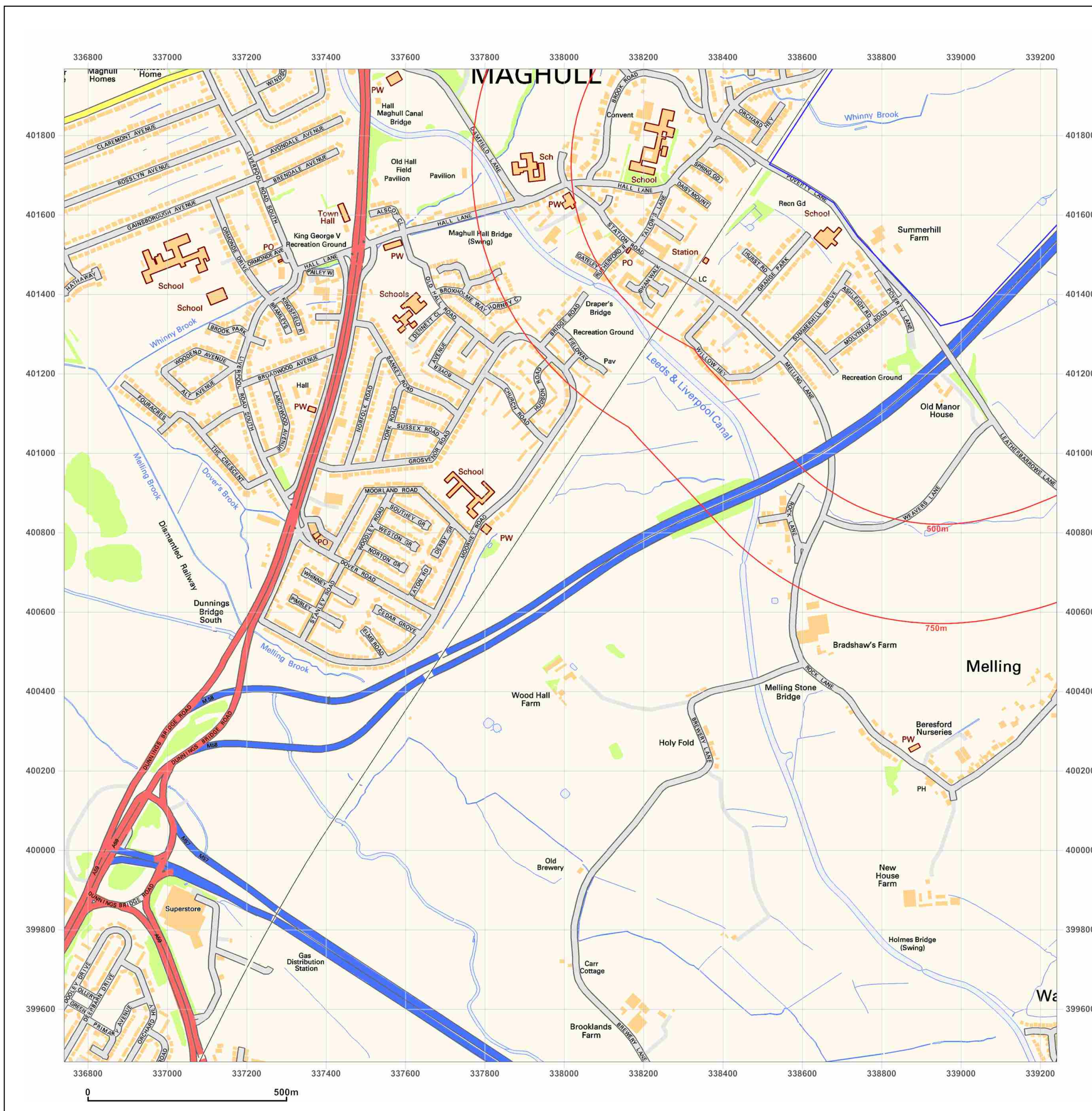


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Site Details:

ASHWORTH FARM, 1, SCHOOL
LANE, LIVERPOOL, L31 1BE

Client Ref: 3013996
Report Ref: GS-3683405_SS_1_1
Grid Ref: 337991, 400717

Map Name: National Grid

Map date: 2014

Scale: 1:10,000

Printed at: 1:10,000



2014

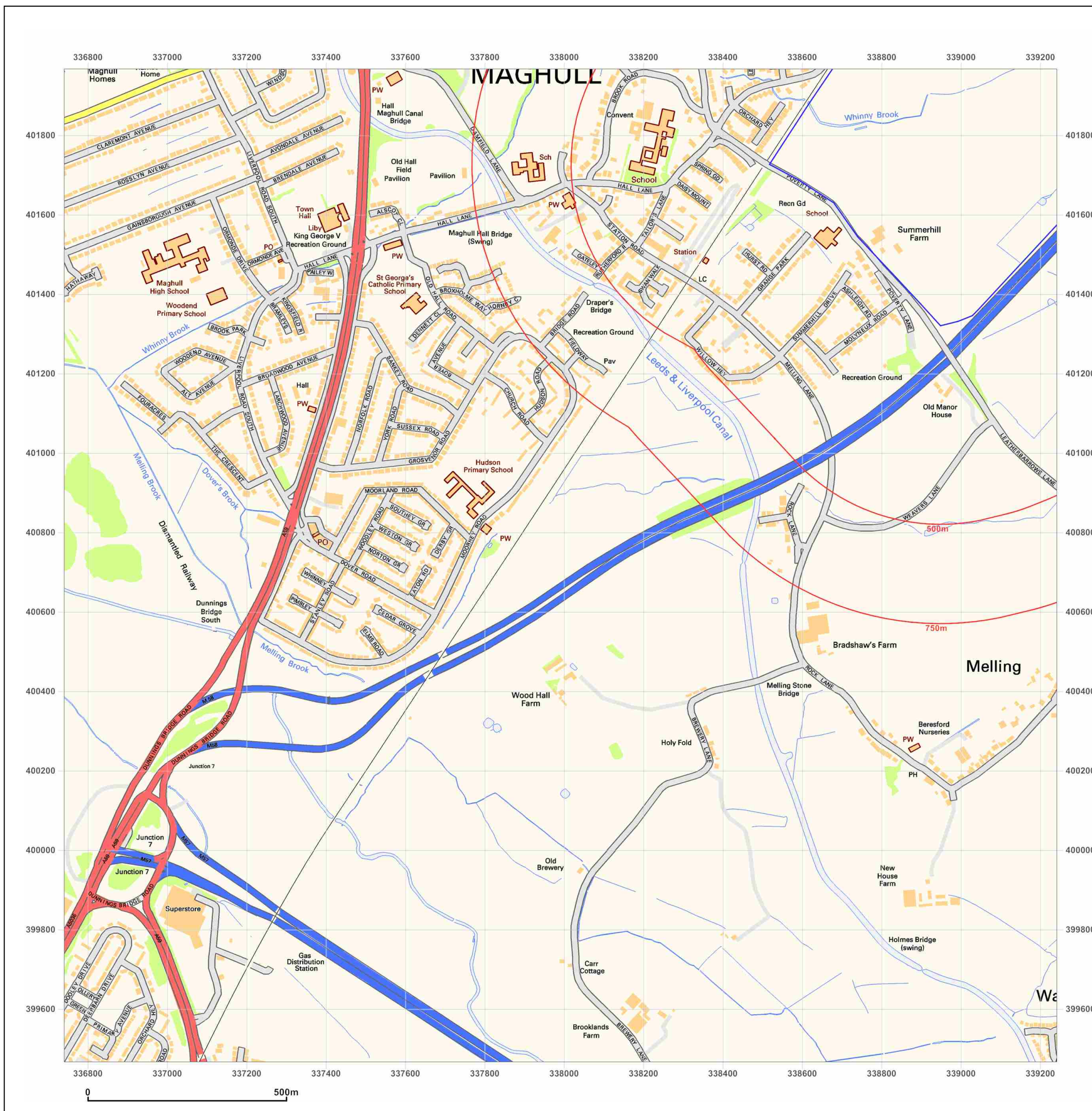


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Site Details:

ASHWORTH FARM, 1, SCHOOL
LANE, LIVERPOOL, L31 1BE

Client Ref: 3013996
Report Ref: GS-3683405_SS_1_2
Grid Ref: 337991, 403127

Map Name: County Series

Map date: 1849-1850

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1846
Revised N/A
Edition 1849
Copyright N/A
Levelled N/A

Surveyed 1848
Revised N/A
Edition 1850
Copyright N/A
Levelled N/A

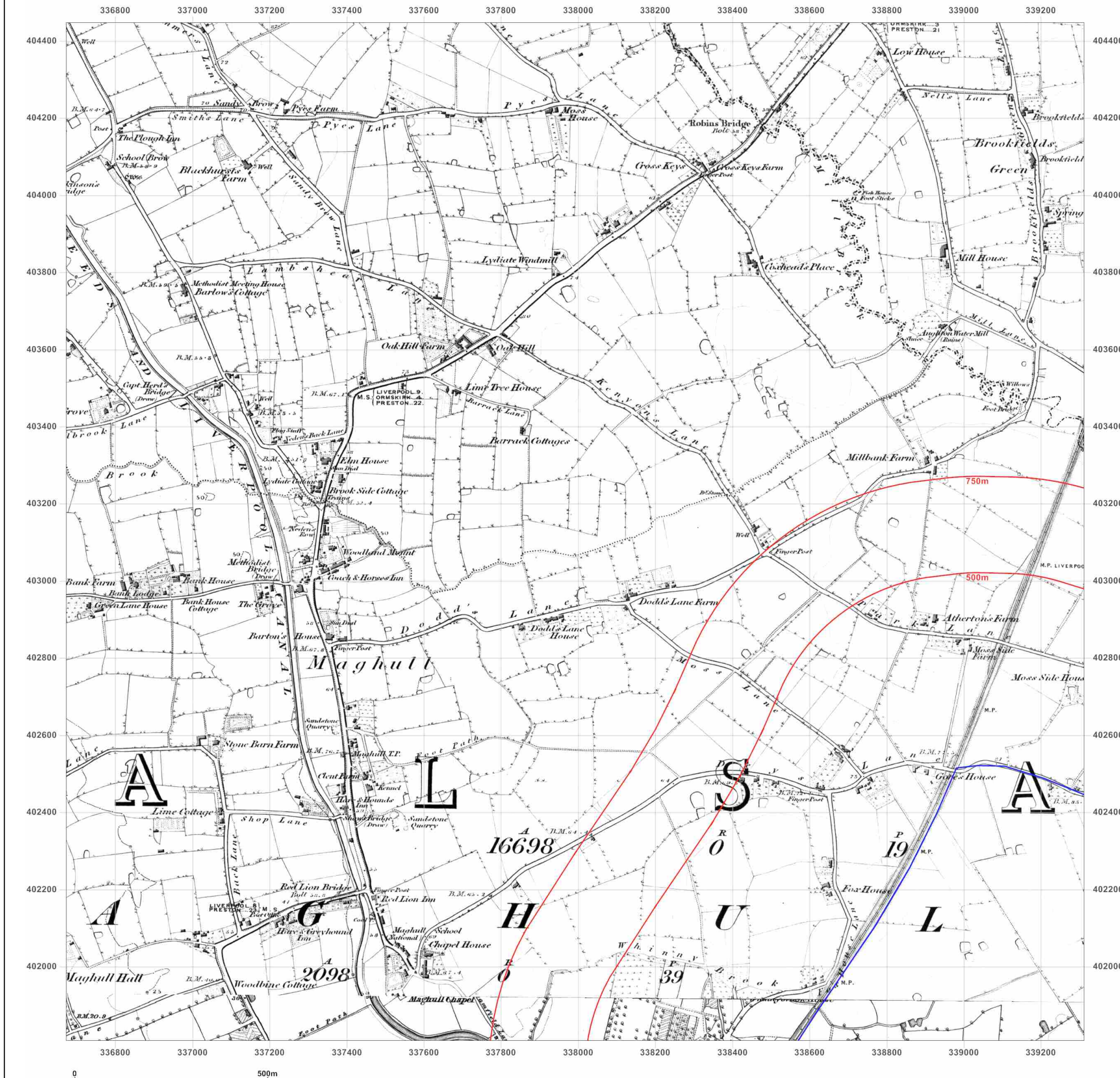


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Production date: 24 February 2017

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Site Details:

ASHWORTH FARM, 1, SCHOOL
LANE, LIVERPOOL, L31 1BE

Client Ref: 3013996
Report Ref: GS-3683405_SS_1_2
Grid Ref: 337991, 403127

Map Name: County Series

Map date: 1892

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1892
Revised 1892
Edition N/A
Copyright N/A
Levelled N/A

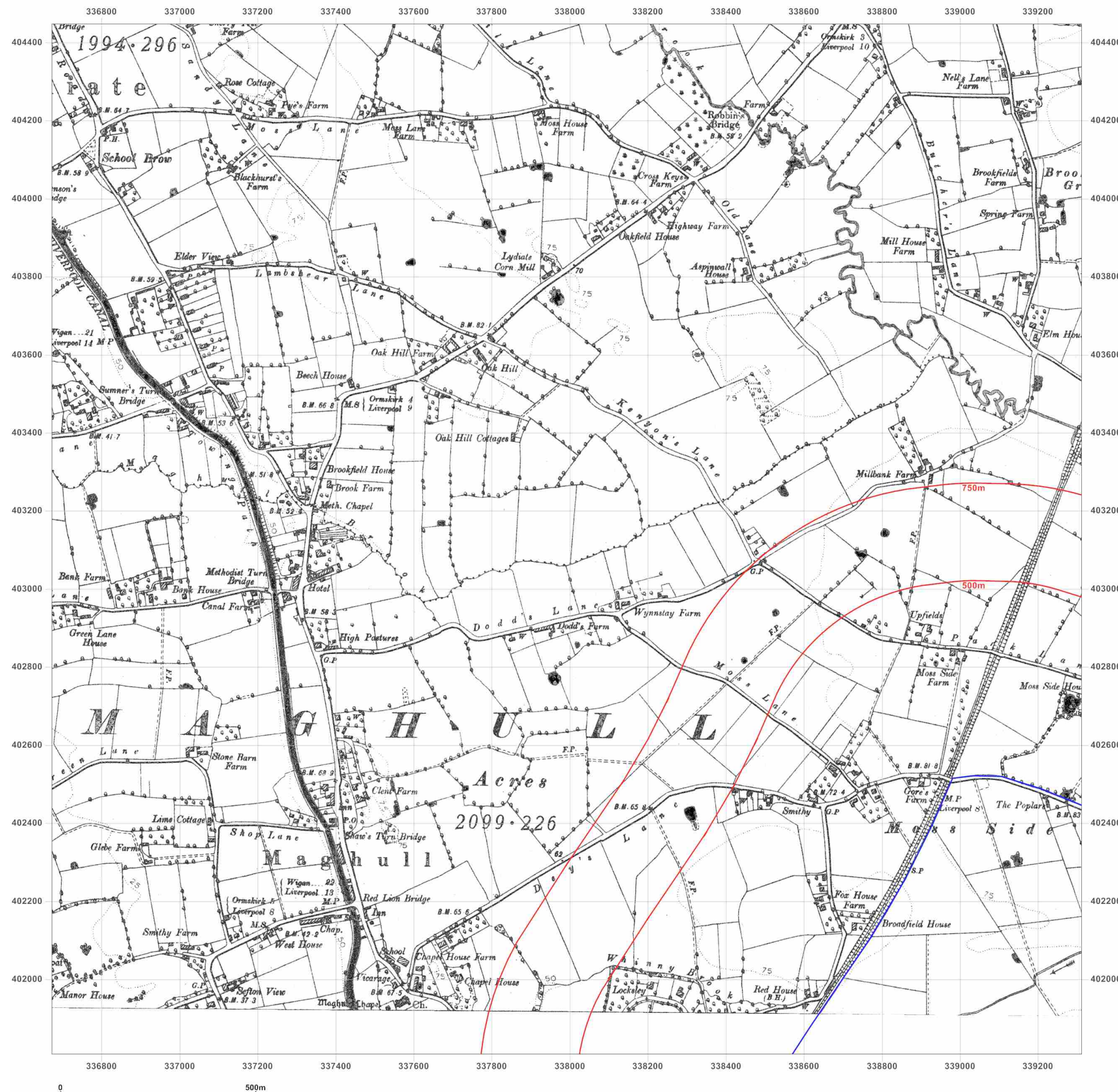


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Production date: 24 February 2017

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Site Details:

ASHWORTH FARM, 1, SCHOOL
LANE, LIVERPOOL, L31 1BE

Client Ref: 3013996
Report Ref: GS-3683405_SS_1_2
Grid Ref: 337991, 403127

Map Name: County Series

Map date: 1891-1892

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1892
Revised 1892
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1891
Revised 1891
Edition N/A
Copyright N/A
Levelled N/A

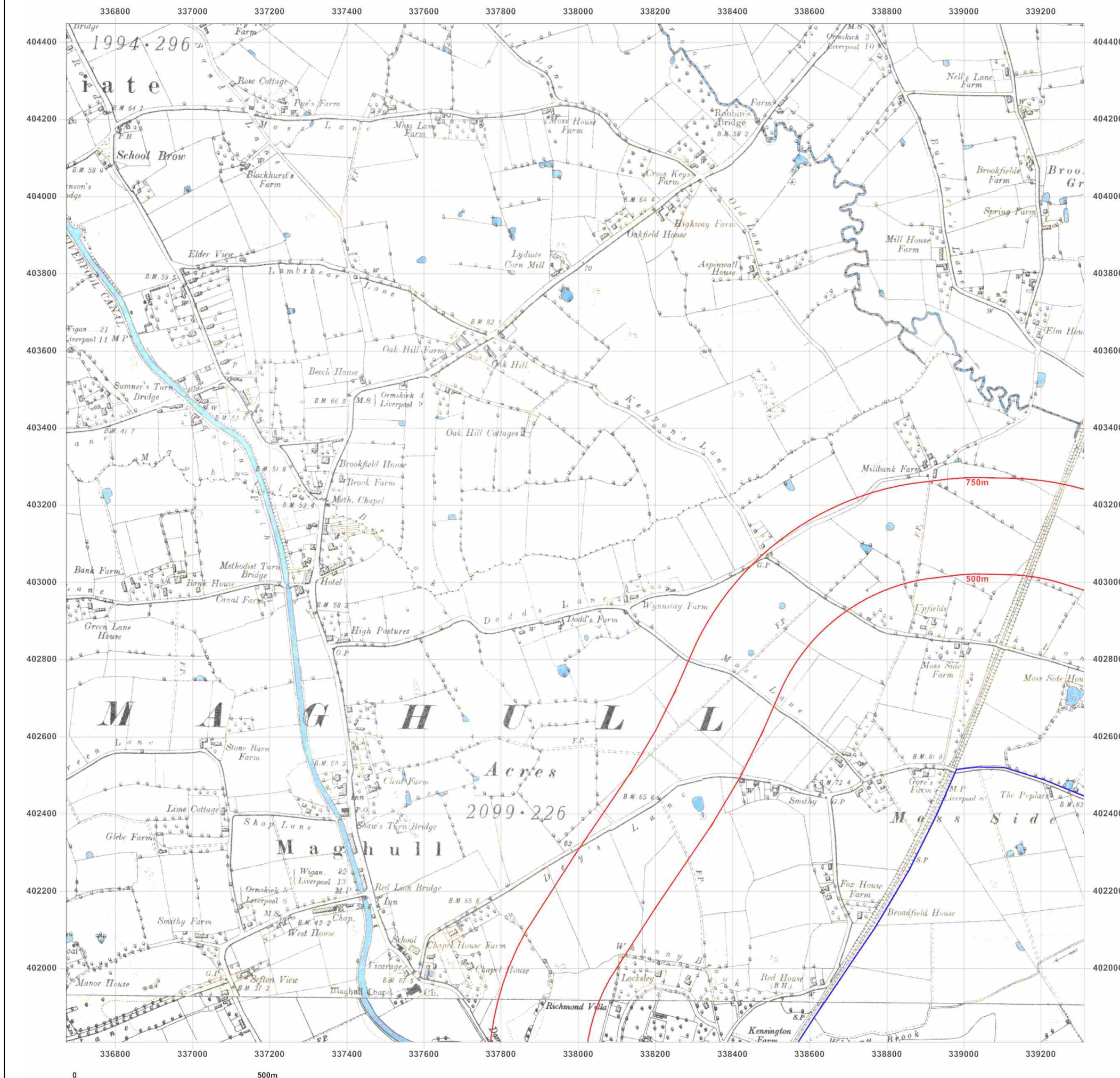


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Client Ref: 3013996
Report Ref: GS-3683405_SS_1_2
Grid Ref: 337991, 403127

Map Name: County Series

Map date: 1907

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1846
Revised 1907
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1847
Revised 1907
Edition N/A
Copyright N/A
Levelled N/A

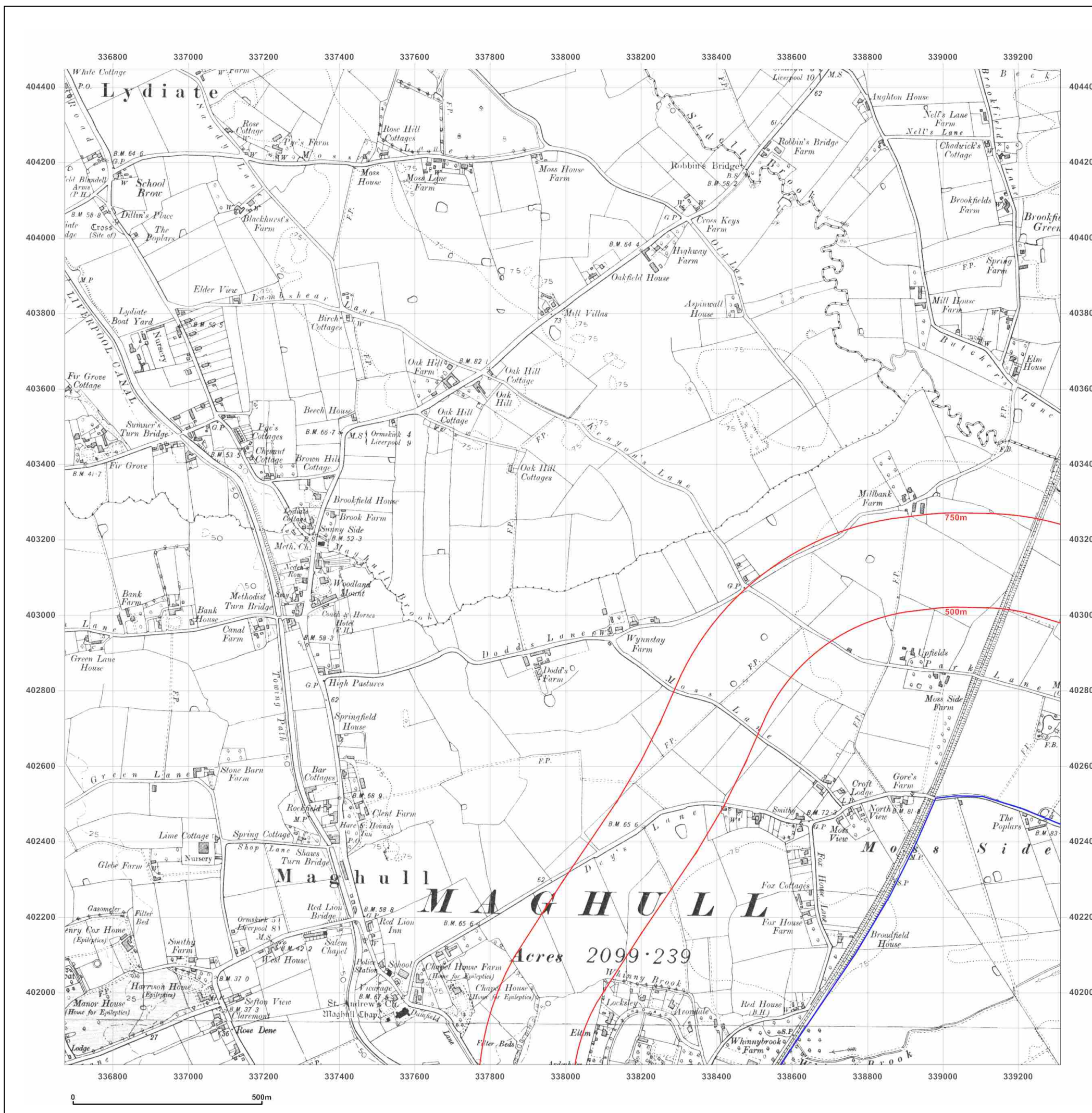


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Site Details:

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Client Ref: 3013996
Report Ref: GS-3683405_SS_1_2
Grid Ref: 337991, 403127

Map Name: County Series

Map date: 1925-1926

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1845
Revised 1926
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1847
Revised 1925
Edition N/A
Copyright N/A
Levelled N/A

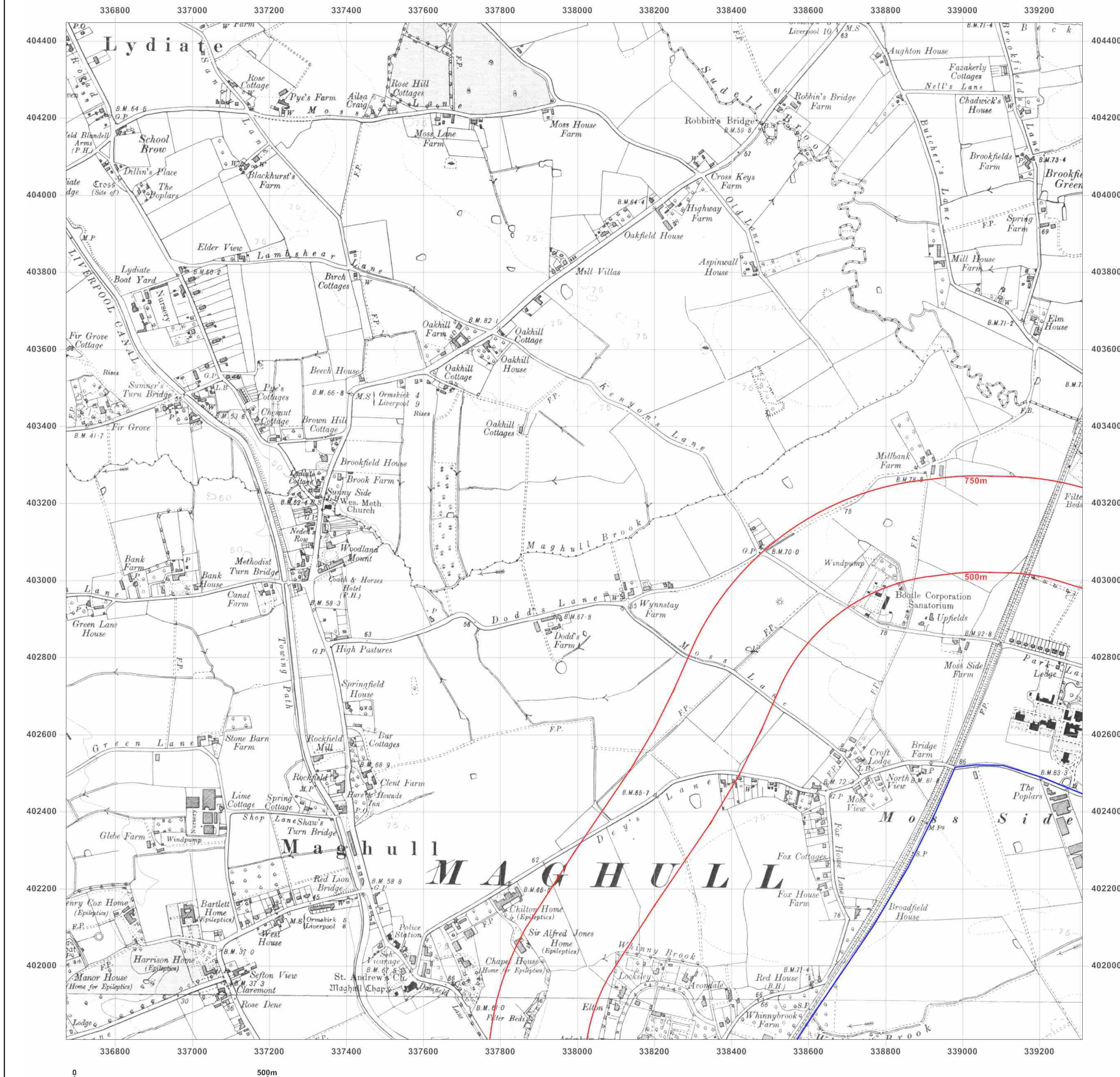


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Site Details:

ASHWORTH FARM, 1, SCHOOL
LANE, LIVERPOOL, L31 1BE

Client Ref: 3013996
Report Ref: GS-3683405_SS_1_2
Grid Ref: 337991, 403127

Map Name: County Series

Map date: 1938

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1845
Revised 1938
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1847
Revised 1938
Edition N/A
Copyright N/A
Levelled N/A

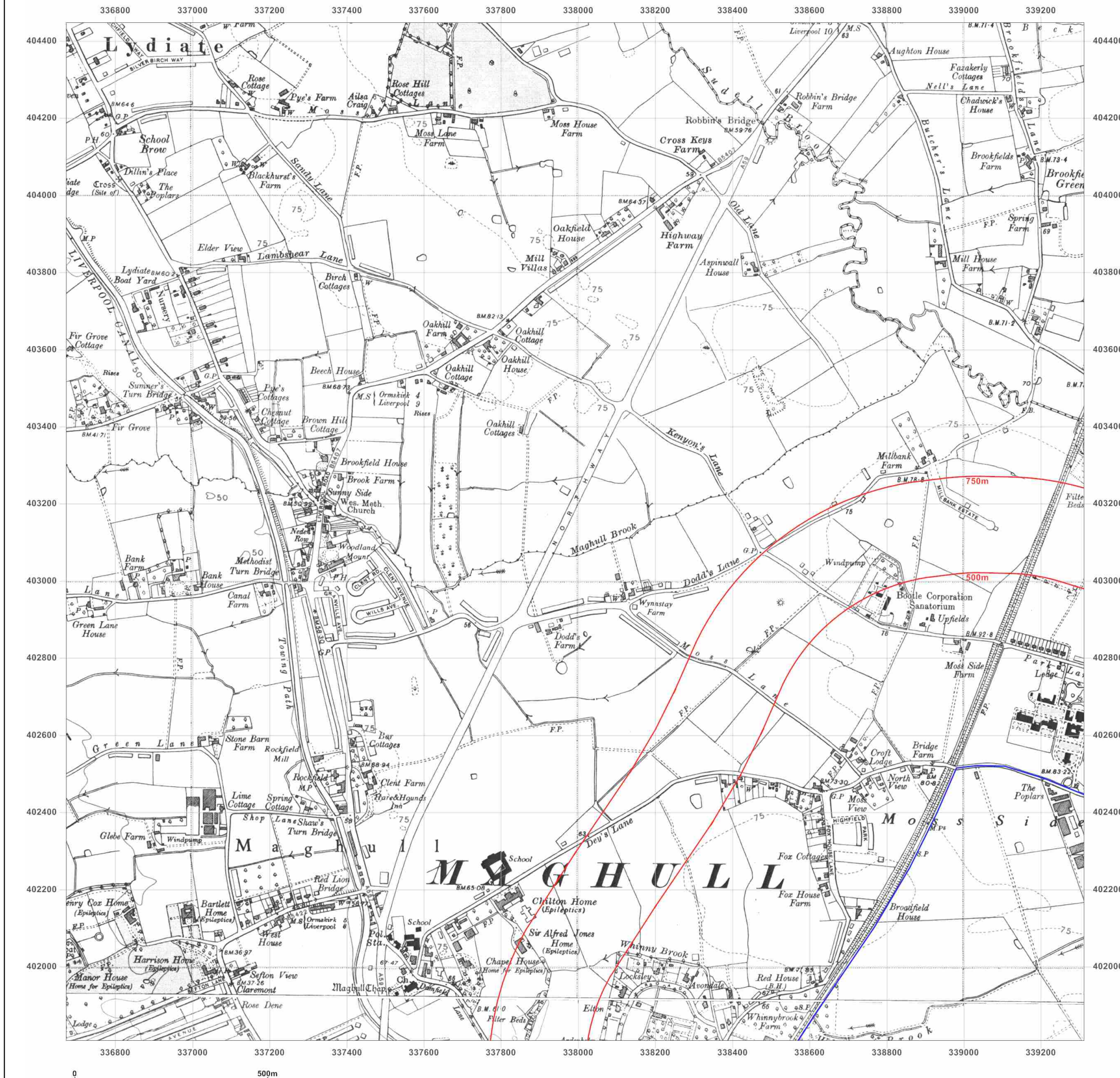


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Site Details:

ASHWORTH FARM, 1, SCHOOL
LANE, LIVERPOOL, L31 1BE

Client Ref: 3013996
Report Ref: GS-3683405_SS_1_2
Grid Ref: 337991, 403127

Map Name: Provisional

Map date: 1955

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1949
Revised 1955
Edition N/A
Copyright N/A
Levelled N/A

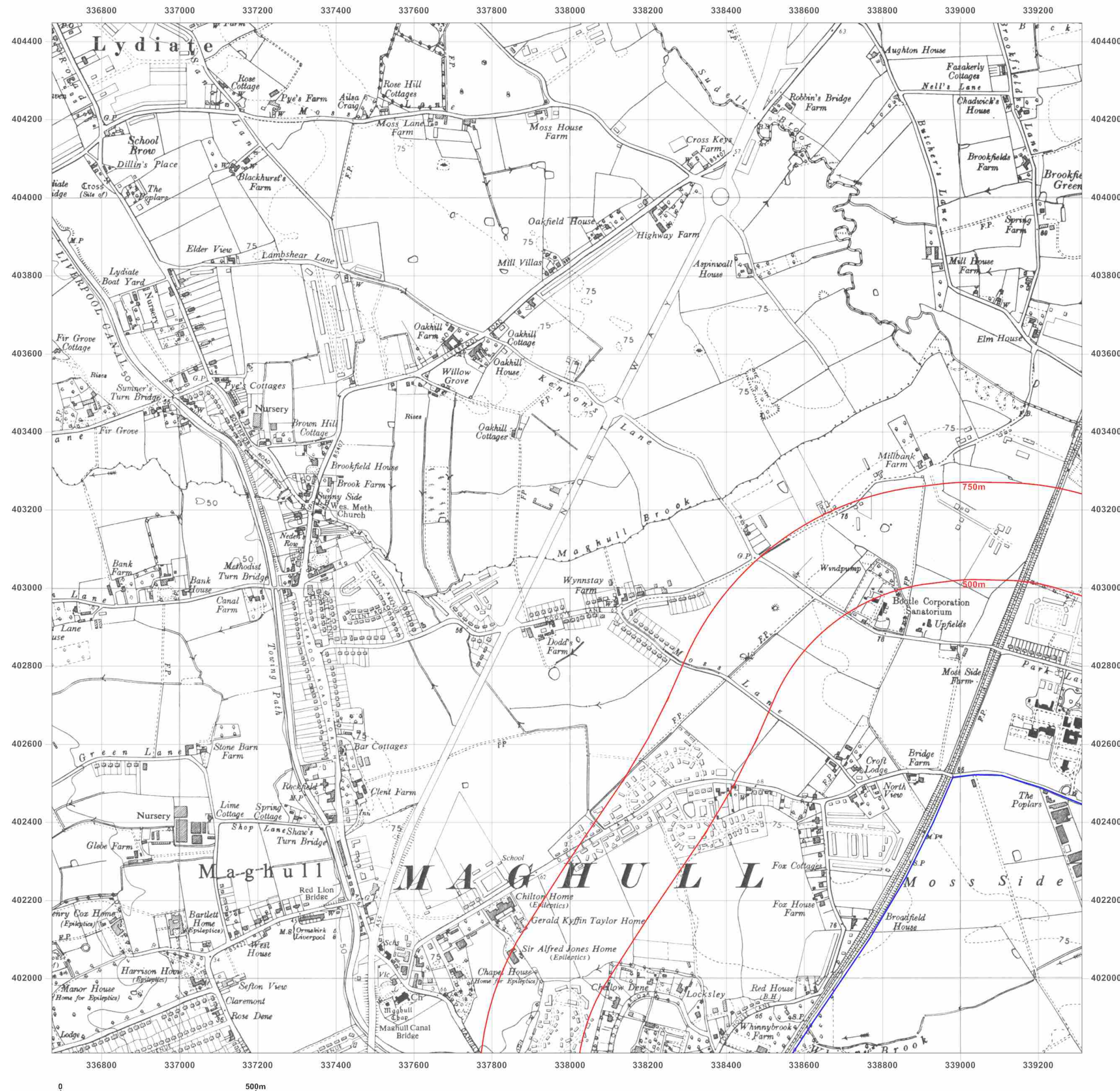


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Site Details:

ASHWORTH FARM, 1, SCHOOL
LANE, LIVERPOOL, L31 1BE

Client Ref: 3013996
Report Ref: GS-3683405_SS_1_2
Grid Ref: 337991, 403127

Map Name: Provisional

Map date: 1968

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1949
Revised 1968
Edition N/A
Copyright N/A
Levelled N/A

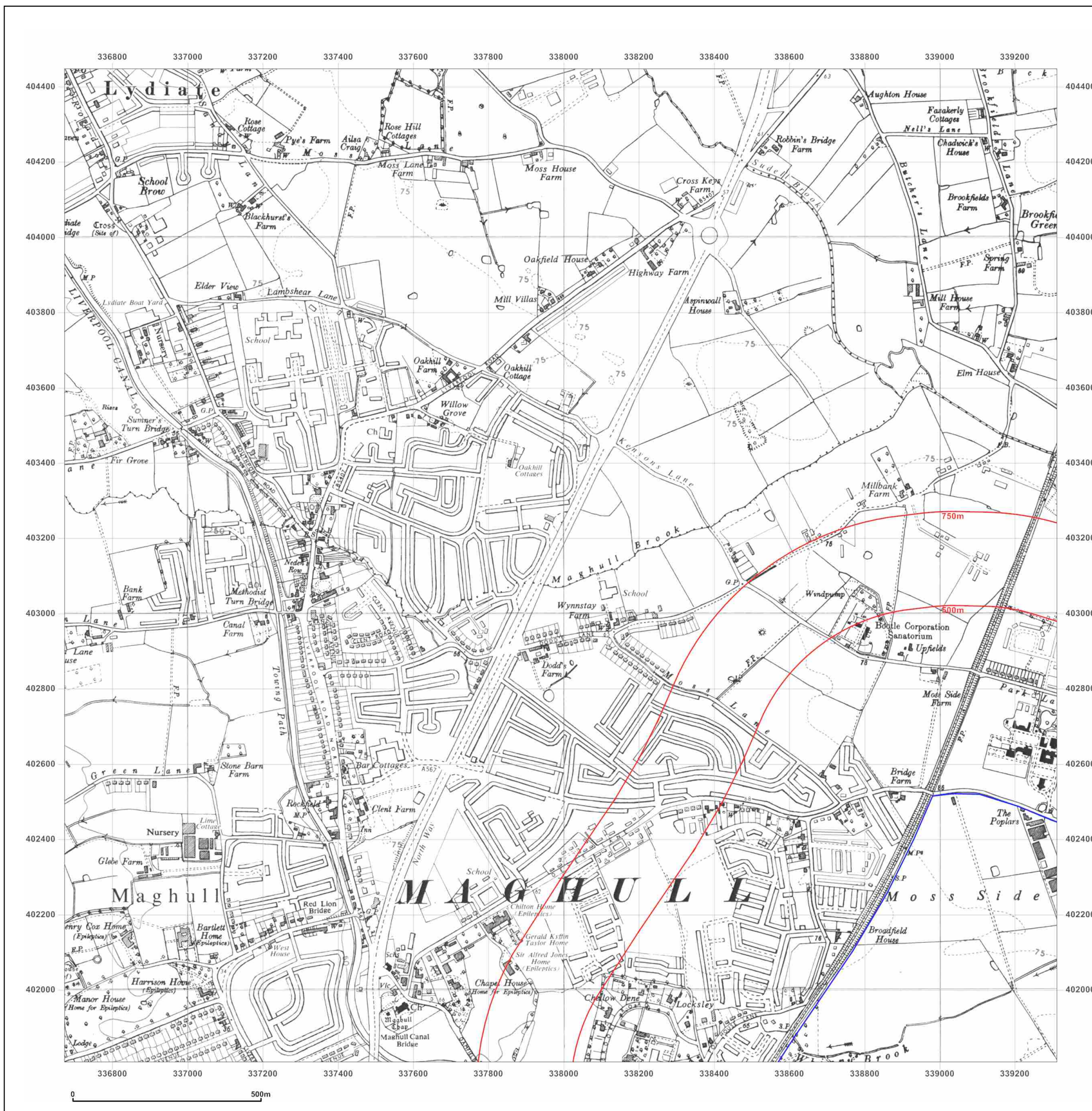


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Site Details:

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Client Ref: 3013996
Report Ref: GS-3683405_SS_1_2
Grid Ref: 337991, 403127

Map Name: National Grid

Map date: 1974

Scale: 1:10,000

Printed at: 1:10,000



Surveyed 1973
Revised 1974
Edition N/A
Copyright N/A
Levelled N/A

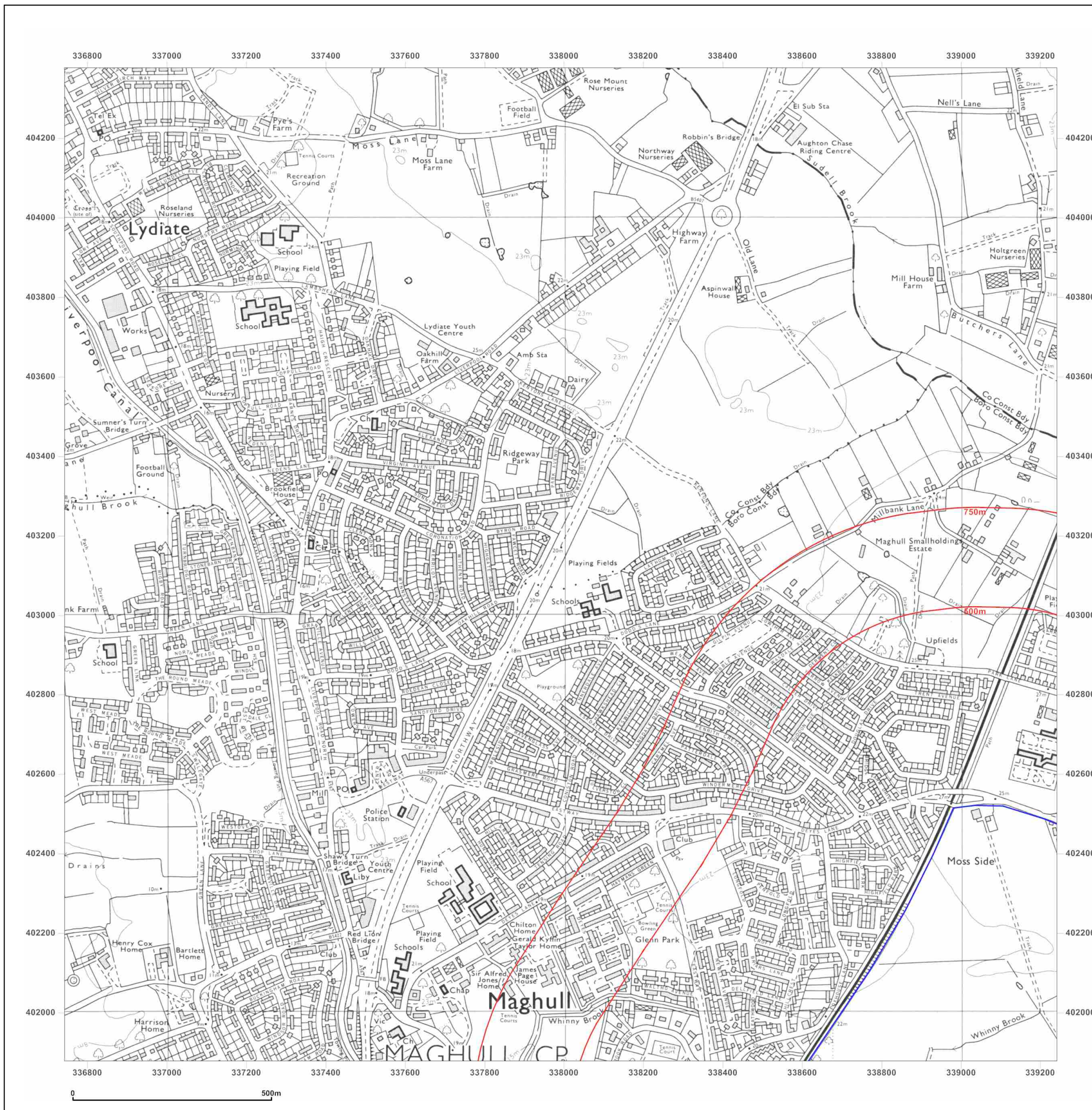


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Site Details:

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Client Ref: 3013996
Report Ref: GS-3683405_SS_1_2
Grid Ref: 337991, 403127

Map Name: National Grid

Map date: 1985

Scale: 1:10,000

Printed at: 1:10,000



Surveyed 1984
Revised 1985
Edition N/A
Copyright N/A
Levelled N/A



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Site Details:

ASHWORTH FARM, 1, SCHOOL
LANE, LIVERPOOL, L31 1BE

Client Ref: 3013996
Report Ref: GS-3683405_SS_1_2
Grid Ref: 337991, 403127

Map Name: 1:10,000 Raster

Map date: 2002

Scale: 1:10,000

Printed at: 1:10,000



2002



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Site Details:

ASHWORTH FARM, 1, SCHOOL
LANE, LIVERPOOL, L31 1BE

Client Ref: 3013996
Report Ref: GS-3683405_SS_1_2
Grid Ref: 337991, 403127

Map Name: National Grid

Map date: 2010

Scale: 1:10,000

Printed at: 1:10,000



2010

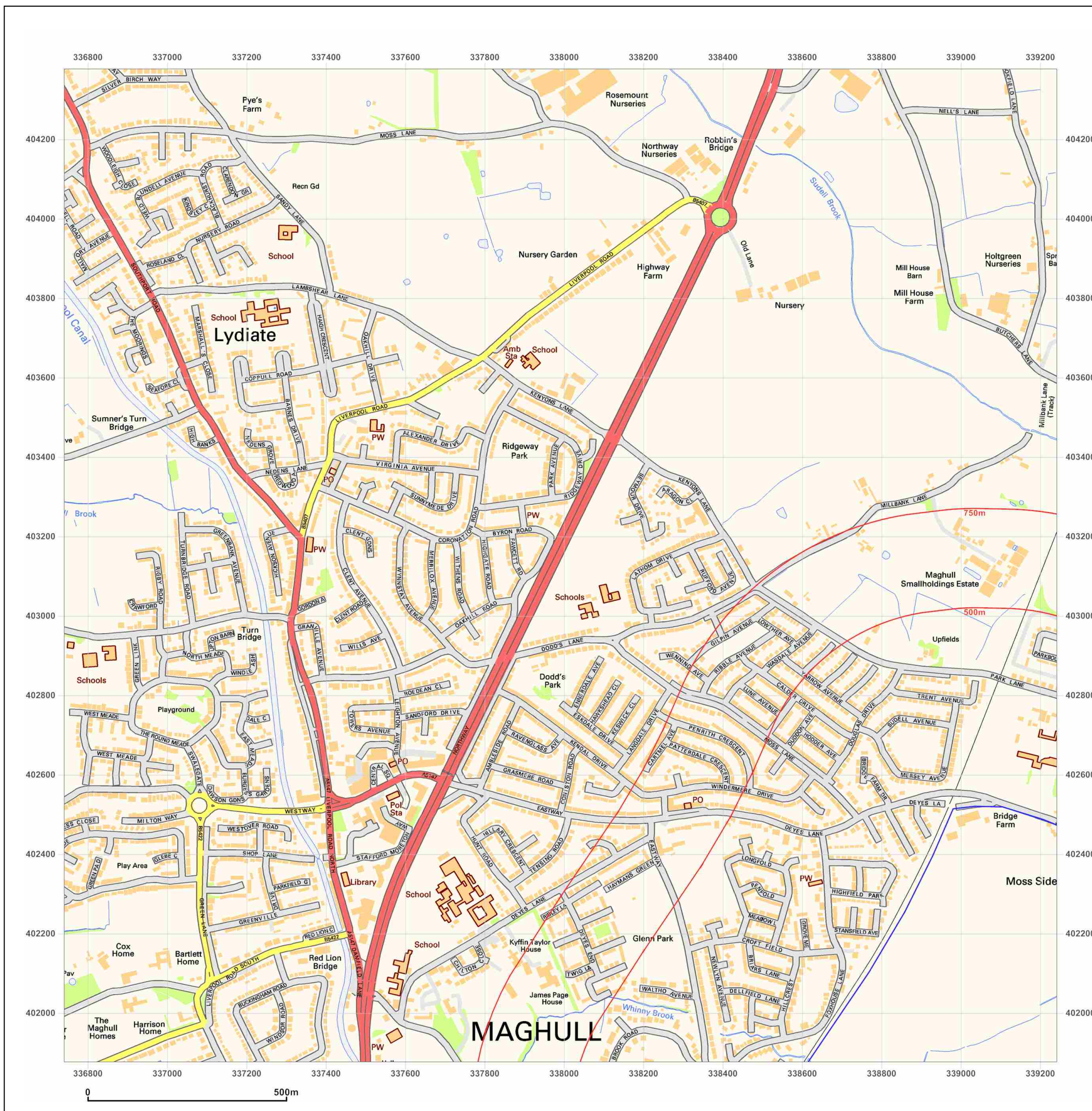


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Site Details:

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LANE, LIVERPOOL, L31 1BE

Client Ref: 3013996
Report Ref: GS-3683405_SS_1_2
Grid Ref: 337991, 403127

Map Name: National Grid

Map date: 2014

Scale: 1:10,000

Printed at: 1:10,000



2014

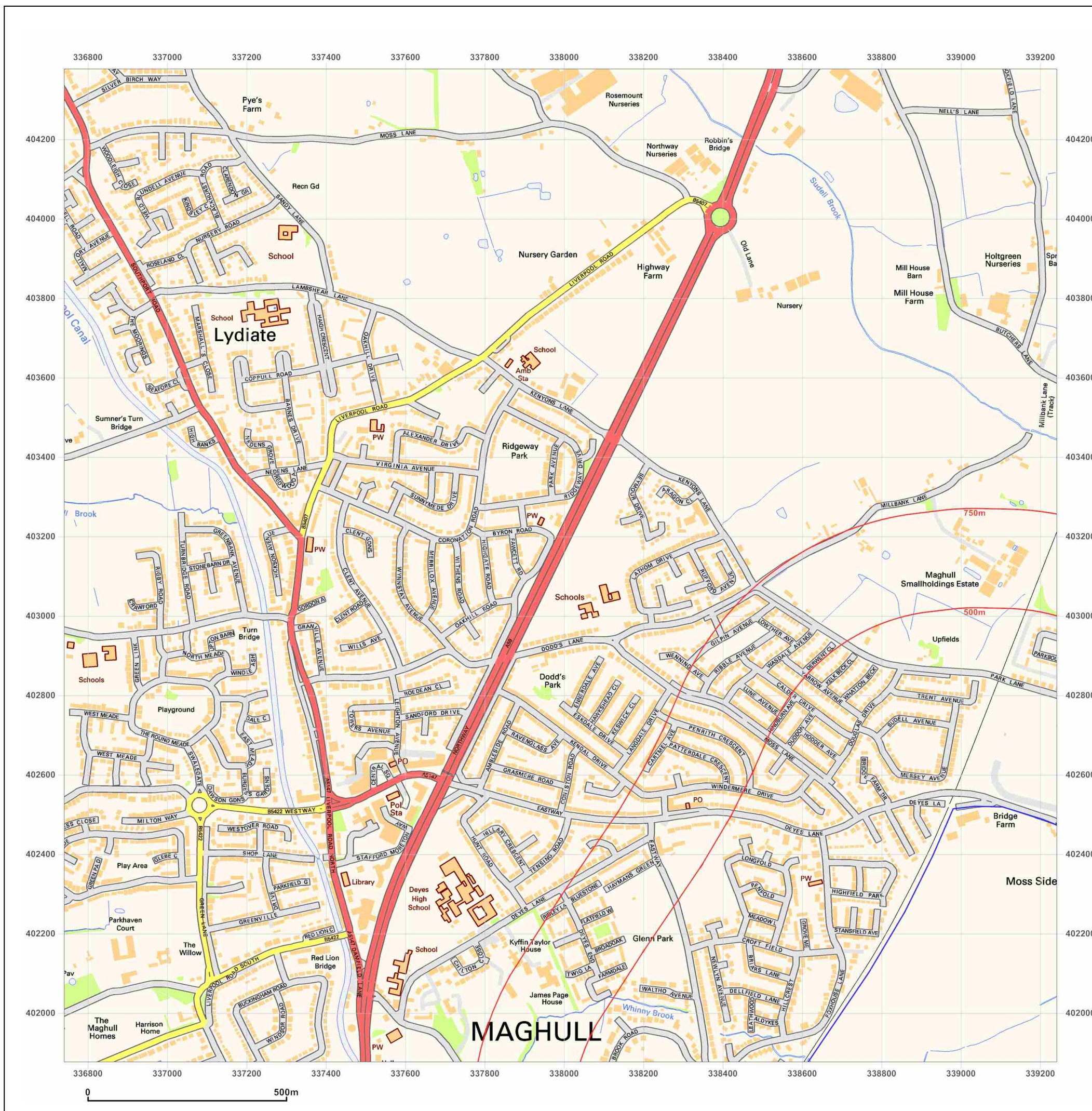


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Site Details:

ASHWORTH FARM, 1, SCHOOL
LANE, LIVERPOOL, L31 1BE

Client Ref: 3013996
Report Ref: GS-3683405_SS_2_1
Grid Ref: 340401, 400717

Map Name: County Series

Map date: 1907

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1846
Revised 1907
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1845
Revised 1907
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1847
Revised 1907
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1847
Revised 1907
Edition N/A
Copyright N/A
Levelled N/A

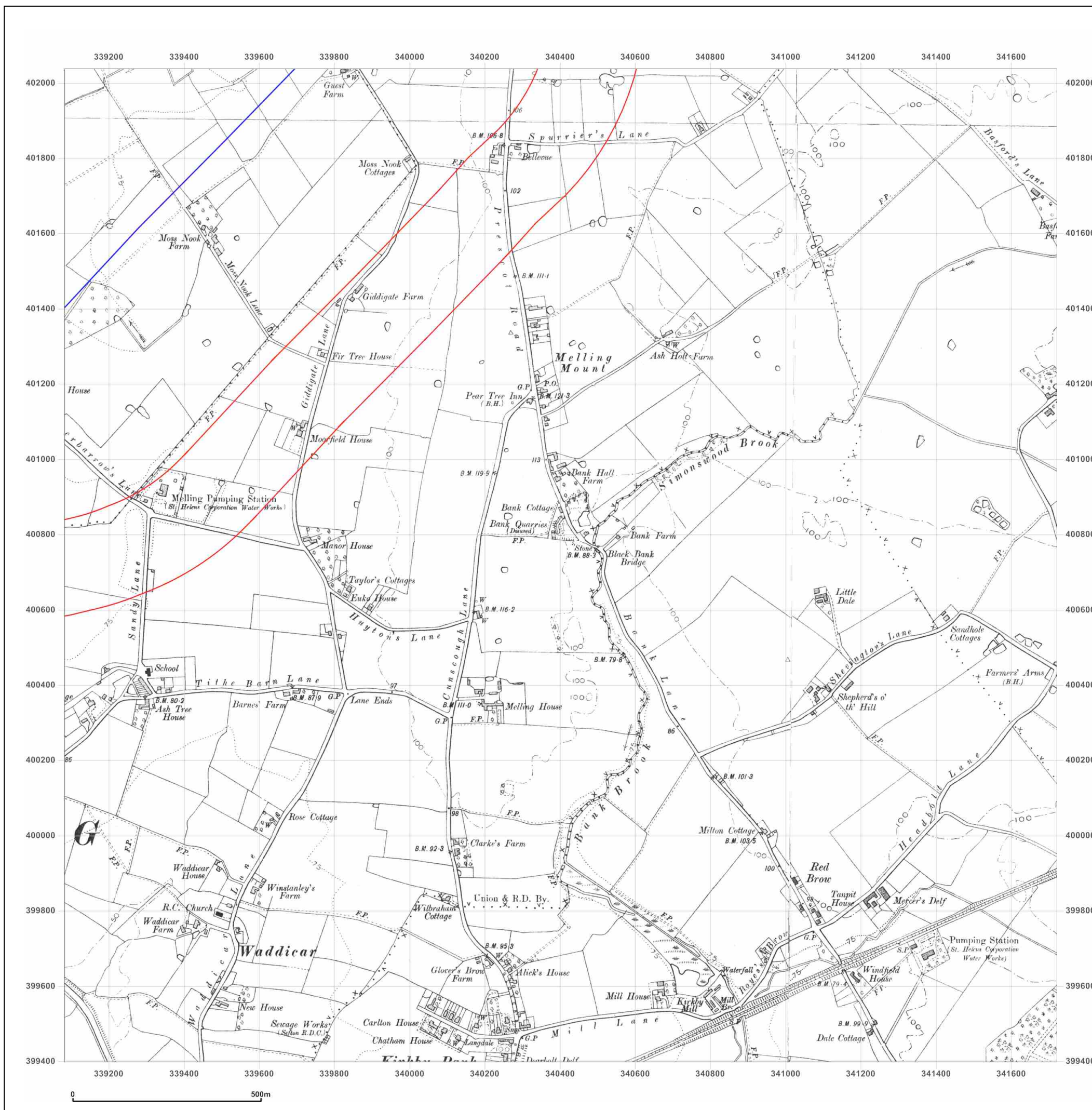


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Site Details:

ASHWORTH FARM, 1, SCHOOL
LANE, LIVERPOOL, L31 1BE

Client Ref: 3013996
Report Ref: GS-3683405_SS_2_1
Grid Ref: 340401, 400717

Map Name: County Series

Map date: 1925-1928

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1845
Revised 1926
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1847
Revised 1928
Edition 1928
Copyright N/A
Levelled N/A

Surveyed 1847
Revised 1925
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1847
Revised 1928
Edition N/A
Copyright N/A
Levelled N/A

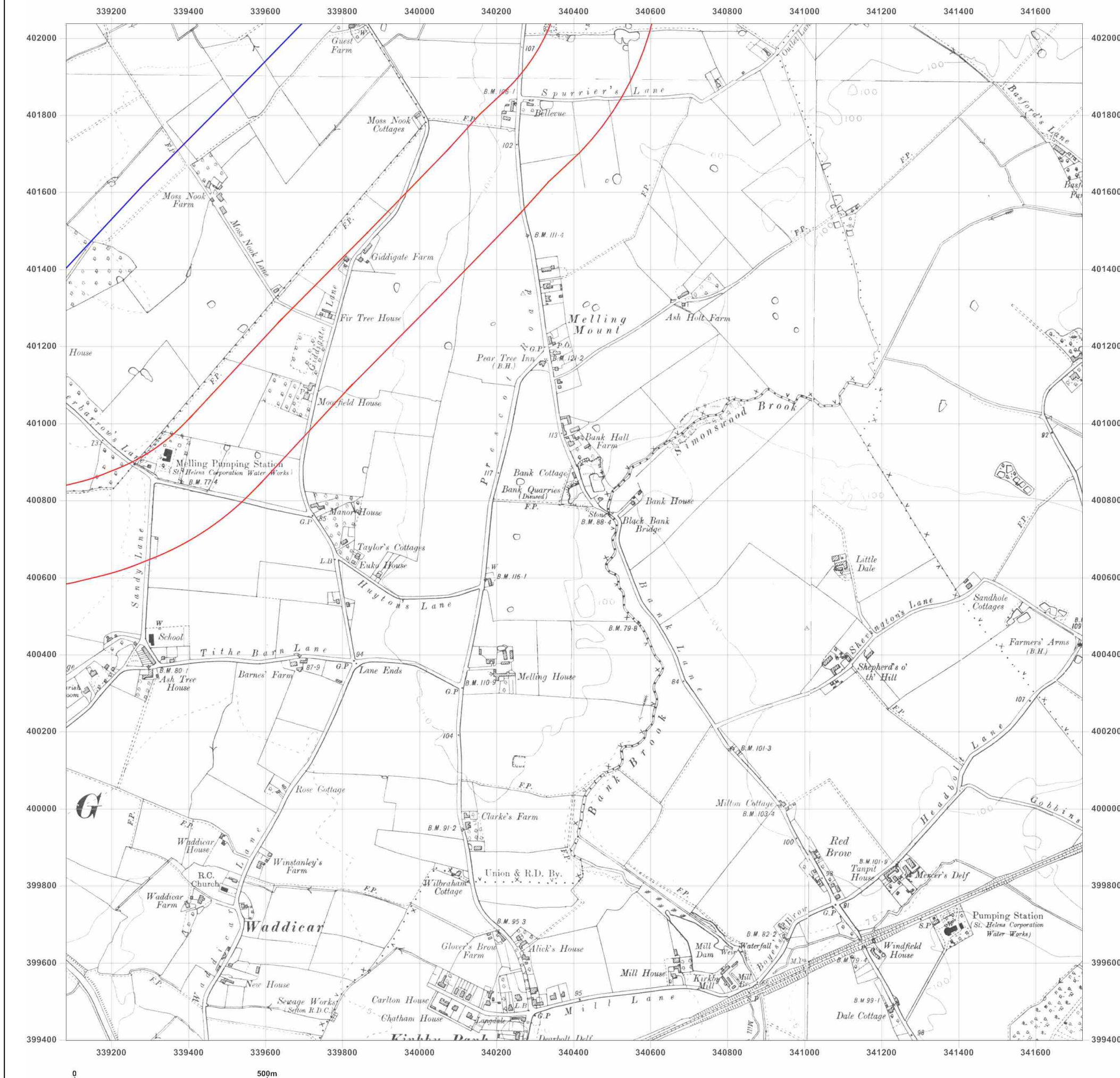


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Site Details:

ASHWORTH FARM, 1, SCHOOL
LANE, LIVERPOOL, L31 1BE

Client Ref: 3013996
Report Ref: GS-3683405_SS_2_1
Grid Ref: 340401, 400717

Map Name: County Series

Map date: 1938

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1845
Revised 1938
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1847
Revised 1938
Edition N/A
Copyright N/A
Levelled N/A

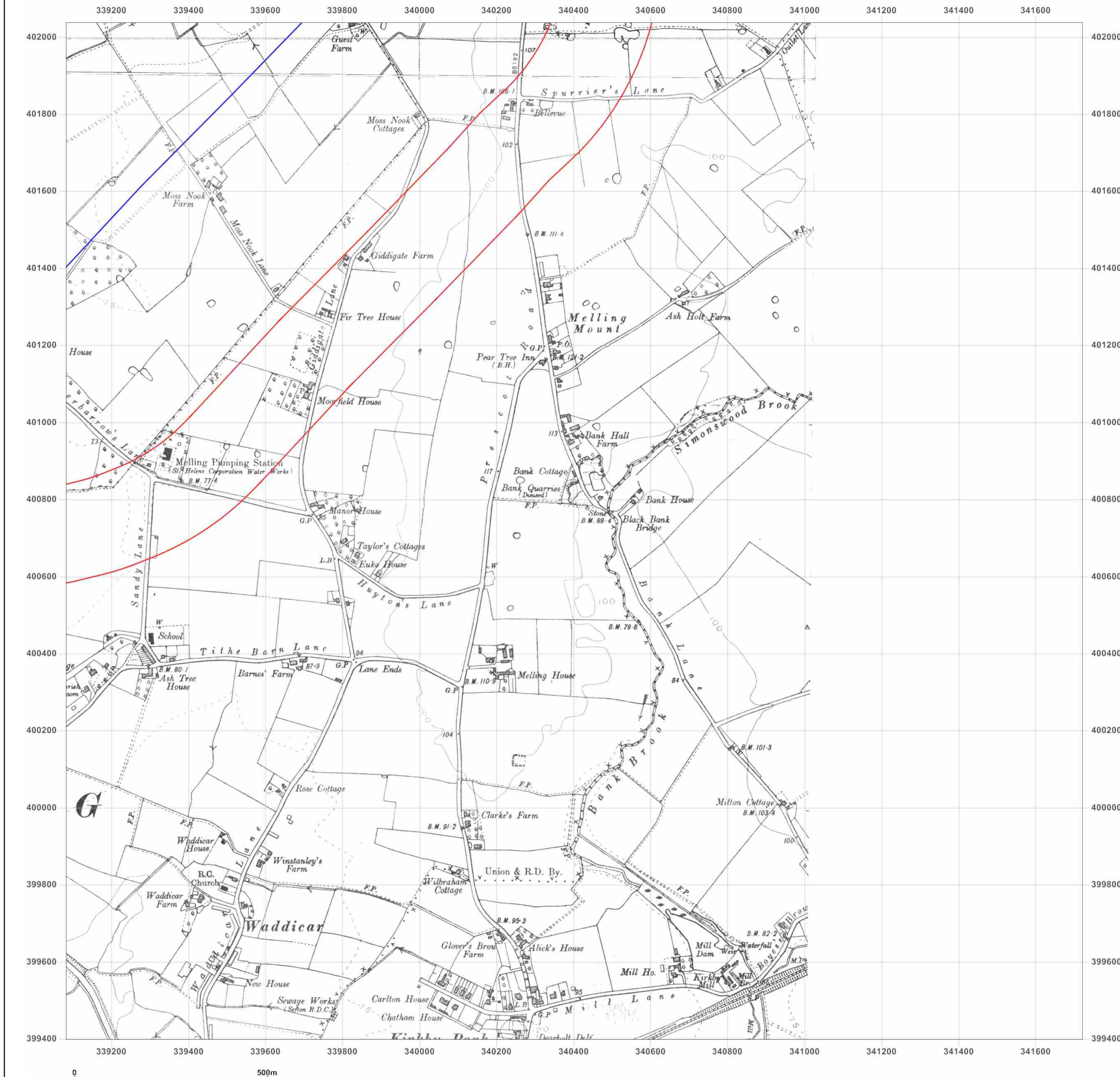


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Site Details:

ASHWORTH FARM, 1, SCHOOL
LANE, LIVERPOOL, L31 1BE

Client Ref: 3013996
Report Ref: GS-3683405_SS_2_1
Grid Ref: 340401, 400717

Map Name: Provisional

Map date: 1955-1956

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1949
Revised 1955
Edition N/A
Copyright N/A
Levelled N/A

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

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

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

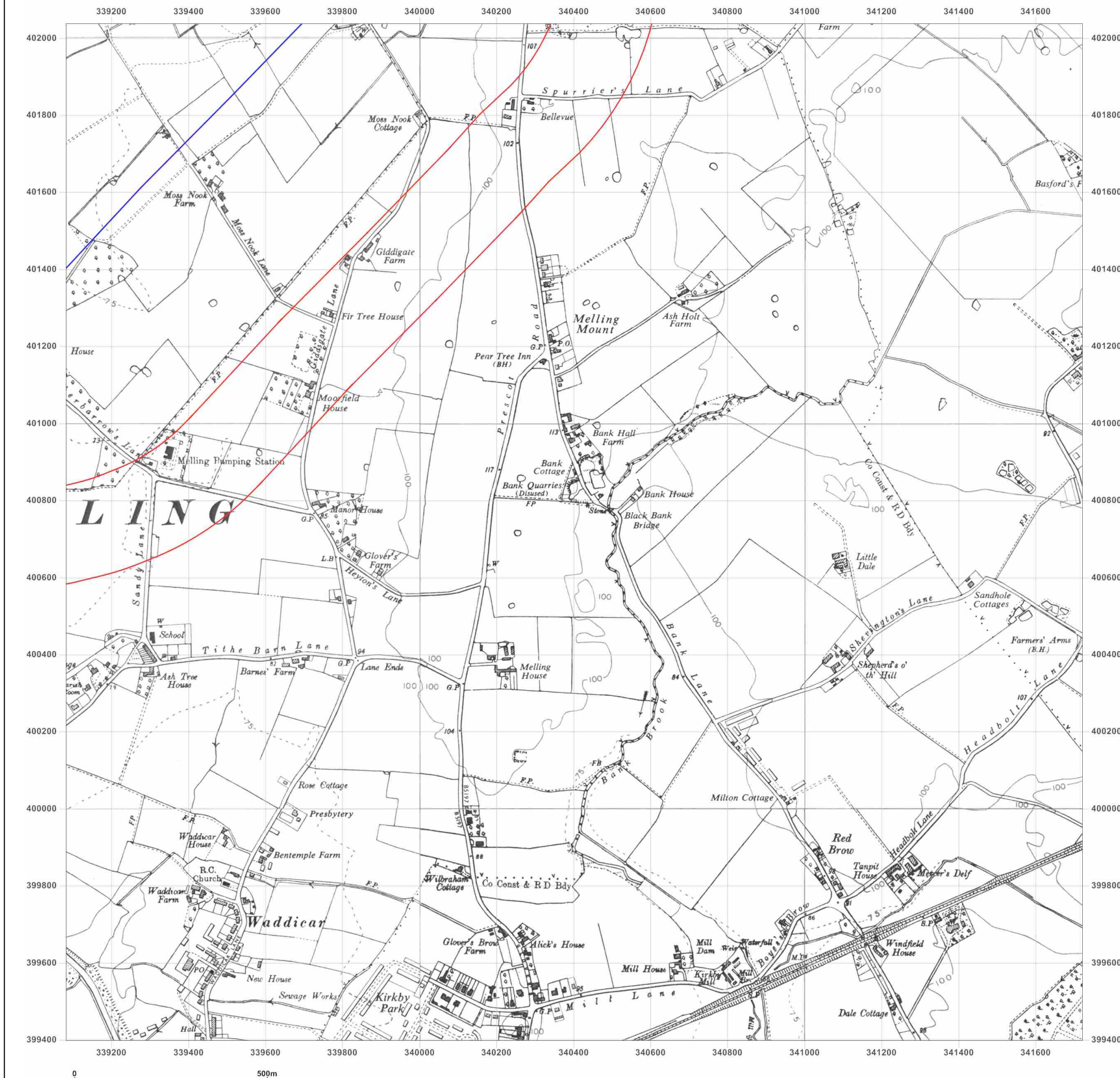


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Site Details:

ASHWORTH FARM, 1, SCHOOL
LANE, LIVERPOOL, L31 1BE

Client Ref: 3013996
Report Ref: GS-3683405_SS_2_1
Grid Ref: 340401, 400717

Map Name: Provisional

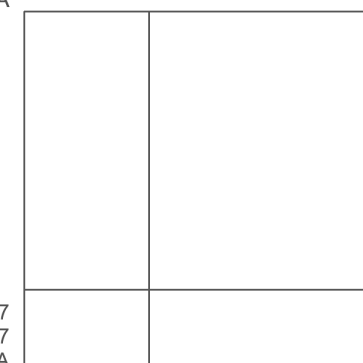
Map date: 1966-1968

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1949
Revised 1968
Edition N/A
Copyright N/A
Levelled N/A



Surveyed 1967
Revised 1967
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1966
Revised 1966
Edition N/A
Copyright N/A
Levelled N/A



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Site Details:

ASHWORTH FARM, 1, SCHOOL
LANE, LIVERPOOL, L31 1BE

Client Ref: 3013996
Report Ref: GS-3683405_SS_2_1
Grid Ref: 340401, 400717

Map Name: National Grid

Map date: 1974-1978

Scale: 1:10,000

Printed at: 1:10,000



Surveyed 1973
Revised 1974
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1972
Revised 1974
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1973
Revised 1973
Edition N/A
Copyright 1974
Levelled 1964

Surveyed 1975
Revised 1977
Edition N/A
Copyright 1978
Levelled 1964

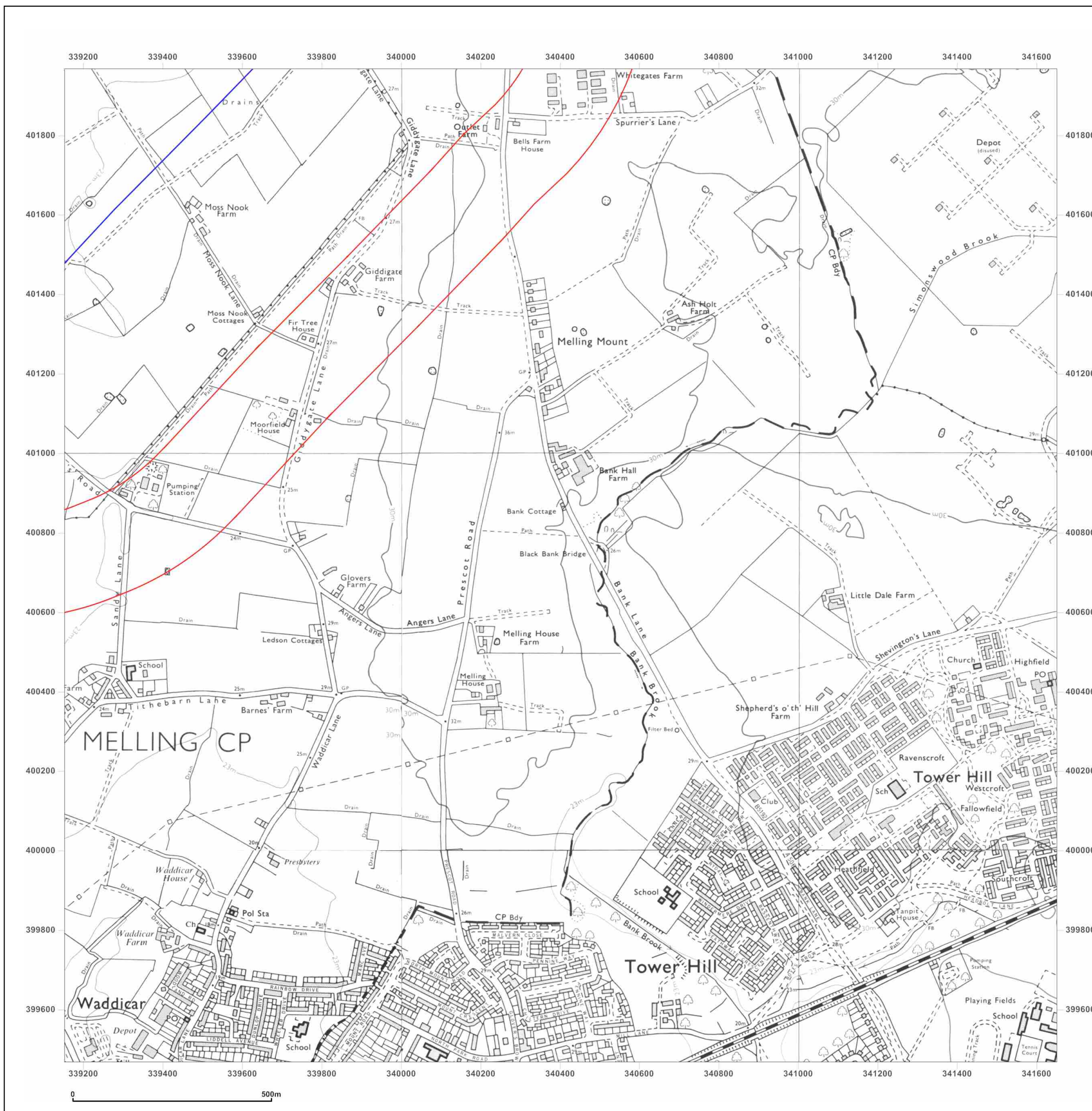


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Site Details:

ASHWORTH FARM, 1, SCHOOL
LANE, LIVERPOOL, L31 1BE

Client Ref: 3013996
Report Ref: GS-3683405_SS_2_1
Grid Ref: 340401, 400717

Map Name: National Grid

Map date: 1985-1988

Scale: 1:10,000

Printed at: 1:10,000



Surveyed 1984
Revised 1985
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1985
Revised 1987
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1983
Revised 1987
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1987
Revised 1988
Edition N/A
Copyright N/A
Levelled N/A

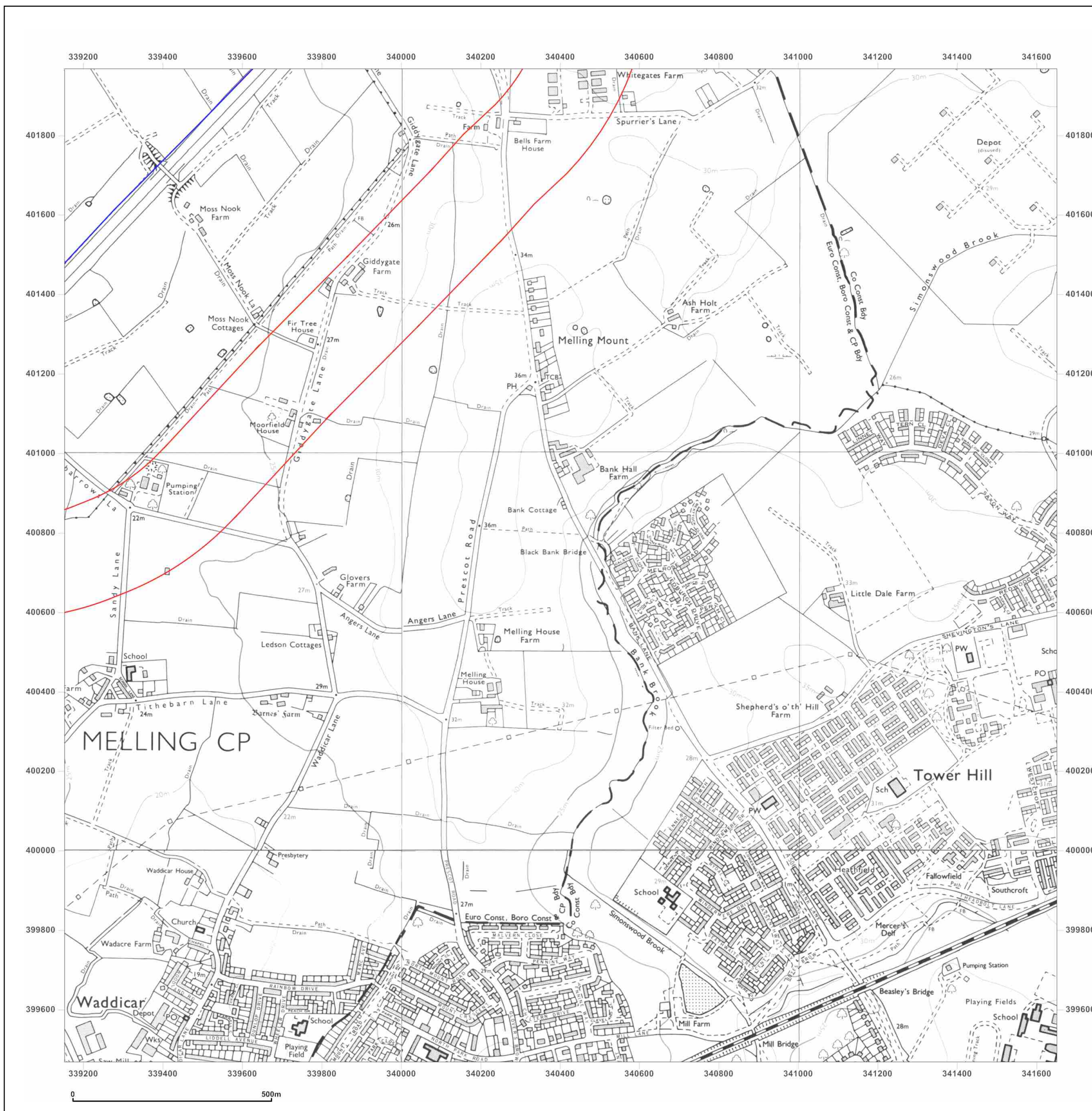


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Site Details:

ASHWORTH FARM, 1, SCHOOL
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Client Ref: 3013996
Report Ref: GS-3683405_SS_2_1
Grid Ref: 340401, 400717

Map Name: 1:10,000 Raster

Map date: 2002

Scale: 1:10,000

Printed at: 1:10,000



2002

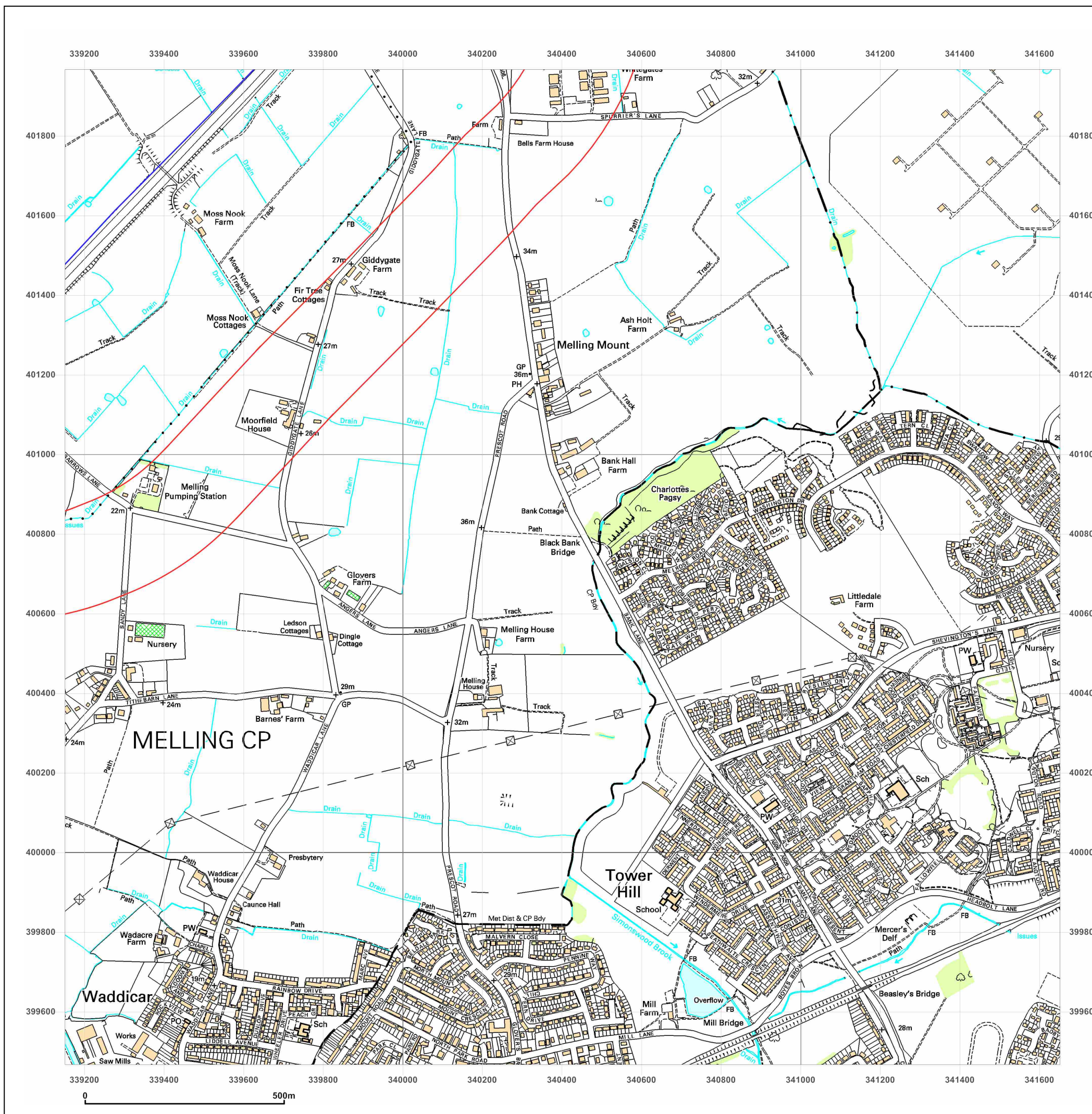


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LANE, LIVERPOOL, L31 1BE

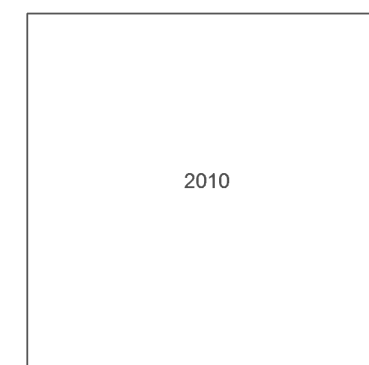
Client Ref: 3013996
Report Ref: GS-3683405_SS_2_1
Grid Ref: 340401, 400717

Map Name: National Grid

Map date: 2010

Scale: 1:10,000

Printed at: 1:10,000

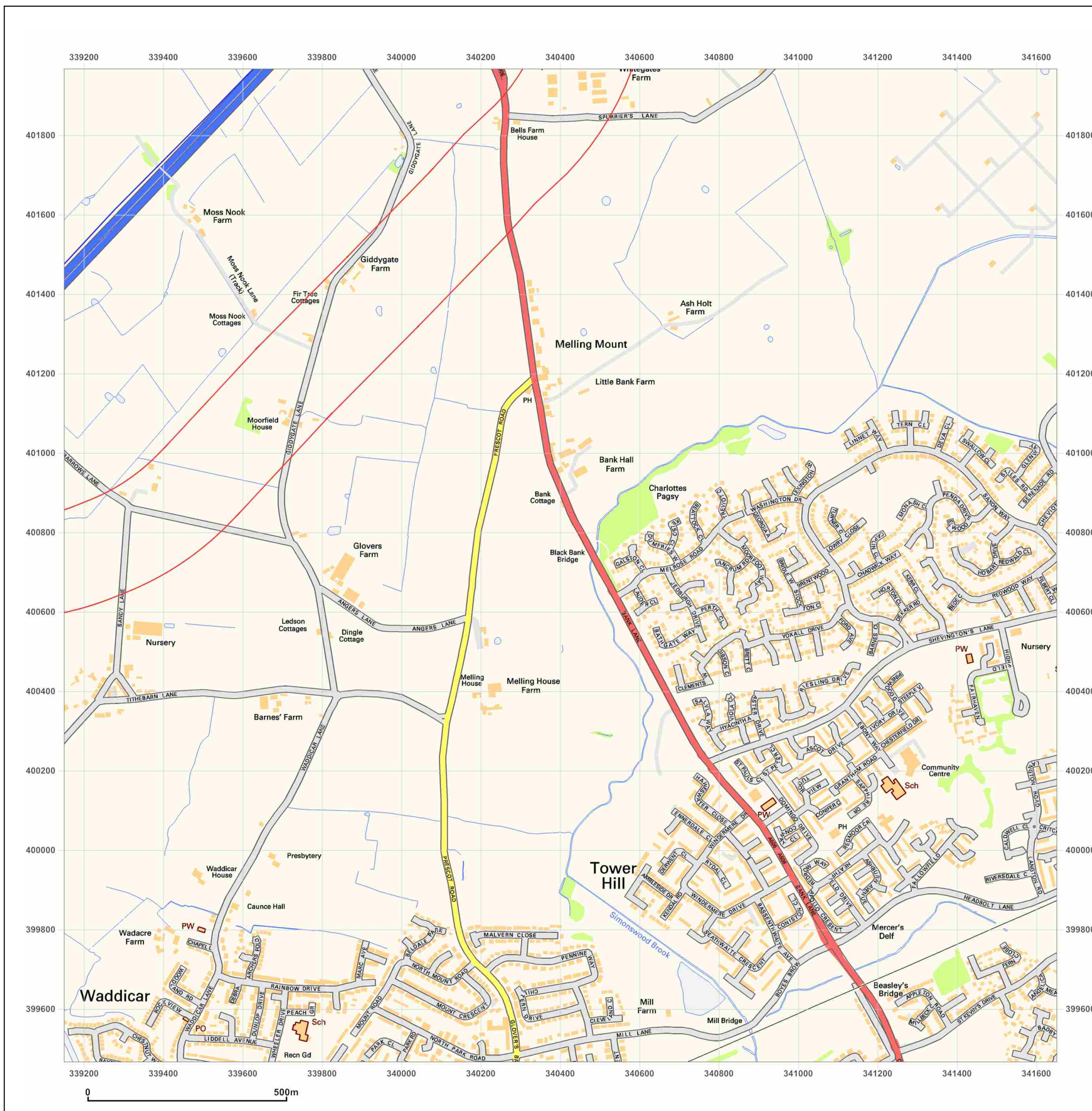


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Production date: 24 February 2017

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Site Details:

ASHWORTH FARM, 1, SCHOOL
LANE, LIVERPOOL, L31 1BE

Client Ref: 3013996
Report Ref: GS-3683405_SS_2_1
Grid Ref: 340401, 400717

Map Name: National Grid

Map date: 2014

Scale: 1:10,000

Printed at: 1:10,000



2014

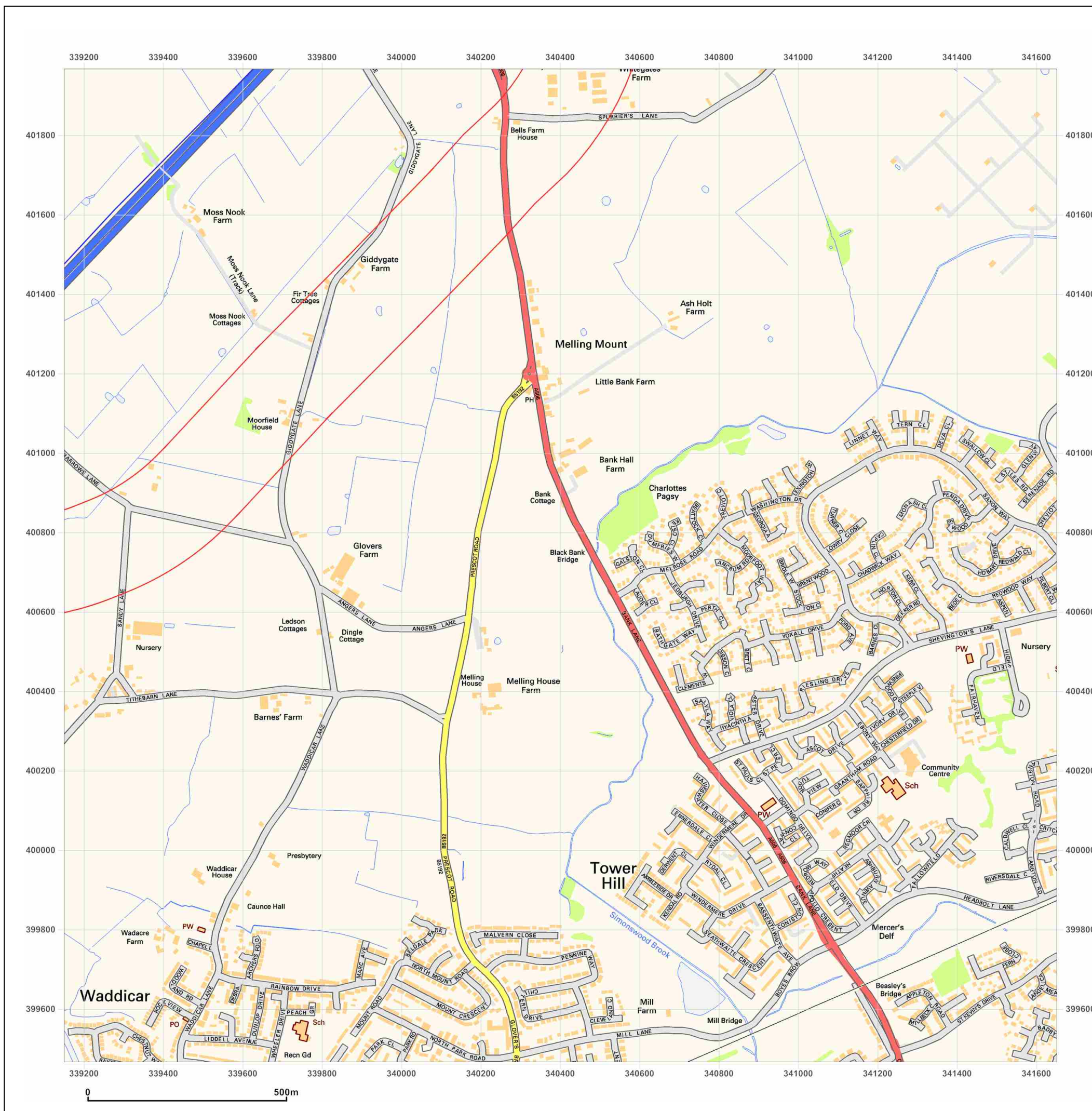


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Production date: 24 February 2017

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Site Details:

ASHWORTH FARM, 1, SCHOOL
LANE, LIVERPOOL, L31 1BE

Client Ref: 3013996
Report Ref: GS-3683405_SS_2_2
Grid Ref: 340401, 403127

Map Name: County Series

Map date: 1849-1850

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1846
Revised N/A
Edition 1849
Copyright N/A
Levelled N/A

Surveyed 1846
Revised N/A
Edition 1849
Copyright N/A
Levelled N/A

Surveyed 1848
Revised N/A
Edition 1850
Copyright N/A
Levelled N/A

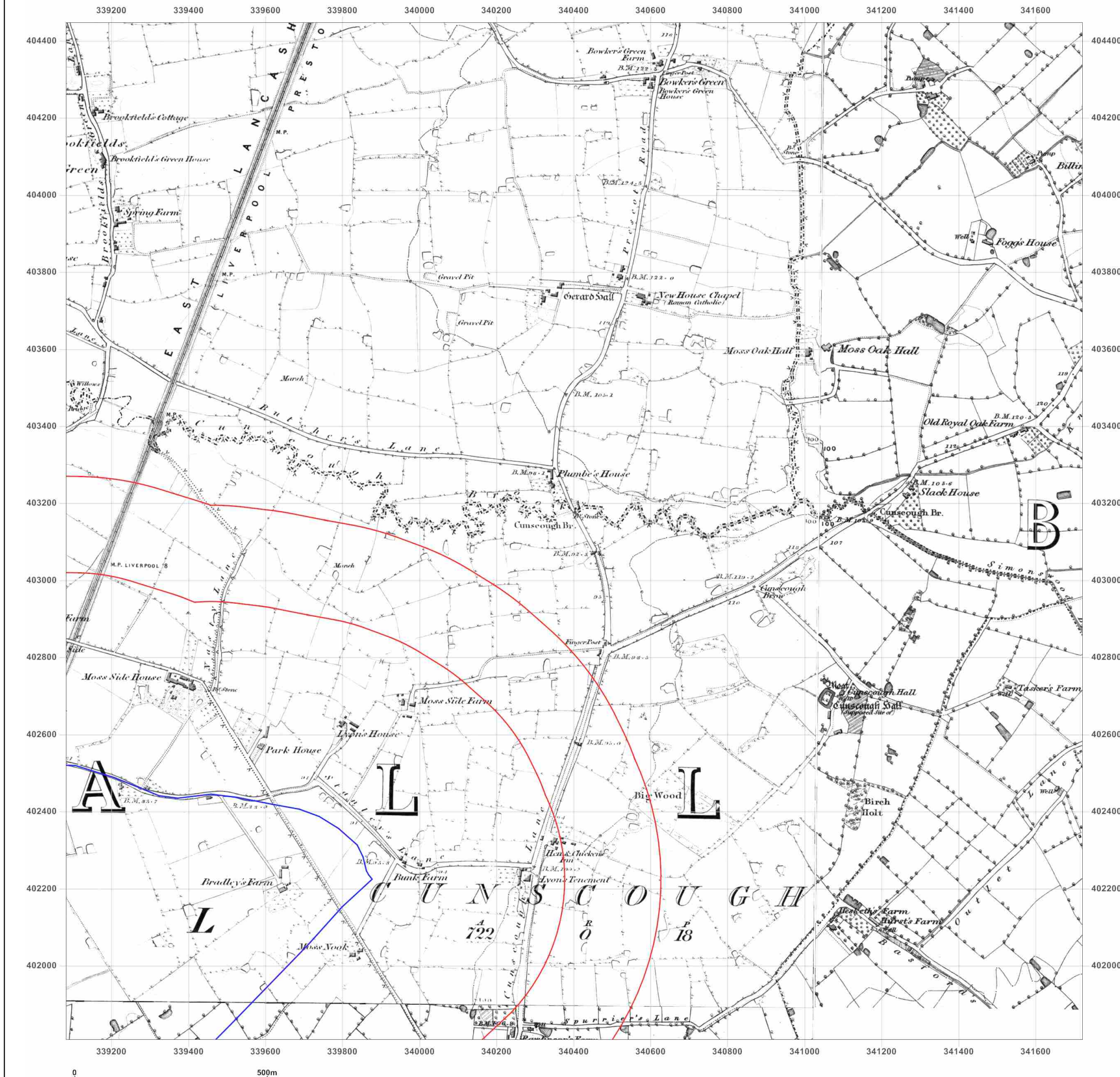


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Production date: 24 February 2017

To view map legend click here [Legend](#)



Site Details:

ASHWORTH FARM, 1, SCHOOL
LANE, LIVERPOOL, L31 1BE

Client Ref: 3013996
Report Ref: GS-3683405_SS_2_2
Grid Ref: 340401, 403127

Map Name: County Series

Map date: 1892

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1892
Revised 1892
Edition N/A
Copyright N/A
Levelled N/A

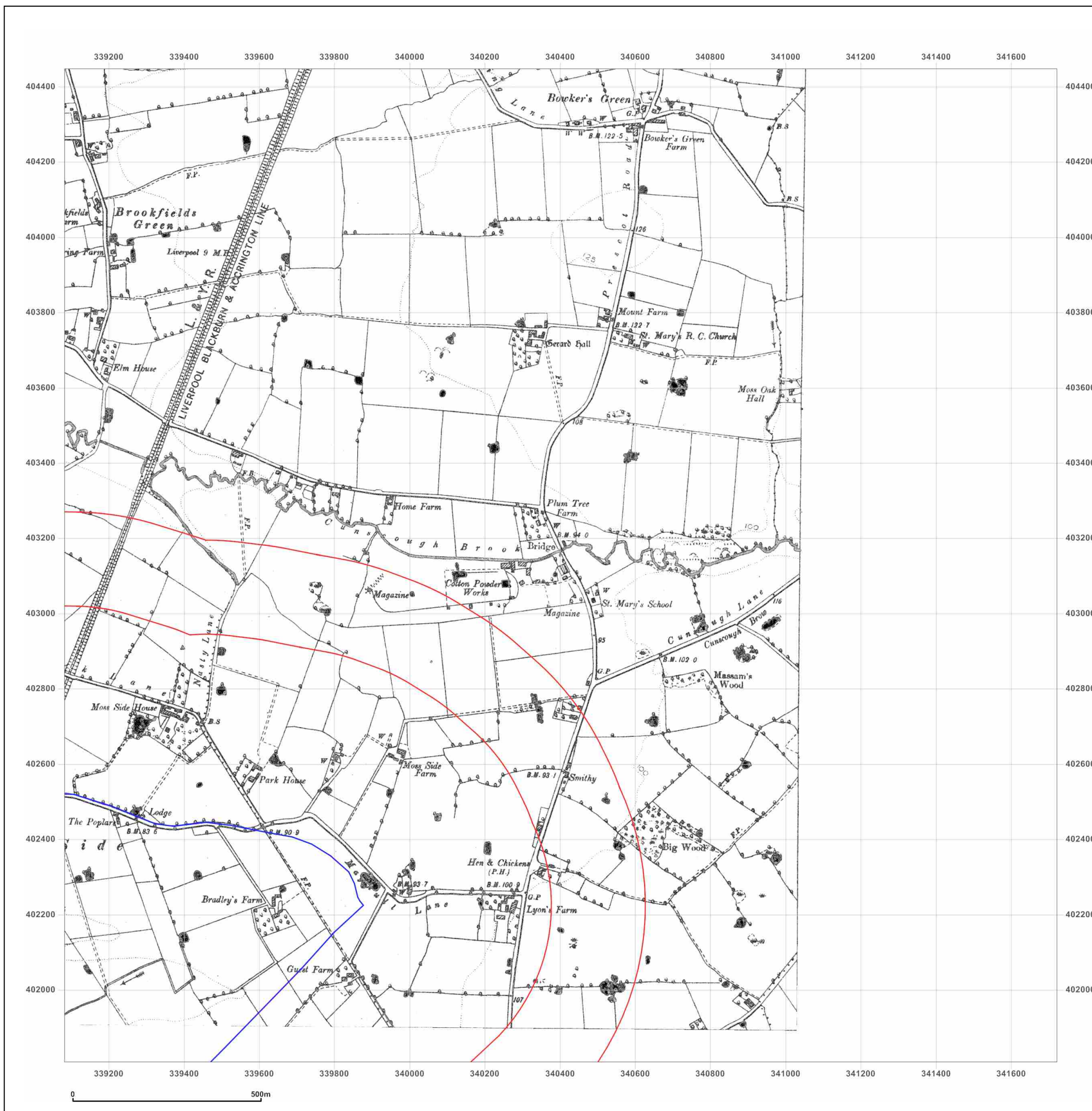


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Production date: 24 February 2017

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Site Details:

ASHWORTH FARM, 1, SCHOOL
LANE, LIVERPOOL, L31 1BE

Client Ref: 3013996
Report Ref: GS-3683405_SS_2_2
Grid Ref: 340401, 403127

Map Name: County Series

Map date: 1925-1928

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1845
Revised 1926
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1847
Revised 1928
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1847
Revised 1925
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1847
Revised 1928
Edition N/A
Copyright N/A
Levelled N/A

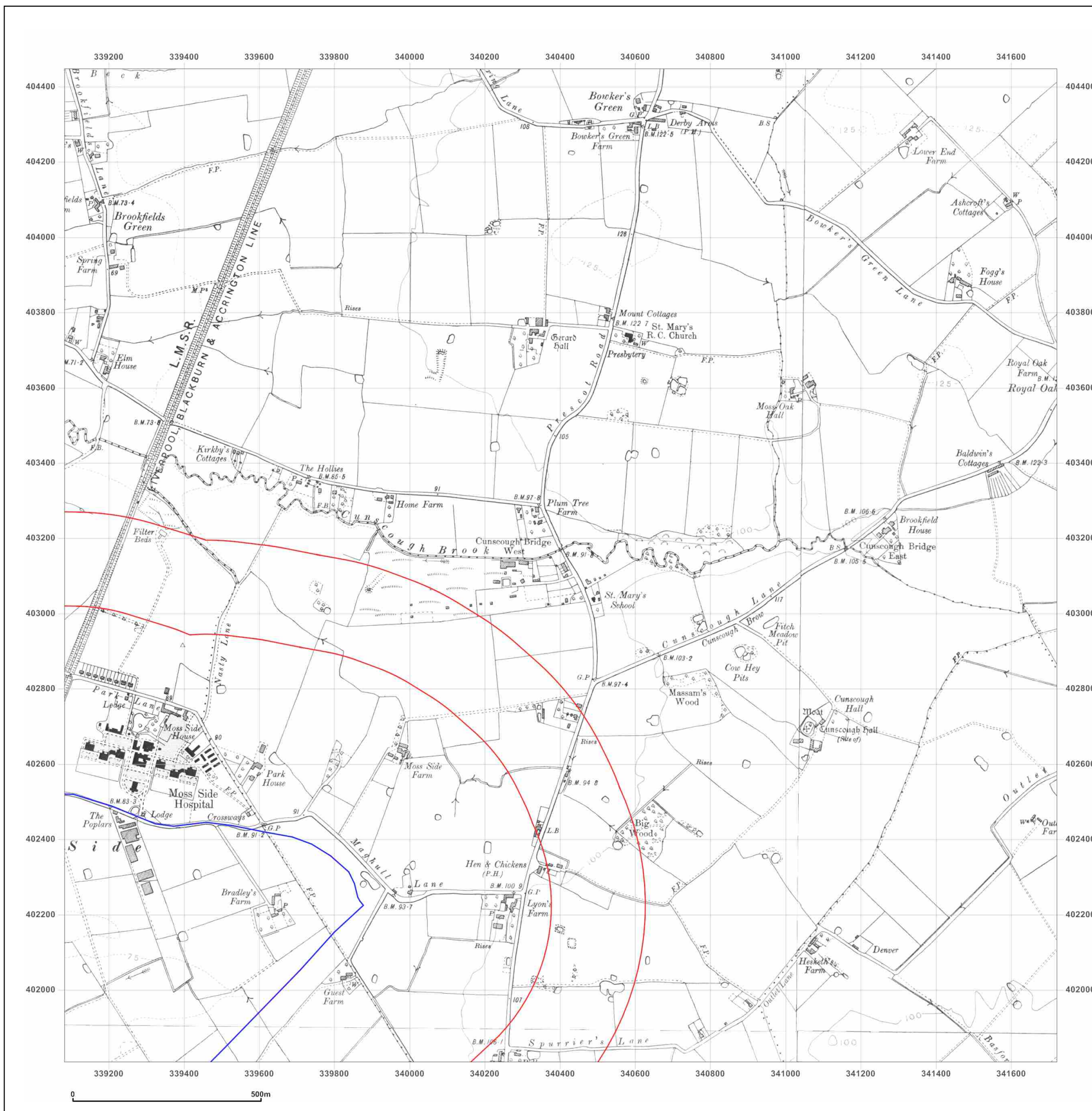


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Production date: 24 February 2017

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Site Details:

ASHWORTH FARM, 1, SCHOOL
LANE, LIVERPOOL, L31 1BE

Client Ref: 3013996
Report Ref: GS-3683405_SS_2_2
Grid Ref: 340401, 403127

Map Name: County Series

Map date: 1938

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1845
Revised 1938
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1847
Revised 1938
Edition N/A
Copyright N/A
Levelled N/A

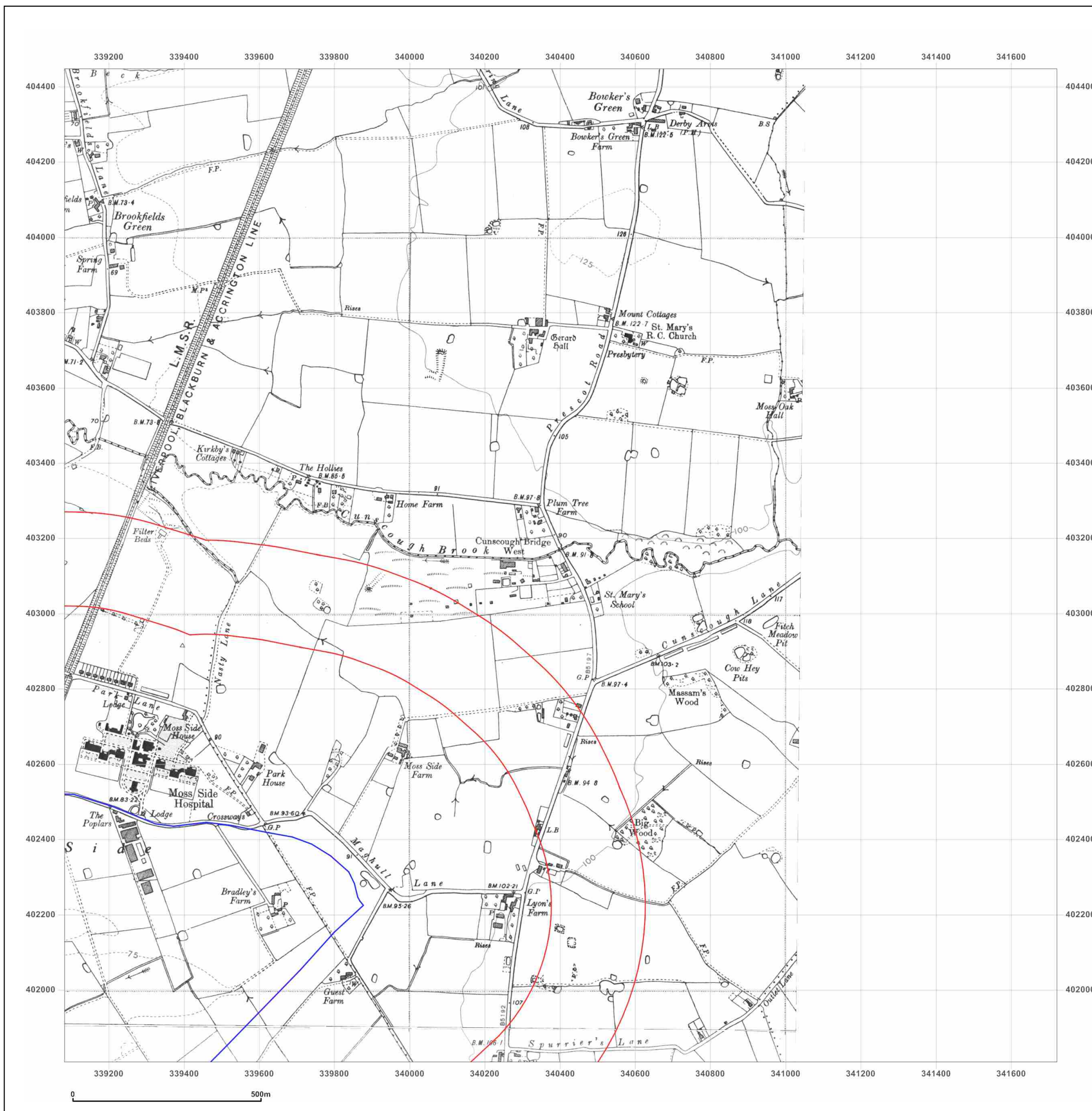


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Site Details:

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LANE, LIVERPOOL, L31 1BE

Client Ref: 3013996
Report Ref: GS-3683405_SS_2_2
Grid Ref: 340401, 403127

Map Name: Provisional

Map date: 1955

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1949
Revised 1955
Edition N/A
Copyright N/A
Levelled N/A

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

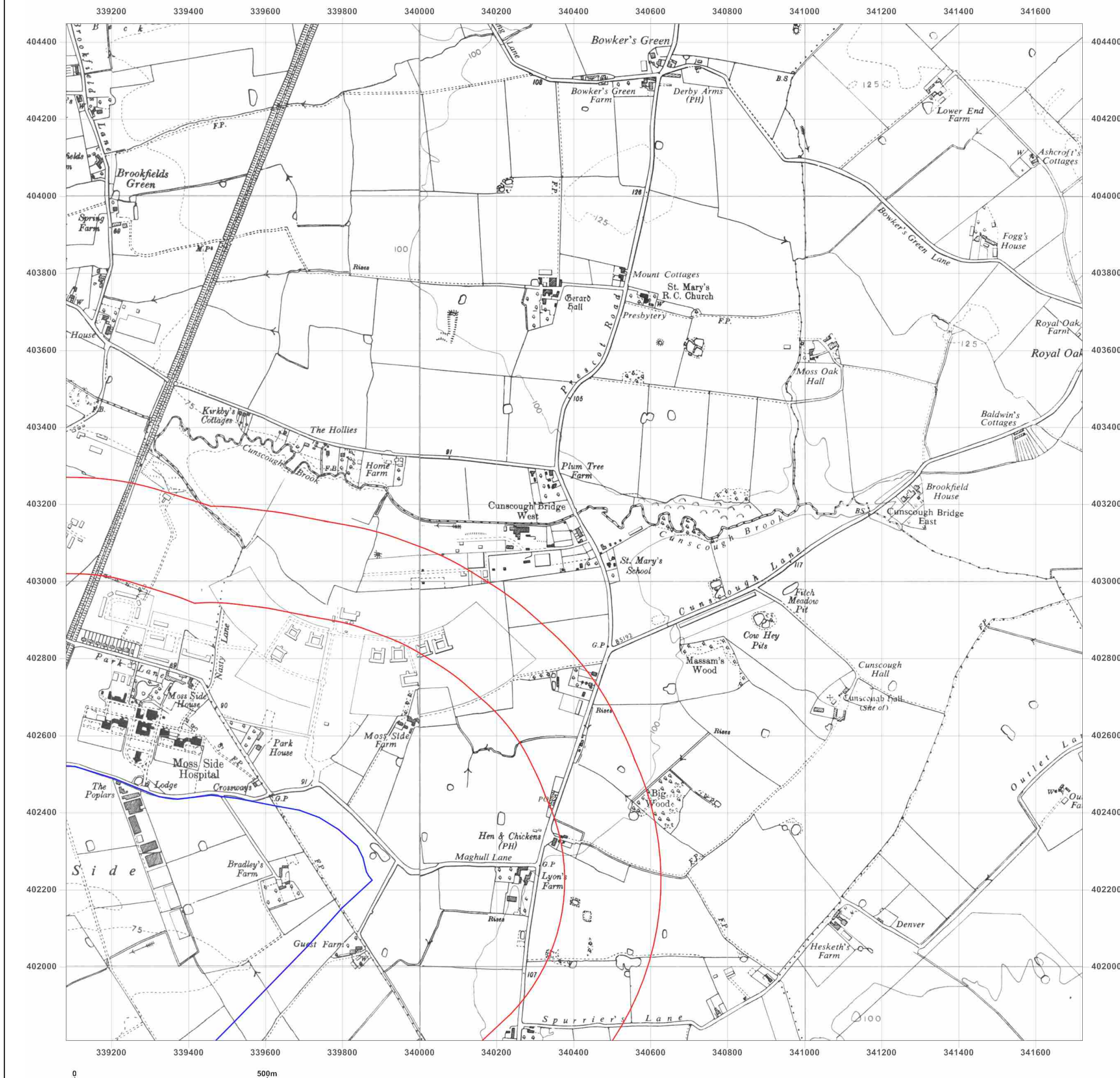


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Production date: 24 February 2017

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Site Details:

ASHWORTH FARM, 1, SCHOOL
LANE, LIVERPOOL, L31 1BE

Client Ref: 3013996
Report Ref: GS-3683405_SS_2_2
Grid Ref: 340401, 403127

Map Name: Provisional

Map date: 1968

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1949
Revised 1968
Edition N/A
Copyright N/A
Levelled N/A

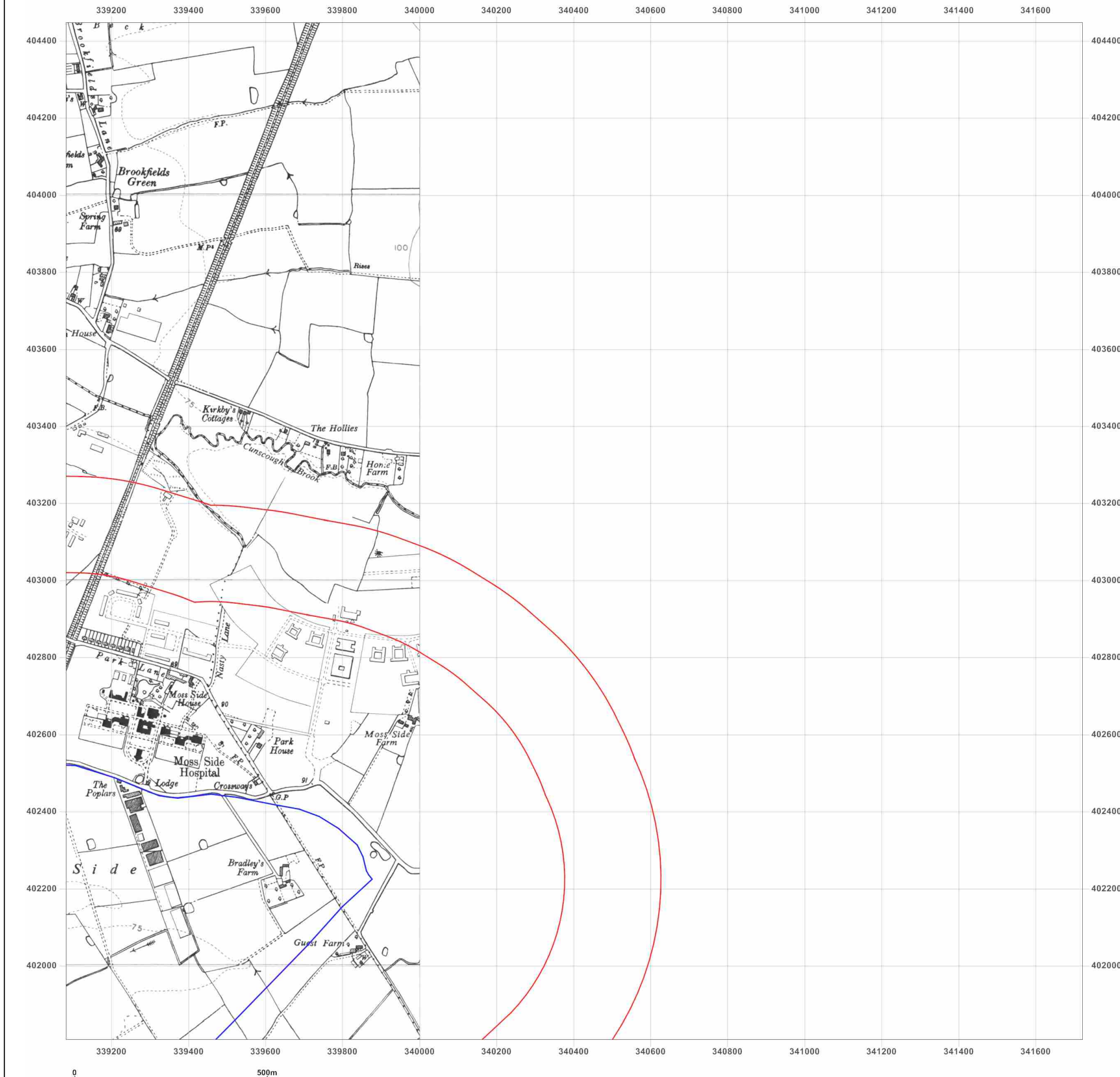


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Site Details:

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Client Ref: 3013996
Report Ref: GS-3683405_SS_2_2
Grid Ref: 340401, 403127

Map Name: National Grid

Map date: 1974

Scale: 1:10,000

Printed at: 1:10,000



Surveyed 1973
Revised 1974
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1972
Revised 1974
Edition N/A
Copyright N/A
Levelled N/A

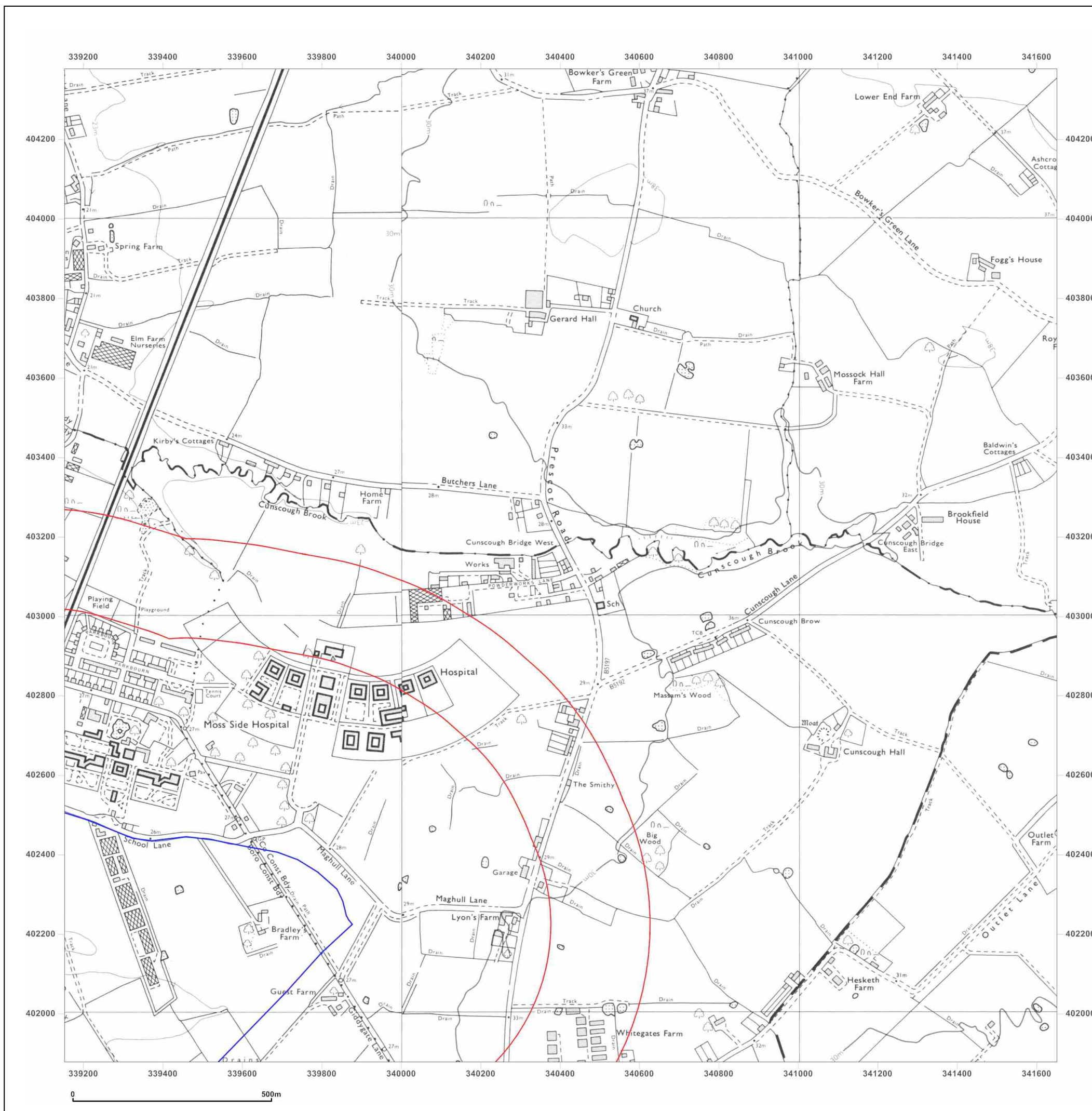


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Site Details:

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LANE, LIVERPOOL, L31 1BE

Client Ref: 3013996
Report Ref: GS-3683405_SS_2_2
Grid Ref: 340401, 403127

Map Name: National Grid

Map date: 1985-1987

Scale: 1:10,000

Printed at: 1:10,000



Surveyed 1984
Revised 1985
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1985
Revised 1987
Edition N/A
Copyright N/A
Levelled N/A

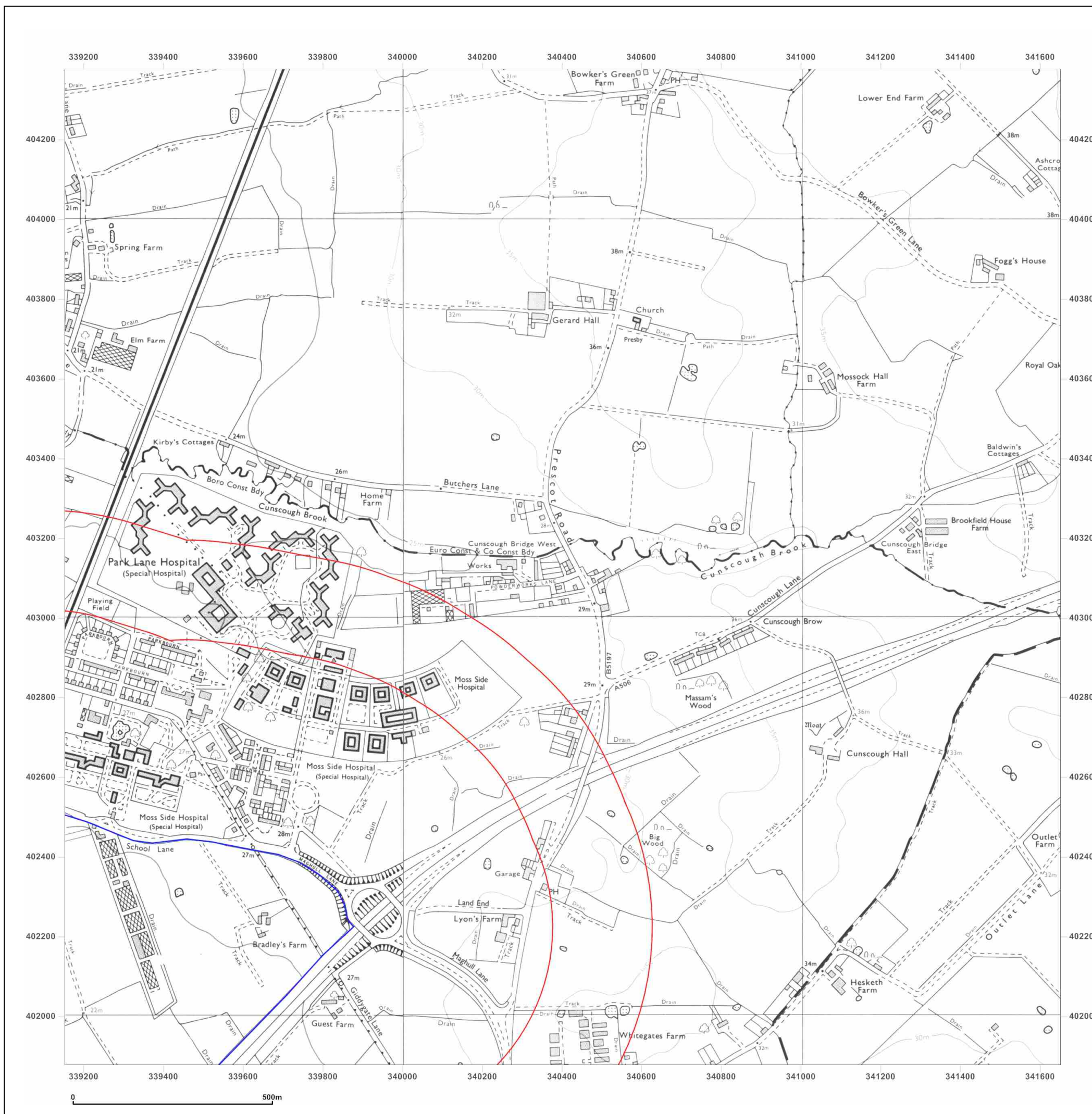


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Production date: 24 February 2017

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Site Details:

ASHWORTH FARM, 1, SCHOOL
LANE, LIVERPOOL, L31 1BE

Client Ref: 3013996
Report Ref: GS-3683405_SS_2_2
Grid Ref: 340401, 403127

Map Name: 1:10,000 Raster

Map date: 2002

Scale: 1:10,000

Printed at: 1:10,000



2002

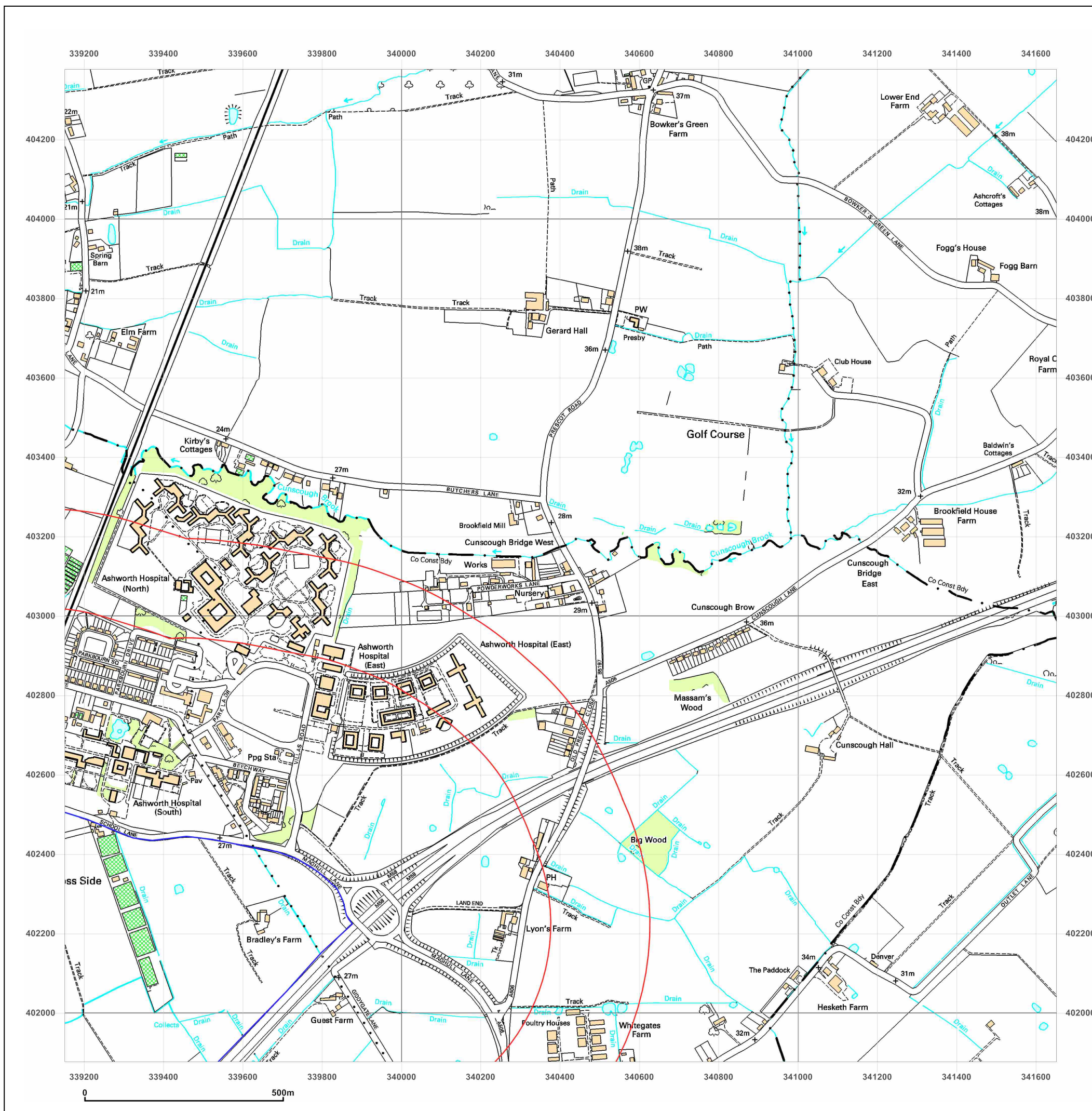


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Site Details:

ASHWORTH FARM, 1, SCHOOL
LANE, LIVERPOOL, L31 1BE

Client Ref: 3013996
Report Ref: GS-3683405_SS_2_2
Grid Ref: 340401, 403127

Map Name: National Grid

Map date: 2010

Scale: 1:10,000

Printed at: 1:10,000



2010

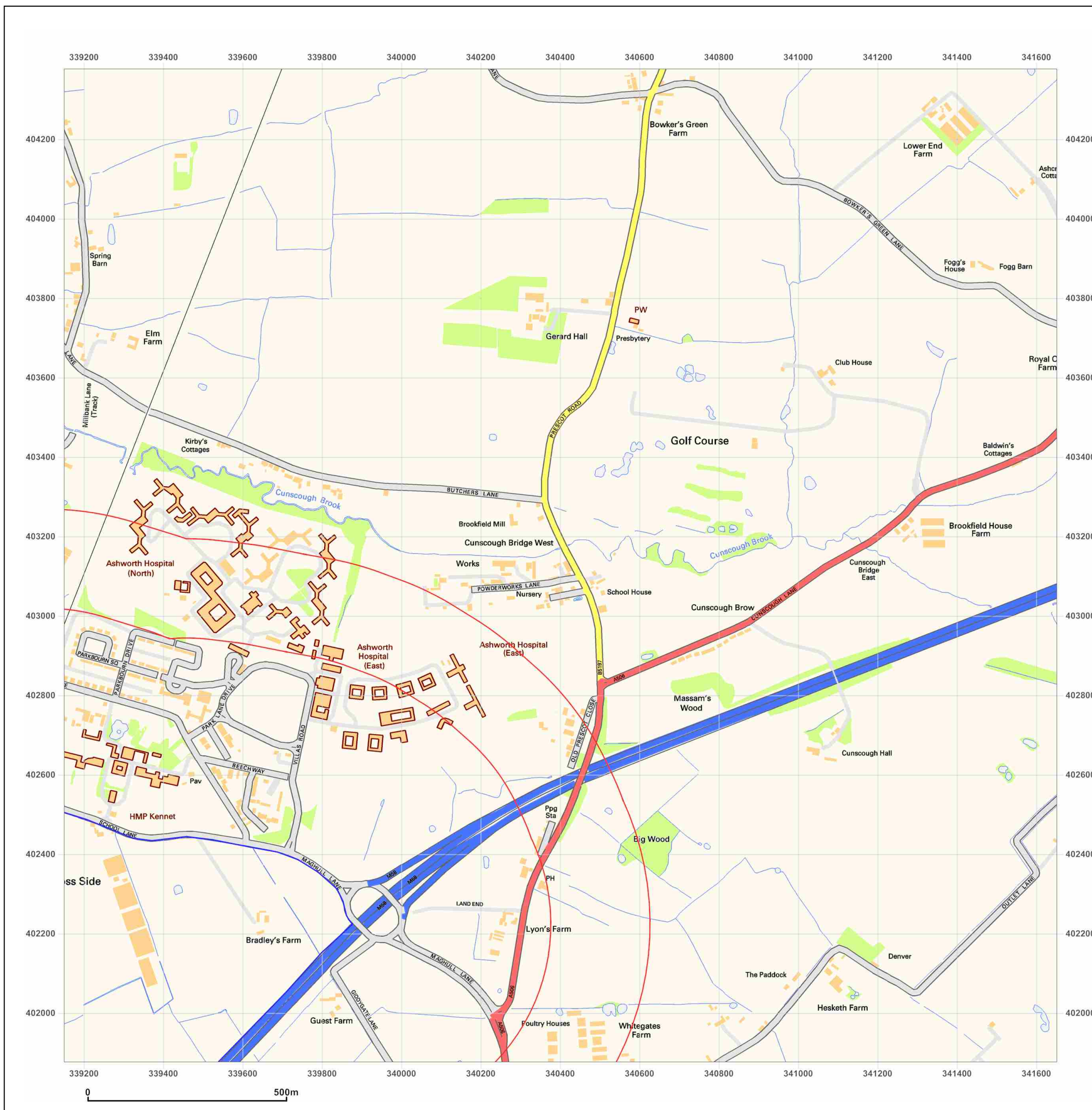


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Production date: 24 February 2017

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Site Details:

ASHWORTH FARM, 1, SCHOOL
LANE, LIVERPOOL, L31 1BE

Client Ref: 3013996
Report Ref: GS-3683405_SS_2_2
Grid Ref: 340401, 403127

Map Name: National Grid

Map date: 2014

Scale: 1:10,000

Printed at: 1:10,000



2014

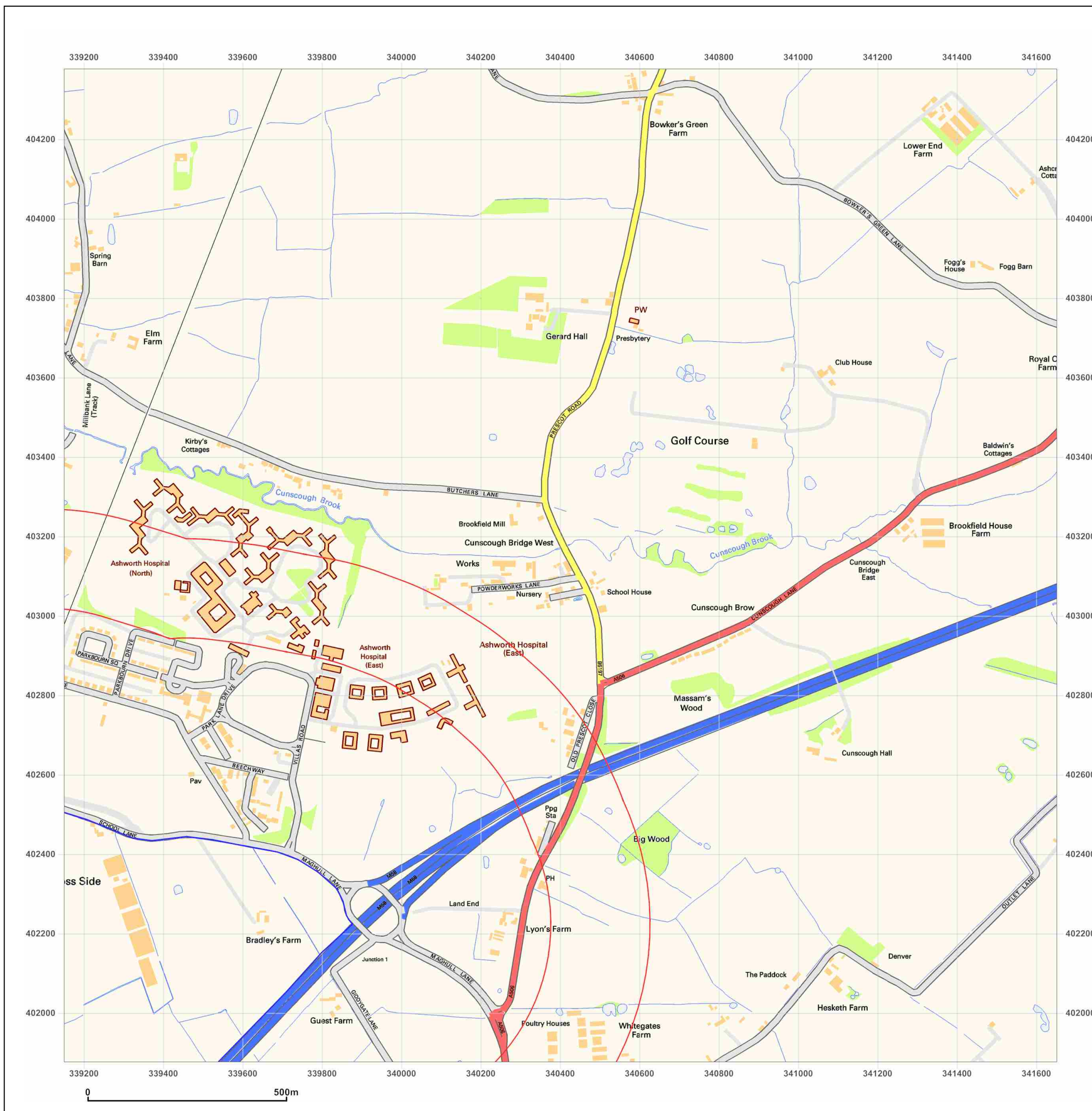


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- 1:1250 and 1:2500 Historical Maps provided in separate PDF files -

APPENDIX D

BGS Online Scanned Borehole Logs

Test WELL BORING at *Whining Brook* NGR *C.3920 0198* 28
 County *Lancs.* 84/24
 Geol. map 1 in. map New Series 84 6 in. map 915E
 Made by *British Geological Survey* Date *84*
 Sunk *8* feet. Bored *8* feet.
 Communicated by
 Height above Ordnance Datum *71.50ft abn.o.D.* Rest level of water *No water stated*
 Yield
 Quality (with copy of analysis on separate sheet)

LITHOLOGICAL FORMATION.	NATURE OF STRATA.	THICKNESS.		DEPTH.					
		Feet.	Inches.	Feet.	Inches.				
	Soil	1	6	1	6	0	46	0	46
	Dry sand	1	6	3	-	0	45	0	91
	Clay	35	-	38	-	10	67	11	58
	Dry sand	3	-	41	-	0	92	12	50
	Rock (coloured red)	19	-	60	-	5	79	18	29
Copied from tracing at Southampton Water Board office supplied to Water Bd. by H. Rife & Sons, Engineers 8 Victoria St., S.W.1.									

Test

BORING at *Whinny Brook*County *Lancs*

9/24

Geol. map

1 in. map New Series *84*6 in. map *915E*

Made by

Date

~~Sunk~~

feet.

Bored

feet.

Communicated by

Height above Ordnance Datum *71.50ft abn o.D.* Rest level of water *No water stated*

Yield

British Geological Survey

British Geological Survey

Quality (with copy of analysis on separate sheet)

SD 30/23

GEOLOGICAL FORMATION.

NATURE OF STRATA.

THICKNESS.		DEPTH.	
Feet.	Inches.	Feet.	Inches.

Soil
Dry sand
Clay
Dry sand
Rock (coloured red)

1 6
1 6
35
3 -
19 -

1 6
3 -
38 -
41 -
60 -

*Copied from tracing at Southport Water Board office
 supplied to Water Bd. by H. Rofe & Sons, Engineers
 8 Victoria St, S.W.1.*

*37. (84/24). Maghull: South bank of Whinny Brook c. 600 yds.
 S. of Moss Side Hospital.
 Surface 71. Bore 60.*

Drift ...
Bunter ...

...
...

41
19

41
60

*TRIASSIC**(BUNTER Sst.)*

British Geological Survey

British Geological Survey

British Geological Survey

British Geological Survey

British Geological Survey

British Geological Survey

British Geological Survey

British Geological Survey

British Geological Survey

Sited with Δ on 6" Lancs 91SE/E

At WOODBURN FARM

Town or Village MASHHALL

County LANCAS

84 / 183

34/183

SD 30/63

EXACT SITE

British Geological Survey

British Geological Survey

British Geological Survey

Six-inch National Grid sheet and reference SD. 391... 024... SD 30 SE

OF WELL

For

State whether owner, tenant, builder, contractor, consultant, etc.:

Address (if different from above)

British Geological Survey

British Geological Survey

British Geological Survey

Level of ground surface above sea level (O.D.) 32 ft (..... m)

*DELETE

If well top is not at ground level state how far above* below: ft (..... m)

AS

SHAFT ft (..... m); diameter ft (..... m);

NECESSARY

HEADINGS (please attach details—dimensions and directions)

BORE 60 ft (..... m); diameter: at top in (..... mm);

British Geological Survey

British Geological Survey

British Geological Survey

at bottom in (..... mm)

Full details of permanent lining tubes (position, length, inner and outer diameters, plain slotted etc.):

British Geological Survey

British Geological Survey

British Geological Survey

Water struck at depths of ft (..... m) below well top

Rest level of water ft (..... m) above* below well top. Suction at ft (..... m)

TEST

Yield on hours* days' test pumping at galls per (..... l/s) with

CONDITIONS

depression to ft (..... m) below well top. Recovery to rest level in mins* hours

British Geological Survey

British Geological Survey

British Geological Survey

Capacity of pump g.p.h. (..... l/s)

Date of measurements

DESCRIPTION OF PERMANENT PUMPING EQUIPMENT:

Make and/or type Motive power

NORMAL

Capacity galls (..... m³) per hour. Suction at ft (..... m)

British Geological Survey

British Geological Survey

British Geological Survey

below well top. Amount pumped galls (..... m³) per day. Estimatedconsumption galls (..... m³) per week

Well made by Date of sinking

ADDITIONAL NOTES ANALYSIS (please attach copy if available)

LOG OF

British Geological Survey

British Geological Survey

STRATA

OVERLEAF

INSTITUTE OF GEOLOGICAL SCIENCES

British Geological Survey

British Geological Survey

HYDROGEOLOGY UNIT

EXHIBITION ROAD

LONDON SW7 2DE

Received from NWIA

..... MR. M. MONKHOUSE

Date 23.11.81

Observation well

Recorder

ER log

Site marked on

1" map 6" map—Grid Sheet 

(use symbol)

Copy to NW. ENGLAND

[illegible]

LANCASHIRE COUNTY COUNCIL

BOREHOLE DATA SHEET No. 1 OF 2

AINTREE-SKELMERDALE LINK ROAD M58

JOB No. 5906/1

B.H. No. 5906/1

DEPTH 16.3 m

GROUND LEVEL 23.7 m

SCHEME

LOCATION

MORE HICK LANE BRIDGE, N. PIER

Description of Stratum	Depth	Sample 123 Key	M.C.	LL/PL/PI Core Rec'y	Class'n	N Value	Water & Casing Details
TOP SOIL	0.3	114					STAINLESS 1.5 - 2.71
STIFF BROWN SILTY SANDY BOULDER CLAY	2.0	KJ U4	18.6 17.2	39-16-23	CI		British Geological Survey
FIRM BROWN SANDY SLIGHTLY STONY BOULDER CLAY	7.0	114 KJ U4 KJ U4 KJ	17.8 20.8 19.2 17.8 15.6 13.6	27-13-14	CL		STAINLESS 1.5 MAR SILV 1.8m CASING 3.0m
VERY STIFF BROWN SANDY STONY LOWER BOULDER CLAY WITH OCCASIONAL LARGE COBBLES		114 KJ E	10.9 19.3 11.0	26-13-13	CL		

STRENGTH TEST RESULTS

Depth of Sample	Bulk Dens'y (kg/m ³)	Dry Dens'y (kg/m ³)	M.C. (%)	Comp. Stress (kN/m ²)	Cohesion (kN/m ²)	ϕ	Remarks
1.0m - 1.5m	2100	1772	18.6	-	80	0°	75 x 38 mm x 12.5. 3. 3. T.
2.2m - 2.7m	2280	1936	17.8	-	53	0°	!
3.7m - 4.2m	2150	1804	19.2	-	46	0°	!
5.2m - 5.7m	2245	1794	15.6	-	48	0°	!
7.3m - 7.8m	2265	2042	10.9	-	21.2	0°	!

COMPACTION AND OTHER TEST RESULTS

Depth of Sample	Compaction	Dry Dens'y (kg/m ³)	M.C. (%)	S.G.	Air Voids	C.B.R.	SO ₃ gm/litre	pH	Remarks or other tests

GENERAL REMARKS

FORMERLY DESIGNATED B10/1

LANCASHIRE COUNTY COUNCIL

BOREHOLE DATA SHEET No. 3 OF 2

JOB No. S.F. 5906/1

B.H. No. 16.3 m

SCHEME

AINTREE-SKELMERDALE LINK ROAD M58

DEPTH 23.7 m

LOCATION

NICE NICK LANE BRIDGE, N. PIECE

GROUND LEVEL 23.7 m

Description of Stratum	Depth	Sample			M.C.	LL/PL/PI Core Rec'y	Class'n	N Value	Water & Casing Details
		1	2	3					
VERY STIFF BROWN SANDY STONY LOWER BOULDER CLAY WITH OCCASIONAL LARGE COBBLES	11.5			U9 K1	9.9 10.8		CL		5.30 PM 23 MAR. DRY 6.30 AM 24 MAR. DRY
VERY STIFF BROWN VERY SANDY LOWER BOULDER CLAY	13.6			SP	9.6		CL	95	12.30 PM 23 MAR. DRY CASING 1.9m 6.30 AM 24 MAR. DRY
VERY STIFF BROWN SANDY LOWER BOULDER CLAY	14.5			U9 K1	10.9		CL		
VERY DENSE UNIFORM FINE TO MEDIUM RED SAND (ROCKSAND)	16.0						SH		
WEATHERED RED FINE TO MEDIUM GRAINED SANDSTONE	16.3			SP				75/25	6.30 AM 24 MAR. DRY CASING 9.9m COMPLETED 24-3-71

STRENGTH TEST RESULTS

Depth of Sample	Bulk Dens'y (kg/m ³)	Dry Dens'y (kg/m ³)	M.C. (%)	Comp. Stress (kN/m ²)	Cohesion (kN/m ²)	ϕ	Remarks
10.5m - 10.8m	2356	2130	10.8	-	106	11°	75 x 38 mm DIA. G. U.T.
14.0m - 14.5m	2342	2116	10.9	-	167	8°	

COMPACTION AND OTHER TEST RESULTS

Depth of Sample	Compaction	Dry Dens'y (kg/m ³)	M.C. (%)	S.G.	Air Voids	C.B.R.	SO ₃ gm/litre	pH	Remarks or other tests

GENERAL REMARKS

APPENDIX E

Study Limitations

IMPORTANT: This section should be read before reliance is placed on any of the information, opinions, advice, recommendations or conclusions contained in this report.

1. This report has been prepared by Arcadis UK Ltd (Arcadis), with all reasonable skill, care and diligence within the terms of the Appointment and with the resources and manpower agreed with Peel Investments (North) Limited (the 'Client'). Arcadis does not accept responsibility for any matters outside the agreed scope.
2. This report has been prepared for the sole benefit of the Client unless agreed otherwise in writing.
3. Unless stated otherwise, no consultations with authorities or funders or other interested third parties have been carried out. Arcadis are unable to give categorical assurance that the findings will be accepted by these third parties as such bodies may have unpublished, more stringent objectives. Further work may be required by these parties.
4. All work carried out in preparing this report has used, and is based on, Arcadis' professional knowledge and understanding of current relevant legislation. Changes in legislation or regulatory guidance may cause the opinion or advice contained in this report to become inappropriate or incorrect. In giving opinions and advice, pending changes in legislation, of which Arcadis is aware, have been considered. Following delivery of the report, Arcadis have no obligation to advise the Client or any other party of such changes or their repercussions.
5. This report is only valid when used in its entirety. Any information or advice included in the report should not be relied upon until considered in the context of the whole report.
6. Whilst this report and the opinions made are correct to the best of Arcadis' belief, Arcadis cannot guarantee the accuracy or completeness of any information provided by third parties.
7. This report has been prepared based on the information reasonably available during the project programme. All information relevant to the scope may not have been received.
8. This report refers, within the limitations stated, to the condition of the Site at the time of the inspections. No warranty is given as to the possibility of changes in the condition of the Site since the time of the investigation.
9. The content of this report represents the professional opinion of experienced environmental consultants. Arcadis does not provide specialist legal or other professional advice. The advice of other professionals may be required.
10. Where intrusive investigation techniques have been employed they have been designed to provide a reasonable level of assurance on the conditions. Given the discrete nature of sampling, no investigation technique is capable of identifying all conditions present in all areas. In some cases the investigation is further limited by site operations, underground obstructions and above ground structures. Unless otherwise stated, areas beyond the boundary of the site have not been investigated.
11. If below ground intrusive investigations have been conducted as part of the scope, service tracing for safe location of exploratory holes has been carried out. The location of underground services shown on any drawing in this report has been determined by visual observations and electromagnetic techniques. No guarantee can be given that all services have been identified. Additional services, structures or other below ground obstructions, not indicated on the drawing, may be present on-site.
12. Unless otherwise stated the report provides no comment on the nature of building materials, operational integrity of the facility or on any regulatory compliance issues.

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Manchester M1 3BN
United Kingdom

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