

# Warth Business Park, Radcliffe

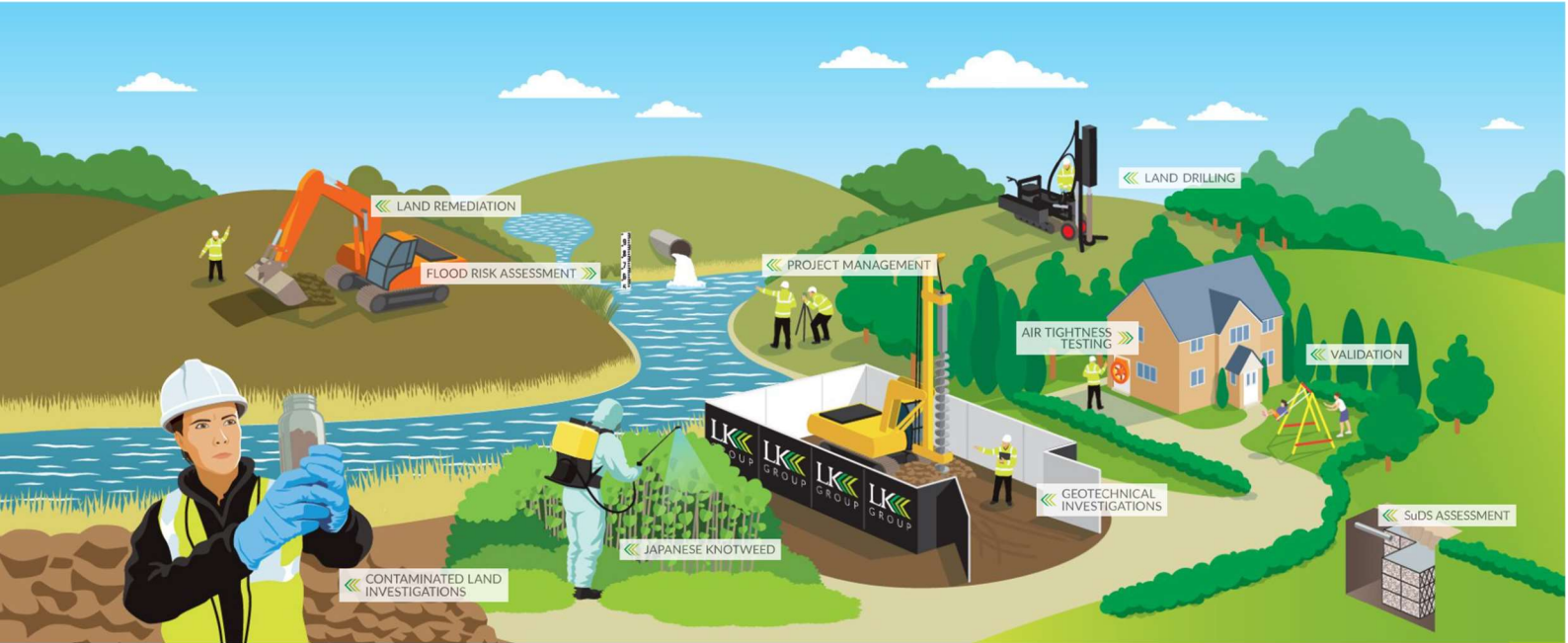
## Phase 1 Preliminary Risk Assessment

**Job Number:** LKC241231  
**Date:** July 2024  
**Client:** GFIC Properties Ltd



INCREASING LAND VALUE

LK  
GROUP



We advise and partner with our clients to design and deliver cost-effective consultancy, contracting and project management that enhances our environment and our communities.

Ground Investigation | Land Remediation | Project Management

LK
 

CONSULT

>> Eton Business Park, Eton Hill Rd, Radcliffe, Greater Manchester M26 2ZS  
 >> 0161 763 7200 >> [info@thelkgroup.com](mailto:info@thelkgroup.com) >> [www.thelkgroup.com](http://www.thelkgroup.com)

## DOCUMENT QUALITY ASSURANCE

|                     |                                                |
|---------------------|------------------------------------------------|
| <b>Site Address</b> | Warth Business Park, Warth Road, Bury, BL9 9NB |
| <b>Report Title</b> | Phase 1 Preliminary Risk Assessment            |
| <b>Job Number</b>   | LKC241231                                      |
| <b>Client</b>       | GFIC Properties Ltd                            |

|                      |                                                    |                      |            |
|----------------------|----------------------------------------------------|----------------------|------------|
| <b>Revision</b>      | 0                                                  | <b>Date of Issue</b> | 17/07/2024 |
| <b>Document Ref:</b> | LKC241231-A1-PRA-Warth Business Park, Radcliffe R0 |                      |            |
| <b>Status</b>        | Final                                              |                      |            |
| <b>Written By</b>    | Eryka Hayes and Joe Walker                         |                      |            |
| <b>Approved By</b>   | Hannah Moss                                        |                      |            |

### DISCLAIMER

This report has been prepared by LK Consult Ltd (LKC) who have exercised such professional skill, care and diligence as may reasonably be expected of a properly qualified and competent consultant, experienced in preparing reports of a similar scope.

However, to the extent that the report is based or relies upon information contained in records, reports or other materials provided to LKC, which have not been independently produced or verified, LKC gives no warranty, representation, or assurance as to the accuracy or completeness of such information.

This report is prepared solely for the benefit of the client named above. It may not be relied upon by or submitted to a third party for their reliance for the purposes of valuation, mortgage, insurance, and regulatory approval until all invoices have been settled in full.

Those using this information in subsequent assessments or evaluations do so at their own risk.

## TABLE OF CONTENTS

|      |                                                  |    |
|------|--------------------------------------------------|----|
| 1.   | INTRODUCTION .....                               | 1  |
| 2.   | HISTORICAL REVIEW .....                          | 2  |
| 3.   | ENVIRONMENTAL SETTING .....                      | 4  |
| 4.   | SITE RECONNAISSANCE .....                        | 6  |
| 5.   | PRELIMINARY CONCEPTUAL MODEL .....               | 9  |
| 5.1. | Introduction .....                               | 9  |
| 5.2. | Potential Contaminants .....                     | 9  |
| 5.3. | Potential Receptors .....                        | 10 |
| 5.4. | Potential Pathways .....                         | 10 |
| 5.5. | Preliminary Contamination Conceptual Model ..... | 11 |
| 6.   | PRELIMINARY GEOTECHNICAL RISK ASSESSMENT .....   | 13 |
| 7.   | SUMMARY CONCLUSIONS AND RECOMMENDATIONS.....     | 14 |
| 7.1. | Summary Conclusions .....                        | 14 |
| 7.2. | Recommendations .....                            | 15 |

## FIGURES

Figure 1 – Site Location and Boundary Plan

## APPENDICES

Appendix A – Historical Maps  
 Appendix B – Envirocheck Report  
 Appendix C – Historical BGS Boreholes  
 Appendix D – Zetica UXO Unexploded Bomb Risk Map  
 Appendix E – Risk Evaluation  
 Appendix F – References

## 1. Introduction

LK Consult Ltd (LKC) has been commissioned to carry out a Phase 1 Preliminary Risk Assessment (PRA) for Warth Business Park, Radcliffe.

In accordance with current guidance (including LCRM<sup>1</sup> and the National Planning Policy Framework (NPPF)<sup>2</sup>), the PRA will include a site reconnaissance, site history, geology, hydrogeology, hydrology, mineral search, and a landfill search. Information gathered from the desk study and site reconnaissance will be used to develop a contamination conceptual model for the site.

In addition, the information gathered will be used to identify potential geotechnical constraints associated with the redevelopment of the site.

Based on the findings of this report, an appropriate site investigation can be derived, if required.

A summary of the site details is presented in Table 1-1. Figure 1 indicates the site location and boundary plan.

|                             |                                                                                                                               |
|-----------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| <b>Location</b>             | North of River Irwell, south of Warth Road and west of Radcliffe Road.<br>Centred at National Grid Reference 379580E 409170N. |
| <b>Area</b>                 | 5.71Ha.                                                                                                                       |
| <b>Topography</b>           | 73 metres above ordnance datum (AOD).<br>Site is approximately level.                                                         |
| <b>Current Site Use</b>     | Industrial Park.                                                                                                              |
| <b>Proposed Development</b> | The proposed development is unknown at this stage. It is assumed that the site will remain as industrial / commercial use.    |

Table 1-1: Summary of site details.

## 2. Historical Review

In compiling the site history, LKC consulted Envirocheck historical mapping (Appendix A) and other public domain maps / aerial photography.

Table 2-1 summarises features on site. Table 2-2 summarises potentially contaminative land uses within approximately 50m and potentially infilled features within approximate 250m.

| Site Features                          | Location on Site | Dates Present |         | Comments                                                                                                                                                                                                                                                                 |
|----------------------------------------|------------------|---------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                        |                  | From          | To      |                                                                                                                                                                                                                                                                          |
| Coal pit                               | NW               | 1850          | 1850    | Only present on 1850 mapping.                                                                                                                                                                                                                                            |
| Warth cotton, paints and varnish mills | E & W            | 1889          | Present | Cotton mill from 1889 until 1937 mapping. Several unreferenced structures present in NW by 1955 mapping. Additional building present on west and centre of site from 1967 mapping. Becomes paint and varnish mill. Annotated as Warth Industrial Park from 2016 mapping. |
| School                                 | NE               | 1889          | 1938    | No longer present after 1938 mapping.                                                                                                                                                                                                                                    |
| 2no. reservoirs                        | Centre           | 1889          | 1975    | Becomes 1 reservoir in 1894. Reduction in size noted by 1957 mapping. No longer present after 1975.                                                                                                                                                                      |
| Chimney                                | SE               | 1889          | 1965    | No longer present after 1965 mapping.                                                                                                                                                                                                                                    |
| 4no. tanks                             | S                | 1957          | present | 1no. tank no longer present after 1982 mapping. Remaining 3 tanks are still present.                                                                                                                                                                                     |
| Terraced Housing                       | NE               | 1957          | 1970    | No longer present by 1980 mapping.                                                                                                                                                                                                                                       |
| Tank                                   | S                | 1967          | 1970    | No longer present by 1980 mapping.                                                                                                                                                                                                                                       |
| Electricity Substation                 | N                | 2024          | Only    | Present on current mapping only.                                                                                                                                                                                                                                         |

Table 2-1: Summary of site features. Dates are based on available historical map editions.

| Surrounding Area Features | Distance (m) | Direction | Dates Present |      | Comments                                                                                           |
|---------------------------|--------------|-----------|---------------|------|----------------------------------------------------------------------------------------------------|
|                           |              |           | From          | To   |                                                                                                    |
| Coal pit                  | 140          | W         | 1850          | 1850 | Only present on 1850 mapping.                                                                      |
| Old gasometer             | 140          | N         | 1889          | 1894 | No longer present after 1894 mapping.                                                              |
| Reservoir                 | 215          | N         | 1889          | 1980 | No longer present after 1980 mapping. Becomes marsh land until 1992.                               |
| Refuse tip                | 135          | N         | 1967          | 1980 | No longer present after 1980 mapping.                                                              |
| Refuse tip                | 110          | SE        | 1976          | 2024 | Disused from 1989 to present mapping. No longer present on current mapping and aerial photography. |
| Works                     | 25           | N         | 1987          | 2016 | No longer present after 2016.                                                                      |

Table 2-2: Summary of potentially contaminative features within 50m and potentially infilled features within 250m. Dates are based on available historical map editions.

Plate 2-1 shows an extract from the 1935 mapping, indicating the extent of the Warth cotton, paints and varnish mill complex.

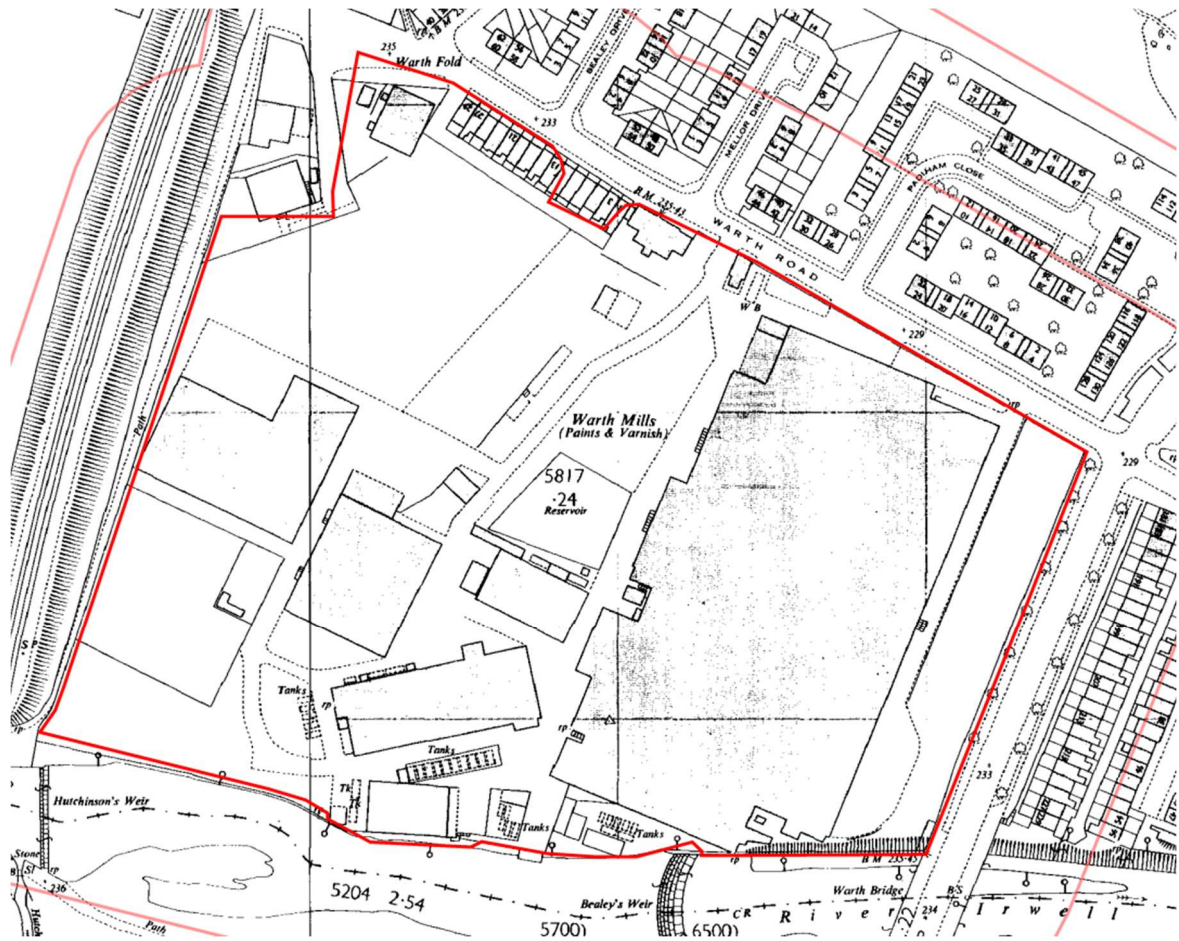


Plate 2-1: Extract from 1935 mapping.

### 3. Environmental Setting

A summary of environmental settings is presented in Table 3-1, based on a review of available environmental data.

| Categories <sup>(data sources)</sup> |                                    |             | Details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|--------------------------------------|------------------------------------|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Geology <sup>1, 2, 3</sup>           | Artificial Ground                  |             | No BGS recorded artificial ground.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                                      | Superficial Deposits               |             | Alluvium (clay, silt, sand and gravel).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|                                      | Bedrock                            |             | Pennine Lower Coal Measures Formation (mudstone, siltstone and sandstone).<br>Coal seam sub cropping on site in the south-west (Hell Hole Mine).                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|                                      | BGS Logs (100m)                    |             | BH Ref: SD70NE448, 24m N: made ground to 0.85m, slightly organic sandy clay to 2.00m, gravelly fine to medium sand to 2.45m.<br>BH Reference, 52m N: SD70NE450: made ground to 1.3m, gravel to 2.45m.<br>BH Ref: SD70NE447, 61m N: made ground to 0.06m, firm sandy slightly gravelly clay to 0.20m, medium dense gravel and sand to 1.05m , medium dense sandy gravel to 2.70, medium dense sandy gravel to 3.00m<br>BH Reference: SD70NE449, 75m N: made ground to 1.70m, clay to 2.45m.<br>BH Reference: SD70NE446, 88m N: made ground to 0.5m, gravel to 3.4m, clay to 6.0m. |
| Hydro-geology <sup>1</sup>           | Aquifer Designation                | Superficial | Secondary A Aquifer.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                                      |                                    | Bedrock     | Secondary A Aquifer.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                                      | Source Protection Zone (SPZ)       |             | Site not within an SPZ.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|                                      | Groundwater Abstractions (100m)    |             | None.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Hydrology <sup>1</sup>               | Surface Watercourses (100m)        |             | River Irwell adjacent to S boundary flowing E.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|                                      | Flooding Risk <sup>1, 4</sup>      |             | Flood Zone 3.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|                                      | Surface Water Abstractions (100m)  |             | 2no. 12m W for process water.<br>12m W for general cooling.<br>41m S for hydroelectric power generation.                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                                      | Discharge Consents (onsite)        |             | Trade discharge-site drainage, 17m SE into the River Irwell.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                                      | Pollution Incidents (onsite)       |             | None.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Minerals & Mining <sup>1,3</sup>     | Coal Mining                        |             | Within a Coal Reporting Area.<br>South of site within a Development High Risk Area.<br>Mine entry present adjacent E. Potential zone of influence encroaches onto site.                                                                                                                                                                                                                                                                                                                                                                                                          |
|                                      | Surface Mineral Extractions (250m) |             | None.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|                                      | Non-Coal Mining Area               |             | No hazard.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

Table 3-1: Summary of the environmental setting.

**Notes:** Distance in brackets is the distance from site that features are included. Where no distance given, features relate to onsite only.

**Data Sources:**

**1** Envirocheck Report (Appendix A & B).

**2** <http://mapapps2.bgs.ac.uk/geoindex/home.html>

**3** The Coal Authority Web Mapping Services (WMS) / <http://coal.decc.gov.uk/en/coal/cms/publications/data/map/map.aspx>.

**4** <https://flood-map-for-planning.service.gov.uk/location>

| Categories <sup>(data sources)</sup>                          |                                                                              | Details                                                                                                                                                                                                                                                                                                                                                                                                                |
|---------------------------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Ground Stability <sup>1</sup>                                 | Collapsible Ground                                                           | No hazard.                                                                                                                                                                                                                                                                                                                                                                                                             |
|                                                               | Compressible Ground                                                          | Moderate hazard.                                                                                                                                                                                                                                                                                                                                                                                                       |
|                                                               | Ground Dissolution                                                           | No hazard.                                                                                                                                                                                                                                                                                                                                                                                                             |
|                                                               | Landslide                                                                    | Very low hazard.                                                                                                                                                                                                                                                                                                                                                                                                       |
|                                                               | Running Sand                                                                 | Low hazard.                                                                                                                                                                                                                                                                                                                                                                                                            |
|                                                               | Shrinking / Swelling Clay                                                    | Very low hazard.                                                                                                                                                                                                                                                                                                                                                                                                       |
| Landfill Sites (250m) <sup>1</sup>                            | Known / Registered                                                           | 2no within 250m.<br>47m SE: 'Crawford Bros Ltd'. BGS recorded landfill.<br>49m SE: 'Wimpey Waste Management Limited'. Deposited waste included inert, industrial, commercial and household waste. Operational dates not supplied.                                                                                                                                                                                      |
|                                                               | Potentially Infilled Land (non-water and water), based on Envirocheck Report | 4no. features (Non-Water): 0m NW, 143m W, 237m NW and 250m NW.<br>6no. features (Water): 0m SE, 75m SW, 79m S, 82m SW, 113m E, 207m N.                                                                                                                                                                                                                                                                                 |
|                                                               | Potentially Infilled Sites, based on LKC historical review                   | 17no. features: See Table 2-1 and Table 2-2.                                                                                                                                                                                                                                                                                                                                                                           |
| Radon Potential <sup>1</sup>                                  |                                                                              | <1% of homes above Action Level. No protective measures are necessary in the construction of new dwellings or extensions.                                                                                                                                                                                                                                                                                              |
| Designated Sites (50m) <sup>1</sup>                           |                                                                              | Adopted Green Belt 23m SW.                                                                                                                                                                                                                                                                                                                                                                                             |
| Contemporary Trade Directory (50m) <sup>1</sup>               |                                                                              | 11no. onsite to NW, NE, E and W including car dealers, chemical manufacturers, cosmetic manufacturers, engine rebuilding and reconditioning, photocopiers, recycling services, soft drink manufacturers, freight forwarders, window film manufacturers, shredding equipment and services, cosmetic manufacturers, pallets, craters and packing cased, and soil services, replacement and repairs, engineering works. . |
| Fuel Station Entries (50m) <sup>1</sup>                       |                                                                              | None.                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Unexploded Ordnance Risk (UXO) – Zetica Risk Map <sup>5</sup> |                                                                              | Bomb Risk: Low.<br>Strategic Targets: None identified within 100m.                                                                                                                                                                                                                                                                                                                                                     |

Table 3-2 (continued): Summary of the environmental setting.

**Notes:** Distance in brackets is the distance from site that features are included. Where no distance given, features relate to onsite only.

**Data Sources:**

**1** Envirocheck Report (Appendix A & B).

**5** Zetica UXO Unexploded Bomb Risk Map (Appendix D).

## 4. Site Reconnaissance

A site reconnaissance was carried out on 1<sup>st</sup> July 2024. At the time of the walkover, LKC were unable to access the full site as some areas were either unsafe, currently in-use, or had demolition / construction works being carried out.

Relevant features identified on site are summarised below:

- The site is accessible through a large double gate approximately 8m wide in the north of the site.
- Ground cover generally comprised concrete in the central and western areas of site, with some areas patched with tarmacadam (good condition). The east of the site generally comprised tarmacadam (good condition) with limited grassed areas present along the eastern boundary of the site.
- Site is relatively flat.
- Approximately half of the site is occupied by buildings. Large brick industrial warehouse buildings occupy most of the eastern half of the site. No obvious external evidence of possible subsidence.. Large metal industrial warehouse buildings occupy most of the western half of the site and noted to be unsafe to enter i.e. collapsing walls and damaged roofing.
- A large derelict two storey brick building was present in the central area of the site with a side tower building of approximately double the buildings height. An in-use brick two storey office building is also present in the north of the site.
- Anecdotal evidence suggested that one of the warehouse buildings in the southeast of the site had ACM (cement and boards).
- Pigeons noted inside many of the warehouse buildings, particularly in the west of the site, with a large amount of faeces on the floors of the buildings. Buildings were inaccessible for this reason.
- At the time of the walkover, construction work was ongoing in the centre and south / south-eastern areas of site. Piles of demolition rubble were present in these areas, as well as excavated pits.
- Several monitoring wells from historic boreholes were noted across the site.
- A pump house was noted in the south-east of the site.
- A large amount of shipping containers were present across the site. Anecdotal evidence suggested these were emptied when the old business park tenants left the site.
- Large Ad-Blue tanks were stored in the centre of the site. Anecdotal evidence suggested these were new and recently imported onto the site. No spills were noted.

The surrounding area comprises the River Irwell along the southern boundary of site, housing estates to the east and north of the site, and a Metrolink line along the western boundary of the site.

Site photographs are provided in Table 4-2.

|                                                                                              |                                                                                                               |
|----------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
|             |                             |
| <p><b>Photograph 1:</b> View of site entrance, from the N of the site, looking N.</p>        | <p><b>Photograph 2:</b> View of E of the site, from the SE, looking N. Showing existing buildings.</p>        |
|            |                            |
| <p><b>Photograph 3:</b> View of the central N area of site, from the centre, looking NW.</p> | <p><b>Photograph 4:</b> View of E / NE of site, from centre, looking NE showing existing buildings</p>        |
|           |                           |
| <p><b>Photograph 5:</b> Inside of accessible warehouse building in the NE of the site.</p>   | <p><b>Photograph 6:</b> View of SE of site from centre, looking SE. Green buildings are currently in-use.</p> |
|           |                           |
| <p><b>Photograph 7:</b> Existing office building in N of site.</p>                           | <p><b>Photograph 8:</b> View of SW of site from W, looking S.</p>                                             |

Table 4-1: Site photographs.

Site features are also shown on Plate 4-1.



Plate 4-1: Plan showing relevant site features.

## 5. Preliminary Conceptual Model

### 5.1. Introduction

The aim of the conceptual model is to provide a preliminary assessment of the likelihood of a pollutant linkage for each potential combination of contaminant, pathway, and receptor. A conceptual model can be used to make an informed decision on the contamination risks associated with the site and whether further site investigation work is required.

The sections below are therefore divided into potential contaminant, potential pathway and potential receptor as described in LCRM<sup>3</sup>, on the premise that, if there is no pollutant linkage, then there will be no risk to the receptor. The final section provides an assessment of the potential pollutant linkages that may still be present on the site if redevelopment were to occur.

### 5.2. Potential Contaminants

Potential viable contamination sources are detailed in Table 5-1. These are split into onsite sources, offsite sources and underlying geology.

| Potential Source                                                                                                 | Contaminants                                                                                                                                                                                                                                                                                                                                                                                                                     |
|------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>On site</b>                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Shallow made ground below most of site. (general made ground, former field boundary, chimneys, school)           | Assuming predominantly reworked natural soils with possible demolition rubble, ash and clinker: asbestos, heavy metals, sulphates, Not expected to be a significant source of gas given anticipated depth and nature of made ground.                                                                                                                                                                                             |
| Localised deep made ground below centre and north-west of site (former reservoirs, infilled basements, coal pit) | Demolition rubble, ash, and clinker: asbestos, heavy metals, sulphates, PAHs <sup>4</sup> .<br>Other fill material sources: unknown organic / inorganic compounds. If organic / putrescible material: hazardous gas (principally carbon dioxide and methane). Given age of infilled reservoir (approximately 50 years) and nature of likely development (commercial/industrial), risk is expected to be low.                     |
| Cotton, paints and varnish mill, tanks                                                                           | Metals, PAHs, inorganic compounds, chlorinated organic solvents, asbestos, organic compounds, petroleum hydrocarbons, ketones, esters, surfactants and PCBs.<br>If coal fired boiler: heavy metals, sulphates and PAHs; if gas or oil powered boiler: oils and fuel.<br>Asbestos may have been used within the building as insulation and lagging or as roofing and cladding <sup>5</sup> . Asbestos noted during site walkover. |
| Current electricity substation (post 1980s)                                                                      | Assuming ongoing maintenance, hardstood ground and no Polychlorinated biphenyl (PCBs) use: no significant contamination anticipated.                                                                                                                                                                                                                                                                                             |
| Tanks                                                                                                            | Petroleum Hydrocarbons.                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Surrounding Area</b>                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Surrounding area (works)                                                                                         | Not expected to be as significant as sources identified on site.                                                                                                                                                                                                                                                                                                                                                                 |
| Reservoir (215m N), refuse tip (140m N)                                                                          | Given size, distance and age of features, there is not considered to be a source of hazardous gas.                                                                                                                                                                                                                                                                                                                               |
| Potentially infilled features and landfill within 250m                                                           | Potential source of hazardous gas identified.<br>Significant lateral migration of gasses from refuse tip /BGS landfill not expected as River Irwell likely to act as barrier between sites.                                                                                                                                                                                                                                      |

Table 5-1: Potential contamination sources.

| Underlying Geology                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|---------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Pennine Lower Coal Measures (bedrock) | Ground Gas (principally carbon dioxide and methane) <sup>6</sup> . Potentially worked shallow coal seams could be a source of ground gas. Mine entry present adjacent east of site- potential zone of influence encroaches onto site. Hell Hole Mine seam indicated to subcrop in the southwestern part of the site. Trencherbone seam (expected at 33-41m and 66-81m depth below the north and south of site respectively) has the potential to spontaneously combust when being entered, worked, or disturbed <sup>7</sup> . In addition, if roof coal is left, this could also pose a risk. |
| Radon Affected Area                   | <1% of homes above Action Level. No protective measures are necessary in the construction of new dwellings or extensions. No further consideration required.                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Superficial                           | Alluvium (clay, silt, sand and gravel). Limited amounts of gas can be generated from alluvium with low flow rates.                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

Table 5-2 (continued): Potential contamination sources.

### 5.3. Potential Receptors

Potential receptors are detailed in Table 5-2.

| Receptors            |                                                                                                                                                                                                                                  |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Human health         | Future site users (including visitors, and site workers). Offsite land users. As the proposed development is for commercial / industrial use, the most sensitive receptors (children) have not been included in this assessment. |
| Controlled waters    | River Irwell adjacent to the south of the site. Secondary A Aquifer.                                                                                                                                                             |
| Buildings.           |                                                                                                                                                                                                                                  |
| Potable water pipes. |                                                                                                                                                                                                                                  |

Table 5-3: Potential receptors.

### 5.4. Potential Pathways

Potential pathways are detailed in Table 5-3.

| Pathways      |                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                         |
|---------------|-----------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Soil          | Human health <sup>8</sup> (commercial land use with soft landscaping)                                                 | Ingestion of soil.<br>Ingestion of soil-derived indoor dust.<br>Dermal contact with soil.<br>Dermal contact with soil-derived indoor dust.<br>Inhalation of soil-derived outdoor dust.<br>Inhalation of soil-derived indoor dust.<br>Inhalation of vapours outside.<br>Inhalation of vapours inside.<br><br>Omitted: ingestion of contaminated home-grown produce and ingestion of soil attached to home-grown produce. |
| Soil          | Windblown dust and fibres to adjacent receptors.                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Soil          | Direct contact with receptors (services).                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Surface water | Surface run-off over impermeable surface.                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Groundwater   | Infiltration into the ground, through potentially contaminated material (contamination possibly going into solution). |                                                                                                                                                                                                                                                                                                                                                                                                                         |

|                     |                                                                                                                                                                                                                                                                                                                                                |
|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Groundwater and gas | <p>Migration through potentially permeable strata and preferential pathways.</p> <p>Superficial (alluvium) likely to be variably permeable.</p> <p>Bedrock (mudstone, siltstone, sandstone) likely to be variably permeable.</p> <p>Preferential pathways: adjacent River Irwell, services, possible shallow worked coal seams, mine shaft</p> |
| Gas                 | <p>Migration into buildings (e.g., via services) and accumulation of gases in confined spaces (potentially causing explosion if methane is present).</p> <p>The mine entry within 10m of the site boundary could provide a preferential pathway for gas risk associated with the Trencherbone coal seam.</p>                                   |

Table 5-4: Potential pathways.

## 5.5. Preliminary Contamination Conceptual Model

The Preliminary Contamination Conceptual Model is illustrated in Table 5-4.

Generic potential pollutant linkages are described along with an assessment of the risk based upon guidance on probabilities and consequences outlined in CIRIA C552<sup>9</sup>.

In order to assess the potential risk for each pollutant linkage, an assessment of the magnitude of the potential consequence (severity) of the risk occurring and the magnitude of the probability (likelihood) of the risk occurring has been considered and classified. This is based on the guidance provided in CIRIA C552 and further details including a risk matrix is provided in Appendix E.

The probability is based on the site history, site reconnaissance, environmental setting, pathways, and receptors. Reasonable worst-case consequence has been assumed at this stage. Where LKC identified a low to very low risk, targeted or low-density intrusive investigation work, a watching brief (during construction work) or no investigation work will be recommended. This will be dependent on the nature of the site and the proposed development.

Where the risk falls into the moderate/low risk, LKC will undertake an assessment to establish what further work will be required. Where LKC identifies a moderate or higher risk, intrusive investigation work or precautionary remediation is recommended.

Recommendations are discussed further in Section 7.

Due to the minor consequence associated with the phytotoxic effect to flora (i.e., loss of plants in a landscaping scheme), the overall risk for the majority of sites will be very low to low. Where soils contain significant concentrations of heavy metals, in general there will be other pollutant linkages (i.e., the risk to human health) that will trigger the requirement for remediation (e.g., a clean environmental cover system). As such the risk to flora associated with phytotoxic contaminants will not be considered further.

The risk to buildings associated with elevated sulphate will be considered as part of the geotechnical assessment and will not be included in the contamination risk assessment.

It should be noted that there may be risk from short term exposure from contaminated soil to site workers. The Preliminary Contamination Conceptual Model deals with long term exposure to key receptors. Acute risks can be easily mitigated by good environmental management of the site during site works. Standard health and safety precautions (as per HSE guidance<sup>10</sup>) should be adopted by all workers involved with site enabling and construction works. Therefore, this receptor is not considered in the contamination conceptual model.

| PL | Contaminants of Concern (source)                                                                                                                                                                             | Pathway                                                                                                                              | Receptor                                               | Probability    | Consequence | Risk     |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|----------------|-------------|----------|
| 1  | Metals, PAHs, inorganic compounds, chlorinated organic solvents, asbestos, organic compounds, ketones, esters, surfactants and PCBs.<br>(Cotton, paints and varnish mill, made ground, demolished buildings) | Dermal contact.<br>Inhalation of soil, fibres, and dust.<br>Ingestion of soils, dust.<br>Windblown dust.                             | Future site users.<br>Offsite receptors.               | Likely         | Medium      | Moderate |
| 2  | Petroleum hydrocarbons, naphthalene (made ground, Cotton, paints and varnish mill)                                                                                                                           | Inhalation of vapours.<br>Migration via permeable strata and preferential pathways.                                                  | Future site users.<br>Offsite receptors.               | Likely         | Medium      | Moderate |
| 3  | Hazardous gas: methane, carbon dioxide (infilled reservoir, potentially infilled basements, made ground)                                                                                                     | Migration via permeable strata and preferential pathways.<br>Coal mine 10m N.<br>Inhalation of gas.<br>Explosion in confined spaces. | Future site users.<br>Buildings.<br>Offsite receptors. | Low Likelihood | Severe      | Moderate |
|    | Ground gas: methane, carbon dioxide (alluvium, possible shallow worked coal seams, Trencherbone coal seam)                                                                                                   |                                                                                                                                      |                                                        | Low likelihood | Severe      | Moderate |
| 4  | Petroleum hydrocarbons, PAHs, metals (Cotton, paints and varnish mill, tanks, made ground)                                                                                                                   | Surface run-off.<br>Migration via permeable strata and preferential pathways.<br>Perched waters migration.                           | Groundwater<br>Surface water                           | Likely         | Medium      | Moderate |
| 5  | Petroleum hydrocarbons, naphthalene (Cotton, paints and varnish mill, tanks, made ground)                                                                                                                    | Permeation of pipes.<br>Ingestion of tainted water supply.                                                                           | Future site users.<br>Water pipes.                     | Likely         | Medium      | Moderate |

Table 5-5: Preliminary Contamination Conceptual Model.

**Notes:** PL = Pollutant Linkage. Contaminant of Concern (CoC) - See Table 5-1 for contamination sources. See Section 7 for recommendations.

## 6. Preliminary Geotechnical Risk Assessment

Table 6-1 summarises the possible geotechnical constraints of the site, based on the site history, environmental settings and site reconnaissance. Investigation work will be required to confirm the risks and provide a detailed geotechnical assessment and foundation design for any new development.

|                                             |                                                                                                                                                                                                                                                                                                                                                                                                                    |
|---------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Coal Mining</b>                          | Site is within a development high risk area. A Coal Mining Risk Assessment has been undertaken under a separate cover (document ref. LKC241231-A2-CMRA-Warh Business Park, Radcliffe R0).                                                                                                                                                                                                                          |
| <b>Slope Stability</b>                      | Site is relatively flat. No further action required.                                                                                                                                                                                                                                                                                                                                                               |
| <b>Envirocheck Ground Stability Hazards</b> | Moderate Risk identified for Compressible Ground. Further action required (see below).                                                                                                                                                                                                                                                                                                                             |
| <b>Made Ground</b>                          | Unknown depth and constituent of made ground across the site. Initial information indicates relatively deep made ground in the centre of the site and northern edge (infilled reservoirs and possible basements), and shallow made ground across the rest of the site. Possible in-ground structures from previous developments. Unlikely to be a suitable founding stratum unless engineering work is undertaken. |
| <b>Superficial</b>                          | Unknown strength of soils for foundation design. Alluvium (clay, silt, sand and gravel) anticipated below the site. Strata may be variable giving differential settlement.                                                                                                                                                                                                                                         |
| <b>Bedrock</b>                              | Unknown depth to bedrock. Strength and extent of weathering unknown.                                                                                                                                                                                                                                                                                                                                               |
| <b>Groundwater</b>                          | Unknown depth and variability of groundwater. Shallow / fluctuating groundwater can affect the strength of the soil, particularly in granular ground. Shallow groundwater can also affect construction works.                                                                                                                                                                                                      |
| <b>Plasticity</b>                           | Plasticity of clay deposits should be confirmed, particularly where trees are present or proposed, to identify the shrink / swell risk.                                                                                                                                                                                                                                                                            |
| <b>Sulphate</b>                             | Unknown sulphate content of the made ground and natural.                                                                                                                                                                                                                                                                                                                                                           |
| <b>Road / Pavement Design</b>               | Unknown CBR values for footpath and road design.                                                                                                                                                                                                                                                                                                                                                                   |

Table 6-1: Summary of geotechnical constraints.

## 7. Summary Conclusions and Recommendations

### 7.1. Summary Conclusions

Table 7-1 summarises the site details, historical review, environmental settings and site reconnaissance.

|                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|--------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Current Site Use &amp; Pertinent Features</b> | Industrial Park covers the whole site. Brick buildings in the east, west and central of site and hardstood for the remainder of site. Site enclosed by metal fencing.                                                                                                                                                                                                                                                                     |
| <b>Proposed Development</b>                      | The proposed development is unknown at this stage. It is likely to be retained for commercial / industrial use.                                                                                                                                                                                                                                                                                                                           |
| <b>Main Historical Features</b>                  | Onsite: Coal pit, Warth cotton, paints and varnish mills, school, 2no. reservoirs, chimney, 5no. tanks, terraced housing, electricity substation.<br>Surrounding Area: Coal pit, old gasometer, reservoir, 2no. refuse tips, works.                                                                                                                                                                                                       |
| <b>Geology / Hydrogeology</b>                    | Artificial: No BGS recorded artificial.<br>Superficial: Alluvium (clay, silt, sand and gravel). Secondary A Aquifer.<br>Bedrock: Pennine Lower Coal Measures Formation (mudstone, siltstone and sandstone). Secondary A Aquifer.                                                                                                                                                                                                          |
| <b>Site Reconnaissance</b>                       | Site generally comprises groundcover of concrete in the centre and west and tarmacadam in the east. Approximately half the site is occupied by buildings, mostly brick or metal industrial units. Pigeon faeces and possible ACM noted to be present in industrial units. Much of the site was inaccessible at the time of the walkover. Monitoring wells noted across the site. No visual contamination or spills noted across the site. |
| <b>Landfills / Infilled ground</b>               | No recorded landfills. Potentially infilled ground identified.                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Development High Risk Area</b>                | The south of the site is within a development high risk area. A coal mining risk assessment has been carried out under separate cover. Further assessment is required.                                                                                                                                                                                                                                                                    |

Table 7-1: Summary of site details, historical review, environmental settings and site reconnaissance.

A preliminary contamination conceptual model has been produced by LKC, which is summarised in Table 7-2.

| <b>Pollutant Linkage</b>                                                                                                            | <b>Contaminants</b>                                                                                                                  | <b>Risk</b> |
|-------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|-------------|
| <b>PL1:</b> Contaminants posing a risk to receptors via dermal contact, ingestion and inhalation (of soil, dust, fibres).           | Metals, PAHs, inorganic compounds, chlorinated organic solvents, asbestos, organic compounds, ketones, esters, surfactants and PCBs. | Moderate    |
| <b>PL2:</b> Volatile contaminants posing a risk to receptors via the inhalation of vapours.                                         | Petroleum hydrocarbons, naphthalene (made ground, Cotton, paints and varnish mill)                                                   | Moderate    |
| <b>PL3:</b> Gas posing a risk to buildings and receptors via the migration of gas into building causing explosion and asphyxiation. | Hazardous / ground gas: methane, carbon dioxide (infilled reservoir, infilled basements)                                             | Moderate    |
|                                                                                                                                     | Hazardous / ground gas: methane, carbon dioxide                                                                                      | Moderate    |

Table 7-2: Summary risk table.

| Pollutant Linkage                                                                                               | Contaminants                                                                               | Risk     |
|-----------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|----------|
| <b>PL4:</b> Mobile contamination posing a risk to controlled waters via the migration through permeable strata. | Petroleum hydrocarbons, PAHs, metals (Cotton, paints and varnish mill, tanks, made ground) | Moderate |
| <b>PL5:</b> Organic contaminants posing a risk to receptors.                                                    | Petroleum hydrocarbons, naphthalene (Cotton, paints and varnish mill, tanks, made ground)  | Moderate |

Table 7-3 (continued): Summary risk table.

A preliminary geotechnical assessment has been carried out by LKC. Table 7-3 summarises the geotechnical constraints.

|                               |                                                                                                                                                                                 |
|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Coal Mining</b>            | Site is within a development high risk area. A Coal Mining Risk Assessment has been undertaken under a separate cover (ref. LKC241231-A2-CMRA-Warh Business Park, Radcliffe R0) |
| <b>Slope Stability</b>        | Site is relatively flat. No further assessment required.                                                                                                                        |
| <b>Made Ground</b>            | Unknown depth and constituent of made ground across the site. Possible deep made ground located in some areas of site.                                                          |
| <b>Superficial</b>            | Unknown strength of soils for foundation design. Alluvium anticipated below the site.                                                                                           |
| <b>Bedrock</b>                | Unknown depth of bedrock.                                                                                                                                                       |
| <b>Groundwater</b>            | Unknown depth and variability of groundwater.                                                                                                                                   |
| <b>Plasticity</b>             | Plasticity of clay deposits should be confirmed.                                                                                                                                |
| <b>Sulphate</b>               | Unknown sulphate content of the made ground and natural.                                                                                                                        |
| <b>Road / Pavement Design</b> | Unknown CBR values for footpath and road design should be calculated.                                                                                                           |

Table 7-4: Summary of geotechnical constraints.

Based upon the available information, LKC conclude there is a viable contamination and geotechnical risk and therefore further assessment is recommended.

## 7.2. Recommendations

Recommendations are provided in Table 7-4.

|                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Contamination Status</b>               | There is sufficient information on the potential contaminative status of the site to allow conditional approval of a planning application, based on the proposed end use detailed in the PRA.                                                                                                                                                                                                                                                                                                                                                |
| <b>Further Assessment Recommendations</b> | Watching brief during construction work (groundworks).<br>Phase 2 investigation to be carried out in line with current guidance, including BS10175 <sup>11</sup> , BS5930 <sup>12</sup> CIRIA C665 <sup>13</sup> , RB17 <sup>14</sup> and BS8485 <sup>15</sup> .<br>'Exploratory investigation': 1 sample per 25-50m square centres. Or 'detailed investigation': 1 sample per 10-25m square centres. Plus, targeted investigation locations in areas of concern (contamination and geotechnical).<br>To be agreed with the local authority. |
| <b>Local Authority Approval</b>           | Conditional planning approval is likely to require an agreed detailed scope of work.                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Type of Investigation Work</b>         | Boreholes and / or trial pits.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

Table 7-5: Recommendations.

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                            |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>PL 1, 2, 5</b>               | Intrusive investigation work recommended to confirm ground conditions across the site.<br>Testing of contaminants of concern based on preliminary conceptual model and field observations (PID tests and visual / olfactory evidence).                                                                                                                                                                     |
| <b>PL 3</b>                     | Intrusive investigation to confirm ground conditions. If significant gas source and pathway identified, gas monitoring or gas protection measures required.<br>Gas monitoring: monitoring wells to be installed in boreholes, monitoring frequency and period subject to anticipated risk.<br>Precautionary gas protection measures: type of measures to be determined once ground conditions established. |
| <b>PL 4</b>                     | Groundwater and surface water sampling.<br>Groundwater samples to be collected from monitoring wells and tested for contaminants of concern based on preliminary conceptual model and ground conditions encountered.<br>Surface water samples to be collected from the watercourse. A minimum of 3no. samples to be collected (upstream, midstream and downstream).                                        |
| <b>Reporting</b>                | Information from the above can be used to carry out a contamination and geotechnical assessment and provide a remediation strategy for the site.                                                                                                                                                                                                                                                           |
| <b>Unexpected Contamination</b> | If unexpected contamination is identified during groundworks, further assessment will be required.                                                                                                                                                                                                                                                                                                         |

Table 7-6 (continued): Recommendations.

Further considerations are summarised in Table 7-5.

|                                          |                                                                                                                                                                                                                                                                                   |
|------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Flood Risk / Sustainable Drainage</b> | As the site is in Flood Risk Zone 3 a Flood Risk Assessment (FRA) is required.<br>NPPF <sup>16</sup> requires that an FRA is undertaken to assess the impact of the site on the local drainage system and to assess potential for Sustainable Drainage Systems (SuDS) techniques. |
| <b>Waste Characterisation</b>            | As part of earthworks, the classification of the soils will be required to determine the most appropriate waste disposal route.                                                                                                                                                   |

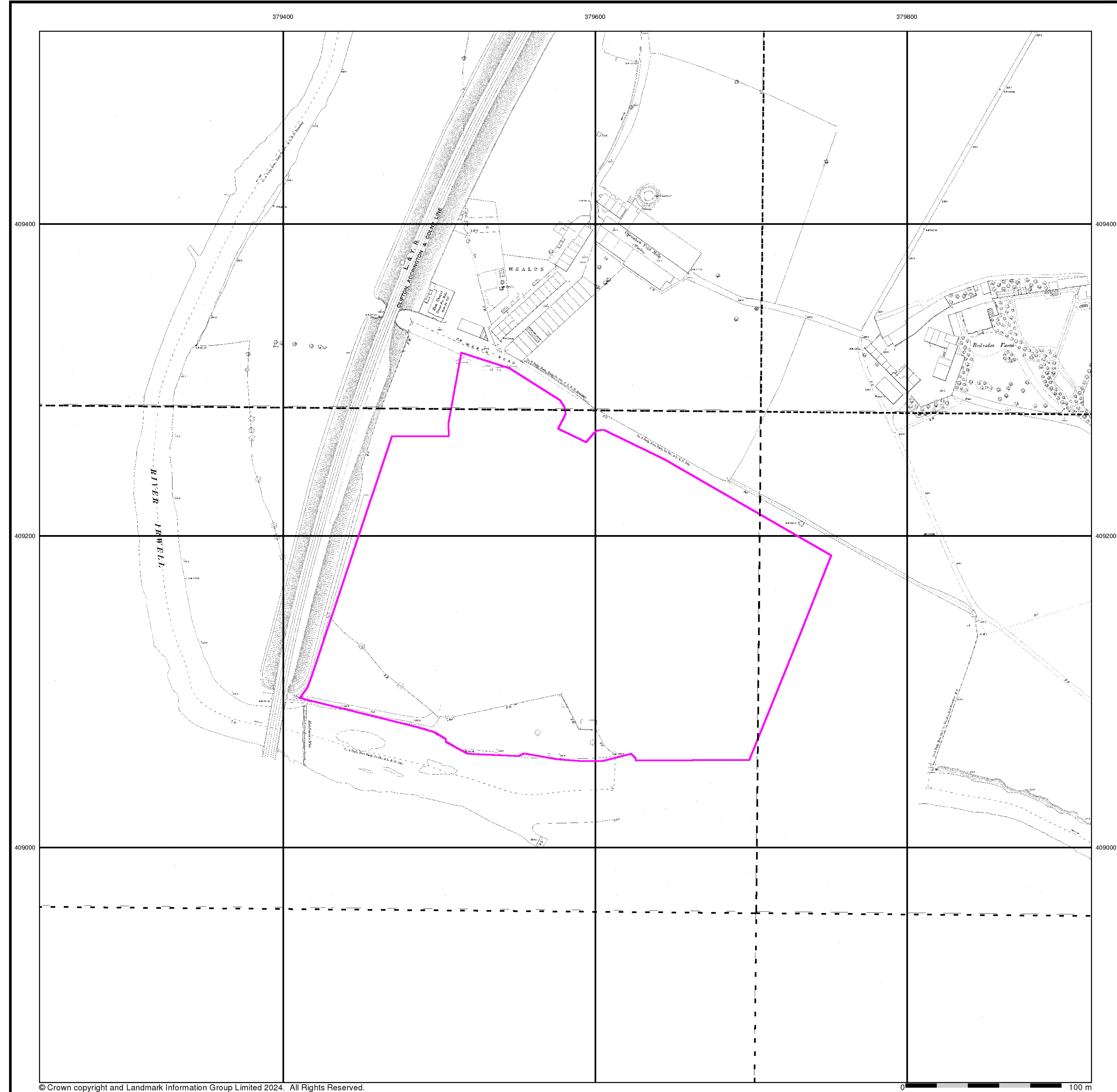
Table 7-7: Further considerations.

## Figures



|                                             |                 |                   |                     |                                                          |           |                                                                                       |
|---------------------------------------------|-----------------|-------------------|---------------------|----------------------------------------------------------|-----------|---------------------------------------------------------------------------------------|
| Client:<br><br>GFIC Properties Ltd          |                 |                   |                     | Title:<br><br>Site Location &<br>Boundary Plan           |           |  |
| Site:<br><br>Warth Business Park, Radcliffe |                 |                   |                     | Scale (see scale bar):<br><br>1:25,000 &<br>1:2,500 @ A4 |           |                                                                                       |
| Job No.:<br>LKC241231                       | Drawn By:<br>EH | Checked By:<br>CC | Drawn:<br>July 2024 | Figure:<br><br>1                                         | Revision: |                                                                                       |

## Appendix A – Historical Maps



**LK**  
**GROUP**  
**Lancashire And Furness**  
**Published 1891**  
**Source map scale - 1:500**

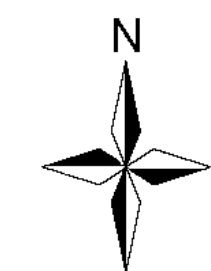
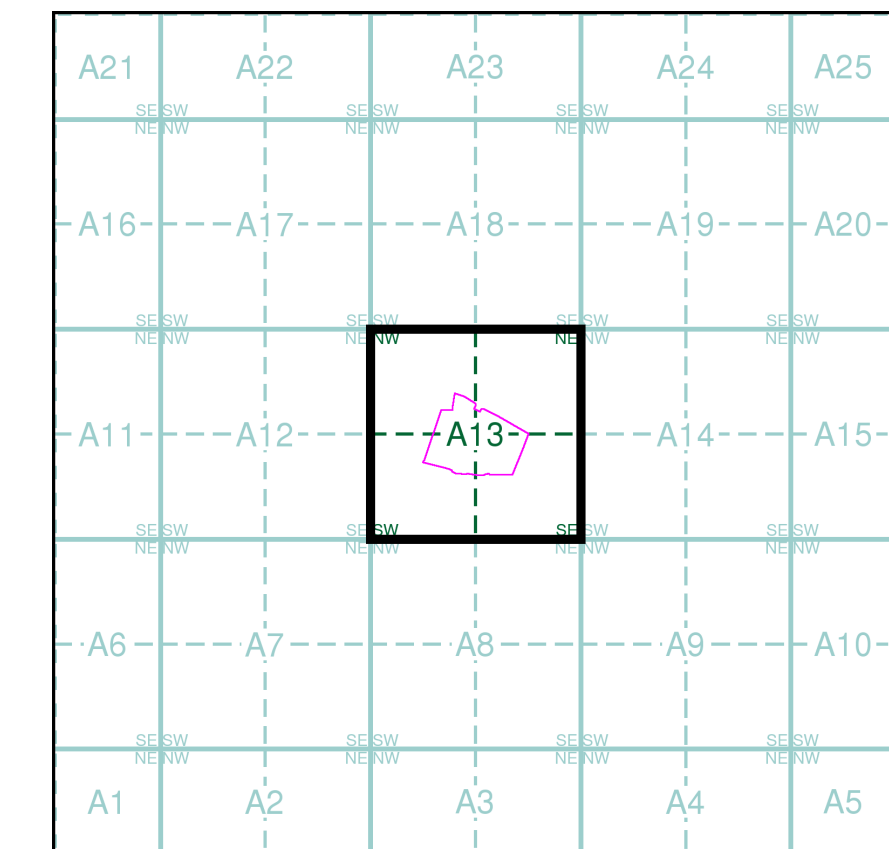
The 1:500 scale Ordnance Survey mapping was introduced in 1855 as a replacement for the 1:528 scale and to compliment the 1:2500 scale that had been implemented in 1853. By 1895, the 1:500 scale covered most towns over a population of about 4000 at the time of survey, although very few towns were mapped more than once at this scale, and none have been since 1910. The 1:500 scale gives particular emphasis to such features as lamp posts, man holes, arched passages and minor building projections. Also often featured are divisions between tenements, interior ground floor layouts of public buildings, and on earlier plans, the functions of the various parts of larger industrial premises are also indicated. Content of the plans does vary however, from one town to the next in terms of, for example, the completeness of railway tracks and the coverage of public buildings.

Please note: Due to the partial coverage of Historical Town Plans, it is possible that not all segments within an order will contain mapping. Only the segments that have Town Plan coverage will be generated.

**Map Name(s) and Date(s)**

|            |            |
|------------|------------|
| 087_16_005 | 088_13_001 |
| 1891       | 1891       |
| 1:500      | 1:500      |
| 087_16_010 | 088_13_006 |
| 1891       | 1891       |
| 1:500      | 1:500      |
|            | 088_13_011 |
|            | 1891       |
|            | 1:500      |

**Historical Town Plan - Segment A13**

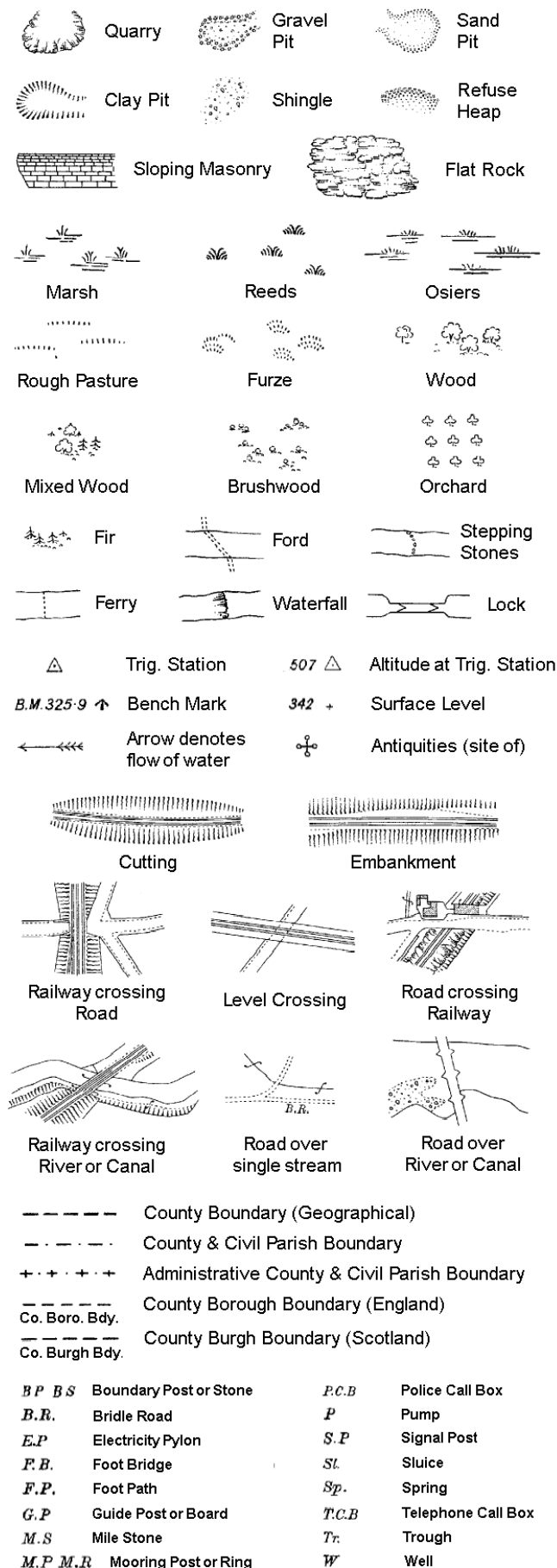


**Order Details**  
Order Number: 350314821\_1\_1  
Customer Ref: LKC 24 1231  
National Grid Reference: 379580, 409170  
Slice: A  
Site Area (Ha): 5.71  
Search Buffer (m): 0

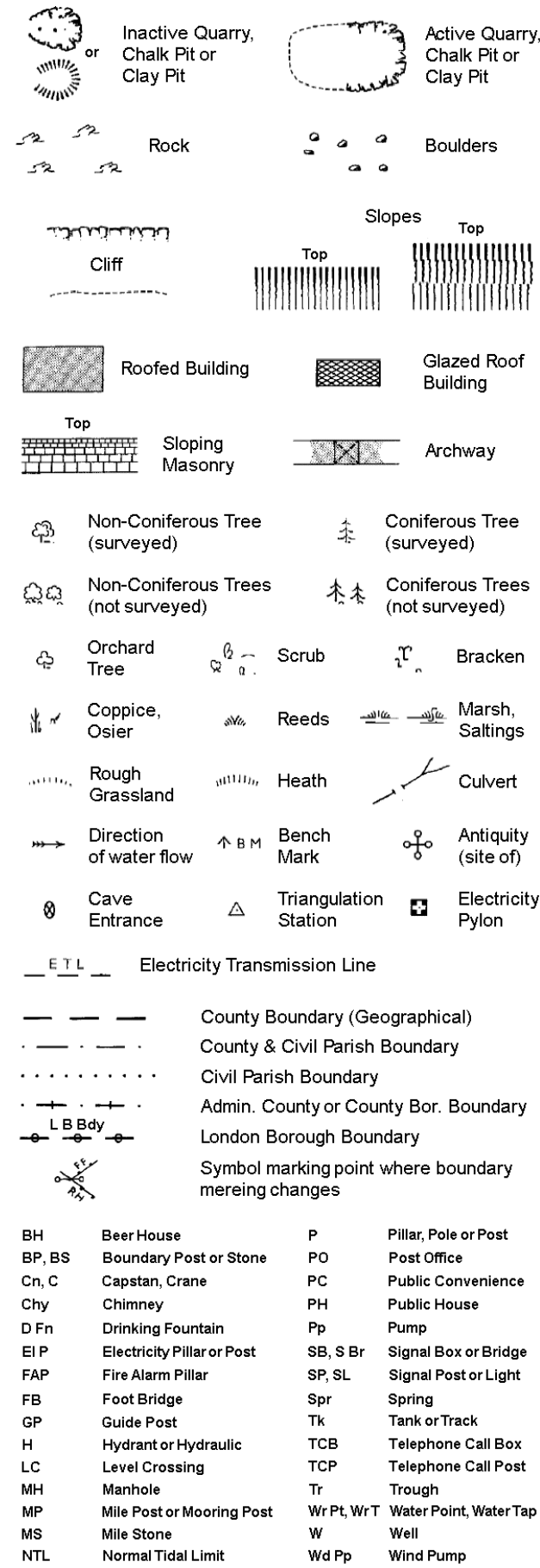
**Site Details**  
Site at 379580, 409190

# Historical Mapping Legends

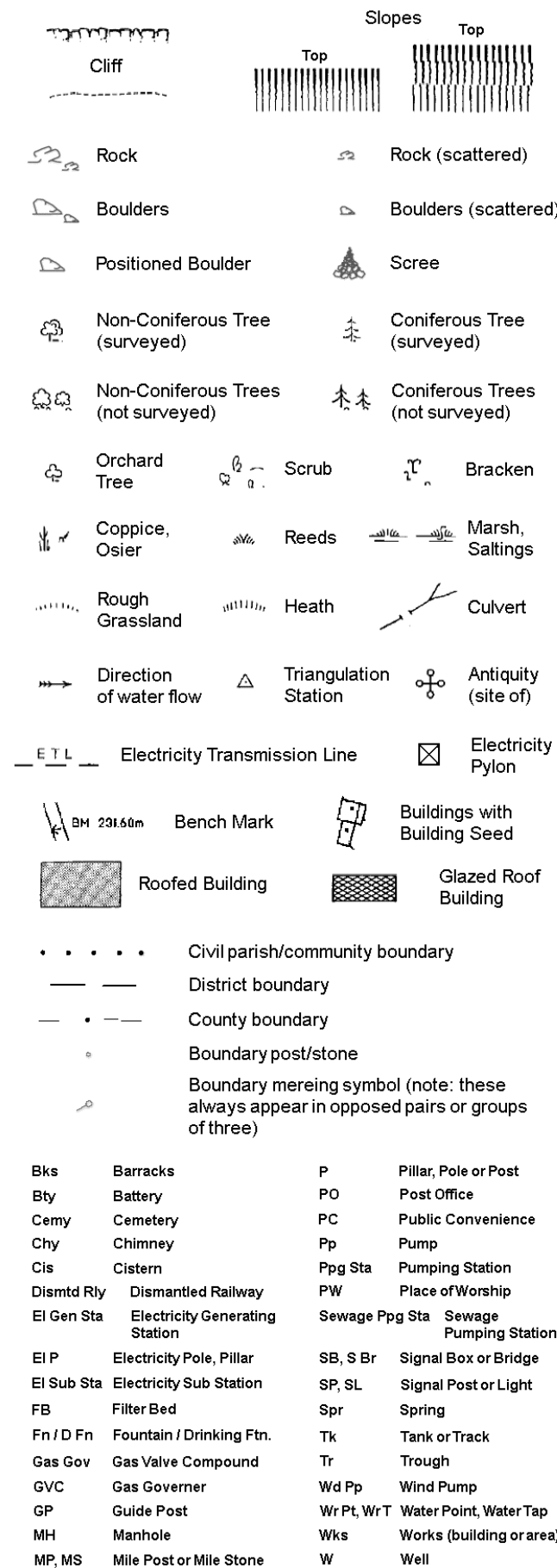
## Ordnance Survey County Series and Ordnance Survey Plan 1:2,500



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



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

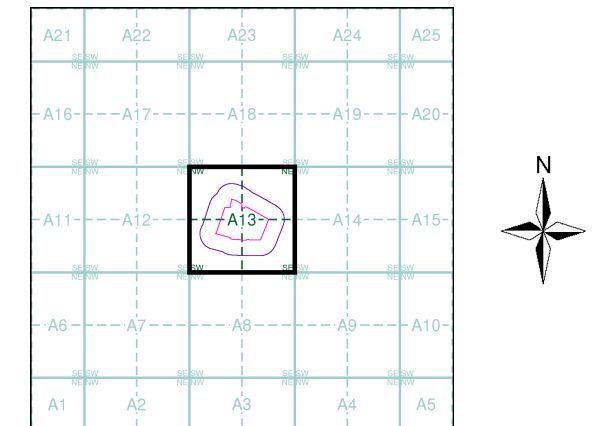


GROUP

Historical Mapping & Photography included:

| Mapping Type                   | Scale   | Date        | Pg |
|--------------------------------|---------|-------------|----|
| Lancashire And Furness         | 1:2,500 | 1889 - 1893 | 2  |
| Lancashire And Furness         | 1:2,500 | 1910        | 3  |
| Lancashire And Furness         | 1:2,500 | 1930        | 4  |
| Lancashire And Furness         | 1:2,500 | 1937        | 5  |
| Ordnance Survey Plan           | 1:1,250 | 1956 - 1957 | 6  |
| Additional SIMs                | 1:1,250 | 1956 - 1987 | 7  |
| Ordnance Survey Plan           | 1:2,500 | 1957        | 8  |
| Ordnance Survey Plan           | 1:1,250 | 1964 - 1976 | 9  |
| Additional SIMs                | 1:1,250 | 1964 - 1987 | 10 |
| Ordnance Survey Plan           | 1:2,500 | 1970        | 11 |
| Additional SIMs                | 1:1,250 | 1987        | 12 |
| Ordnance Survey Plan           | 1:1,250 | 1989        | 13 |
| Large-Scale National Grid Data | 1:1,250 | 1992        | 14 |
| Additional SIMs                | 1:1,250 | 1992        | 15 |
| Historical Aerial Photography  | 1:2,500 | 2001        | 16 |

## Historical Map - Segment A13



## Order Details

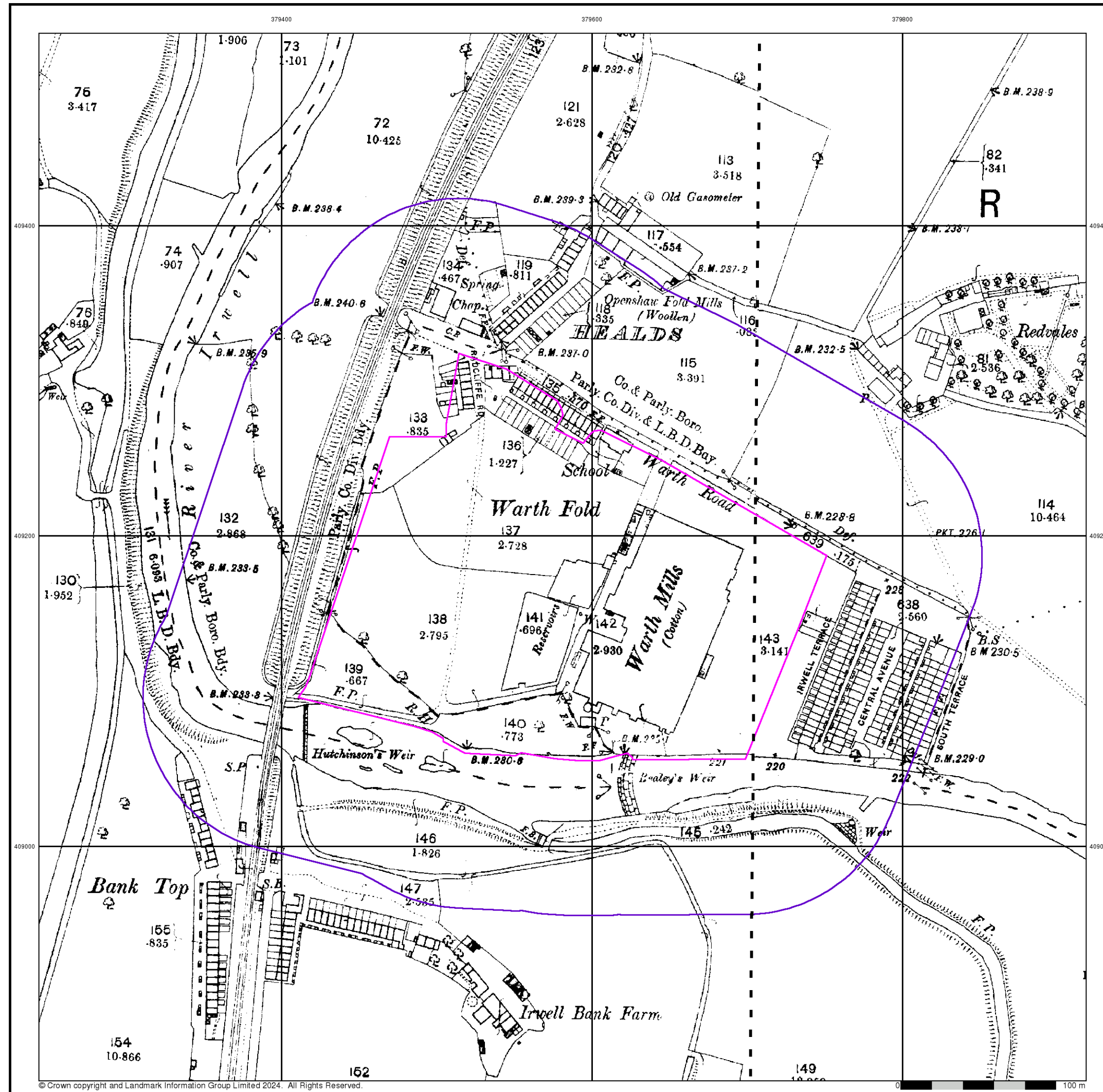
Order Number: 350314821\_1\_1  
Customer Ref: LKC 24 1231  
National Grid Reference: 379580, 409170  
Slice: A  
Site Area (Ha): 5.71  
Search Buffer (m): 100

## Site Details

Site at 379580, 409190



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



© Crown copyright and Landmark Information Group Limited 2024. All Rights Reserved.

# LK GROUP

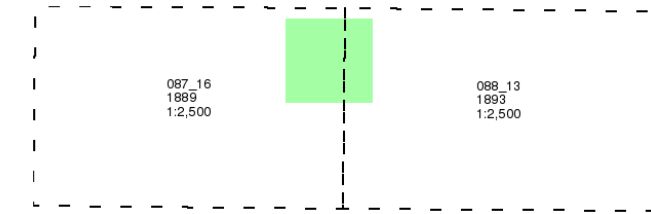
## Lancashire And Furness

Published 1889 - 1893

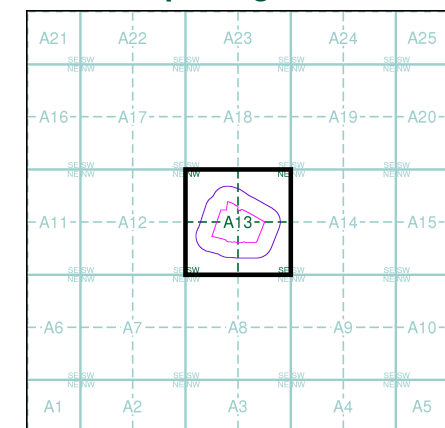
Source map scale - 1:2,500

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

### Map Name(s) and Date(s)



### Historical Map - Segment A13



### Order Details

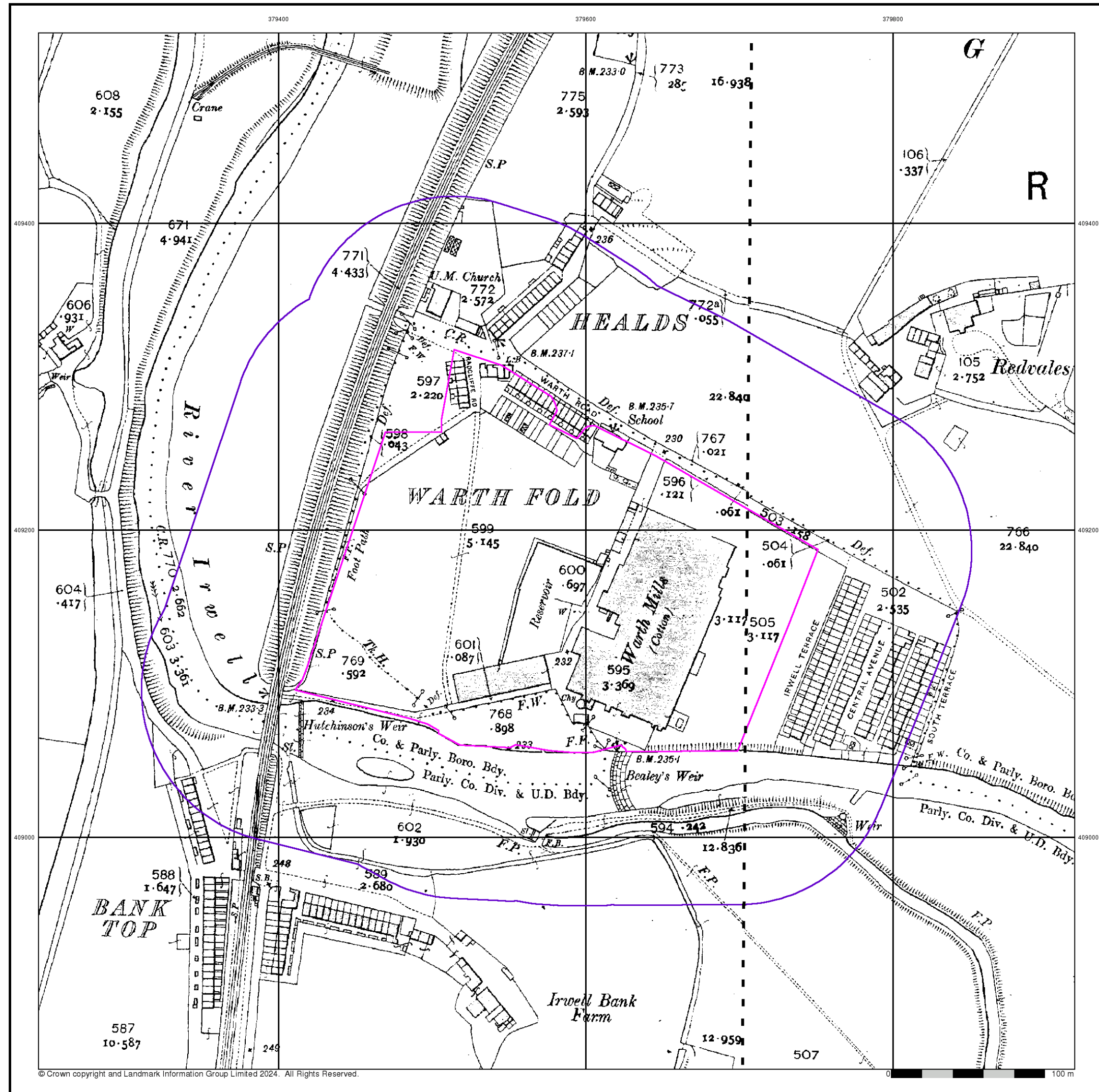
Order Number: 350314821\_1\_1  
Customer Ref: LKC 24 1231  
National Grid Reference: 379580, 409170  
Slice: A  
Site Area (Ha): 5.71  
Search Buffer (m): 100

### Site Details

Site at 379580, 409190



Tel: 0844 844 9952  
Fax: 0844 844 9951  
Web: [www.envirocheck.co.uk](http://www.envirocheck.co.uk)



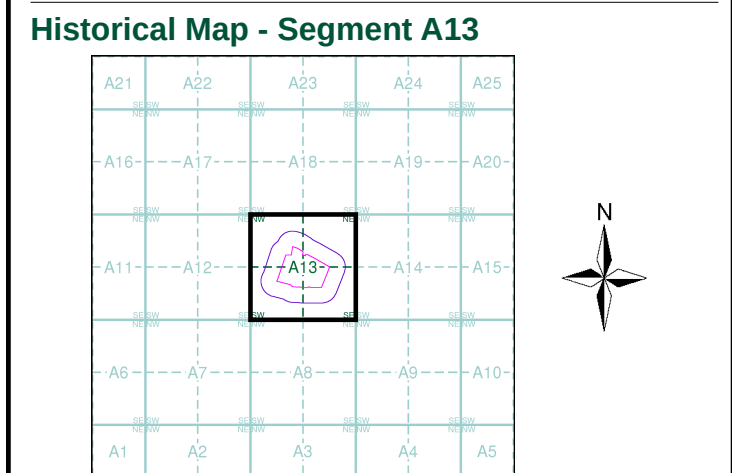
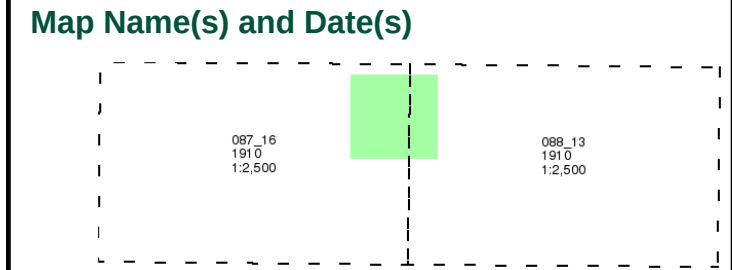
# LK GROUP

## Lancashire And Furness

Published 1910

Source map scale - 1:2,500

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

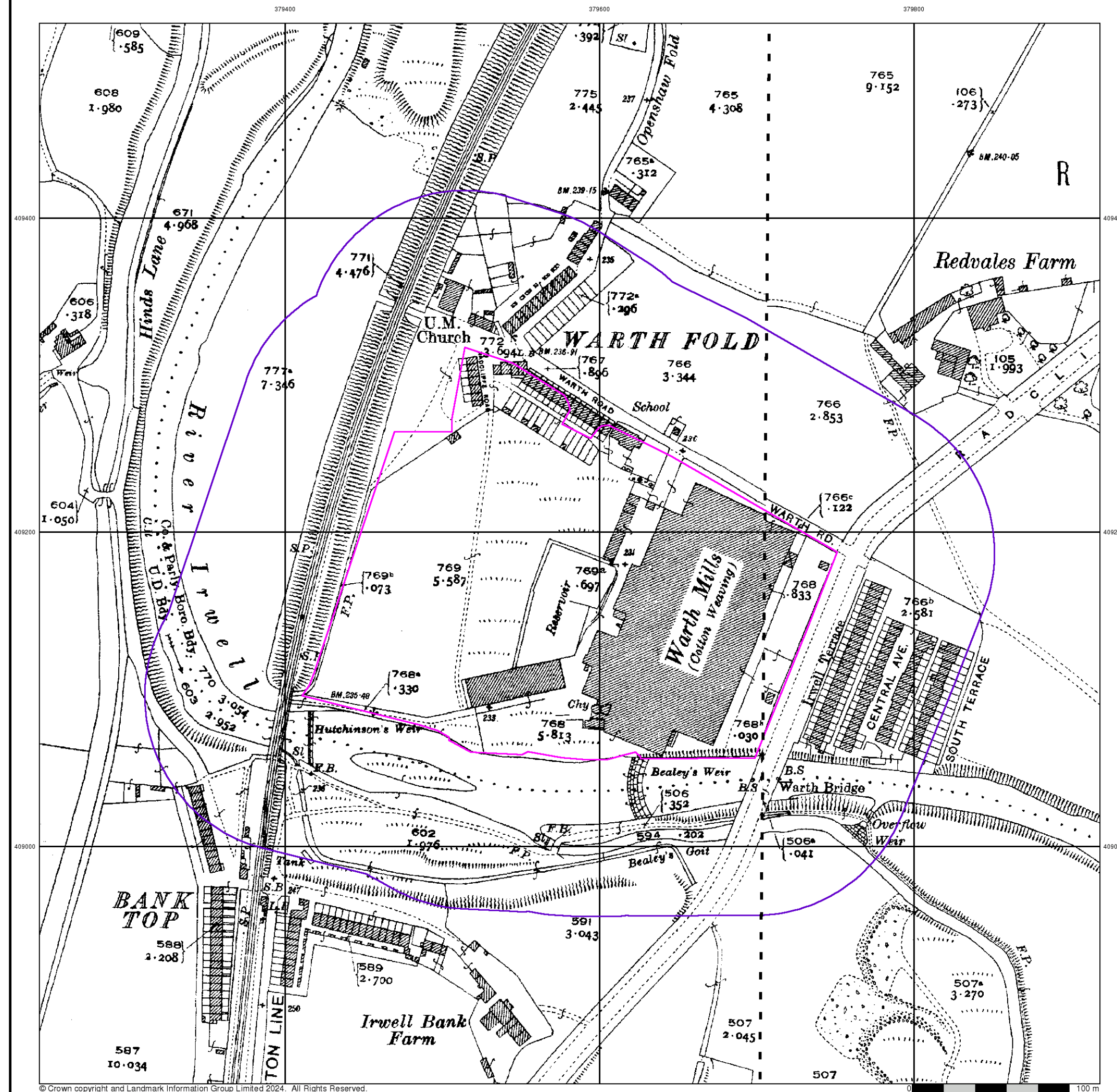


### Order Details

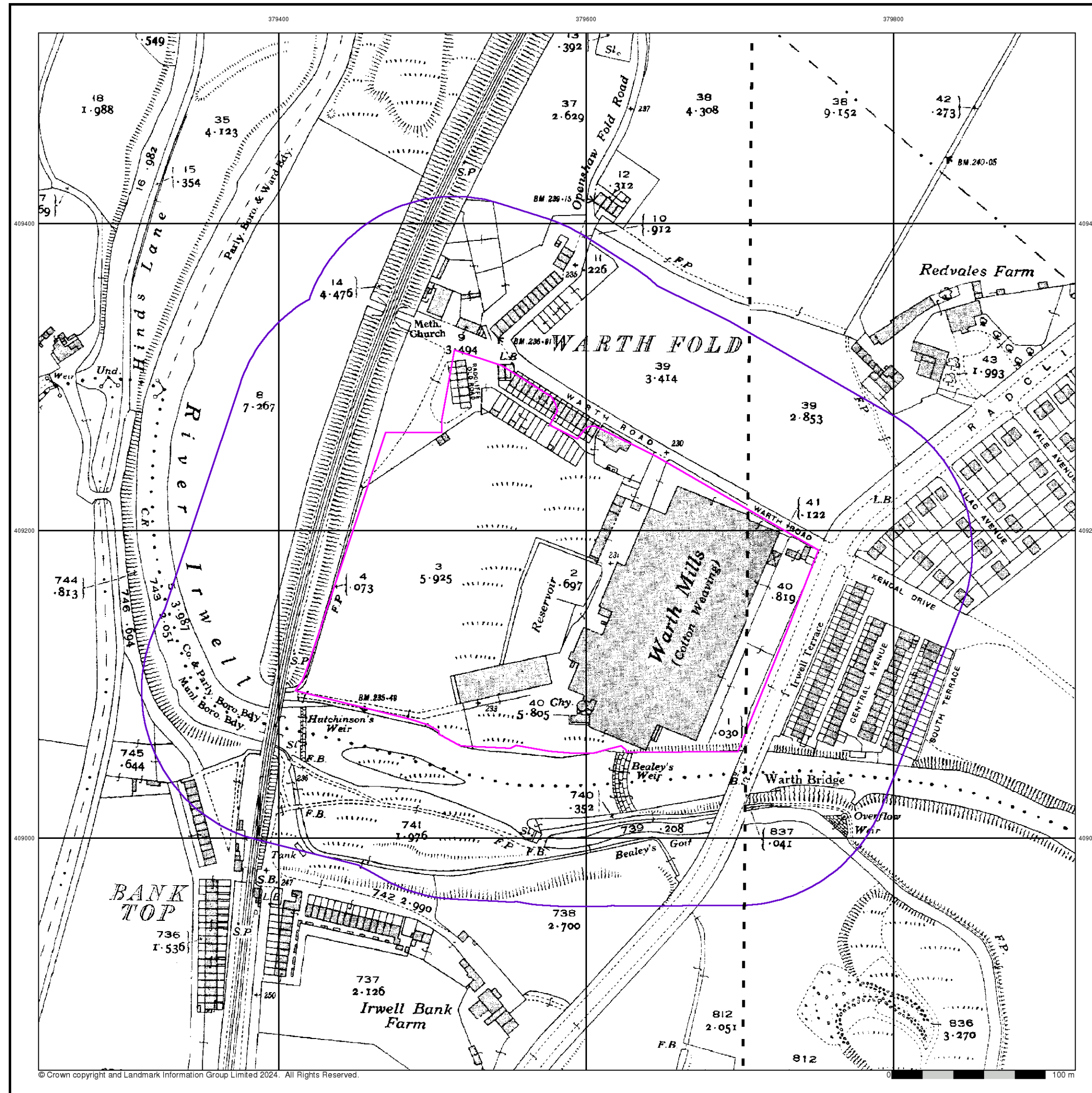
|                          |                |
|--------------------------|----------------|
| Order Number:            | 350314821_1_1  |
| Customer Ref:            | LKC 24 1231    |
| National Grid Reference: | 379580, 409170 |
| Slice:                   | A              |
| Site Area (Ha):          | 5.71           |
| Search Buffer (m):       | 100            |

### Site Details

|                        |
|------------------------|
| Site at 379580, 409190 |
|------------------------|



**LK**  
GROUP  
Lancashire And Furness



# LK GROUP

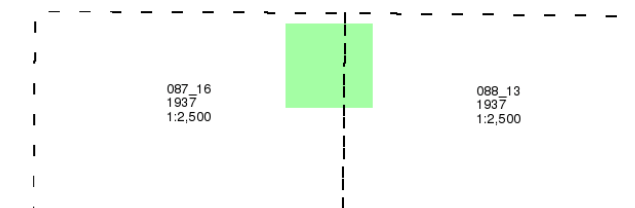
## Lancashire And Furness

### Published 1937

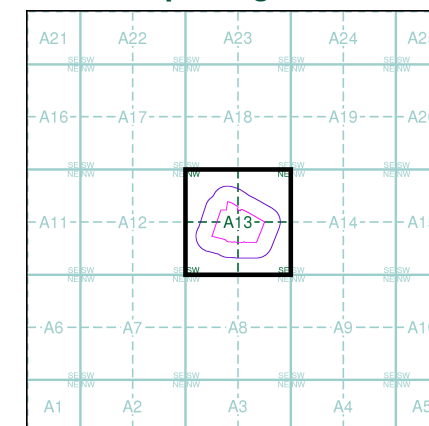
#### Source map scale - 1:2,500

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

#### Map Name(s) and Date(s)



#### Historical Map - Segment A13



#### Order Details

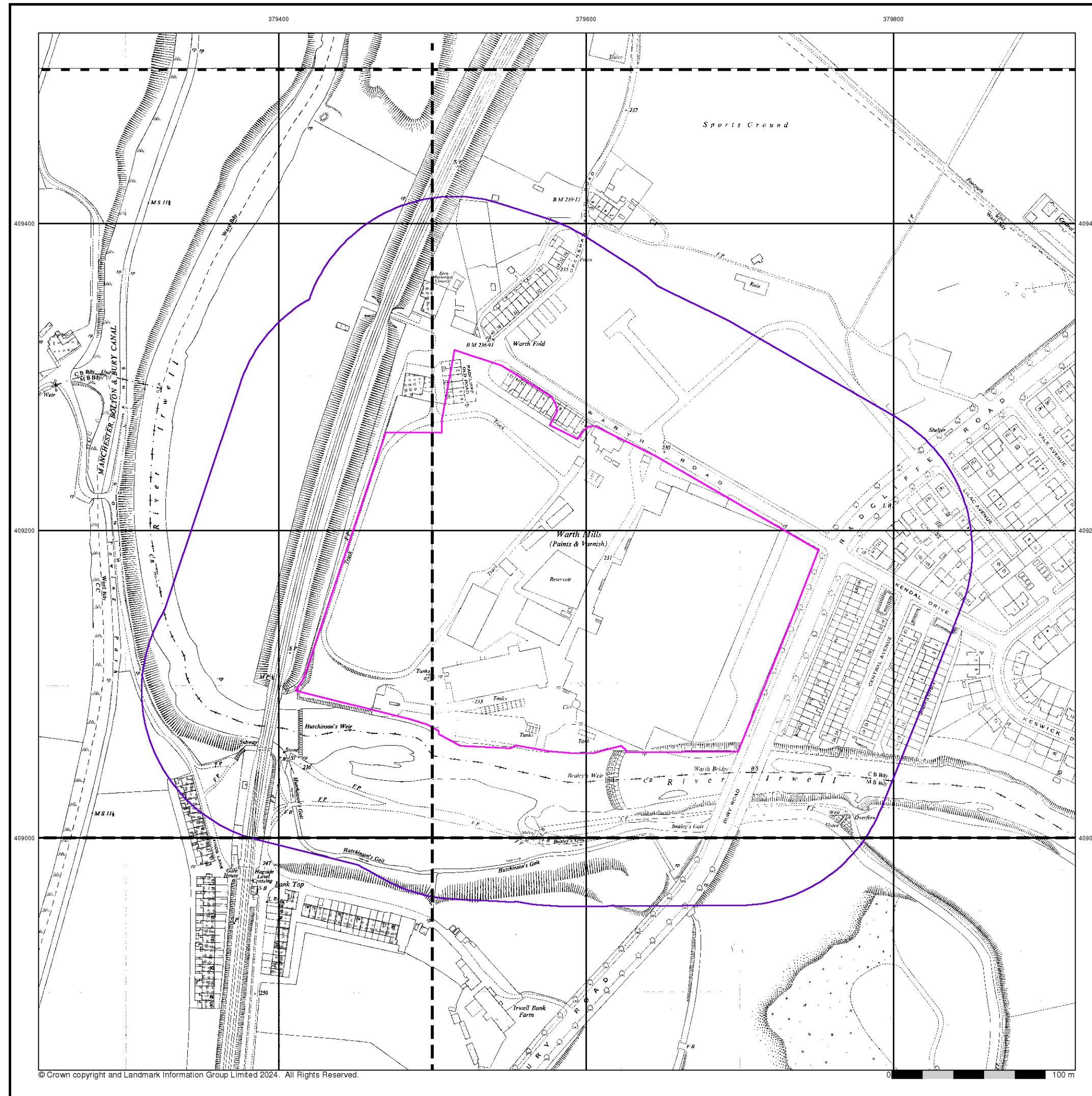
Order Number: 350314821\_1\_1  
Customer Ref: LKC 24 1231  
National Grid Reference: 379580, 409170  
Slice: A  
Site Area (Ha): 5.71  
Search Buffer (m): 100

#### Site Details

Site at 379580, 409190

**Landmark**  
INFORMATION GROUP

Tel: 0844 844 9952  
Fax: 0844 844 9951  
Web: [www.envirocheck.co.uk](http://www.envirocheck.co.uk)



© Crown copyright and Landmark Information Group Limited 2024. All Rights Reserved.



GROUP

Ordnance Survey Plan

Published 1956 - 1957

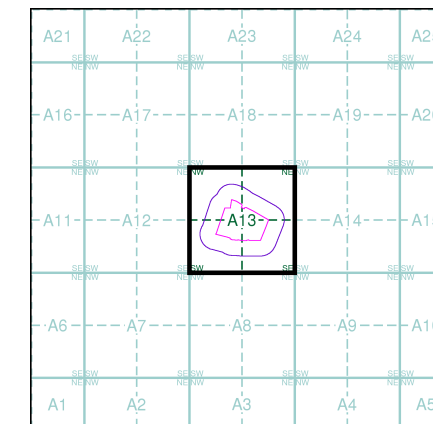
Source map scale - 1:1,250

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

### Map Name(s) and Date(s)

|          |          |
|----------|----------|
| SD7909NE | SD7909NE |
| 1957     | 1957     |
| 1:1,250  | 1:1,250  |
| SD7909SE | SD7909SE |
| 1957     | 1957     |
| 1:1,250  | 1:1,250  |
| SD7908NE | SD7908NE |
| 1956     | 1956     |
| 1:1,250  | 1:1,250  |

### Historical Map - Segment A13



### Order Details

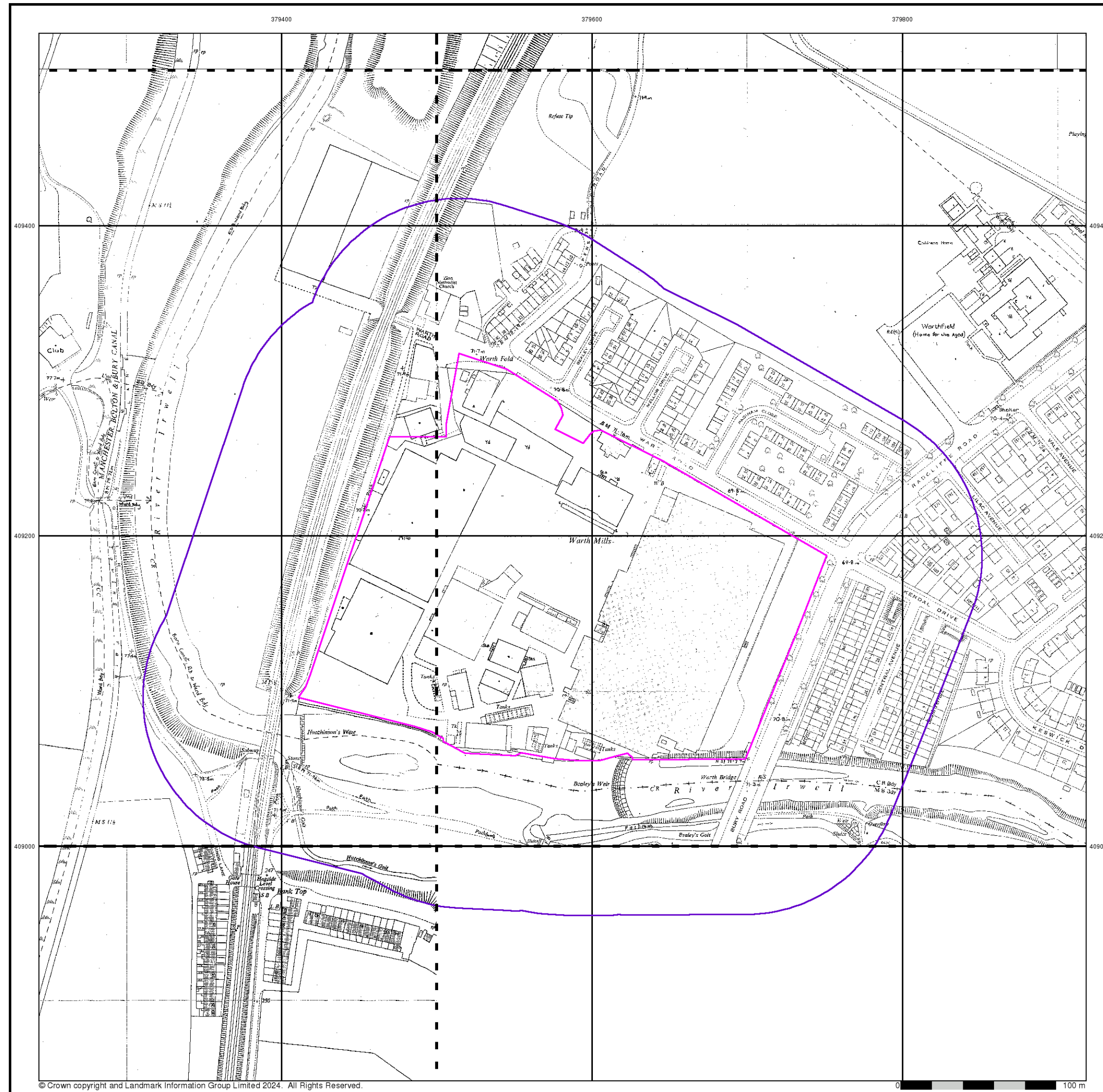
Order Number: 350314821\_1\_1  
Customer Ref: LKC 24 1231  
National Grid Reference: 379580, 409170  
Slice: A  
Site Area (Ha): 5.71  
Search Buffer (m): 100

### Site Details

Site at 379580, 409190



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



© Crown copyright and Landmark Information Group Limited 2024. All Rights Reserved.



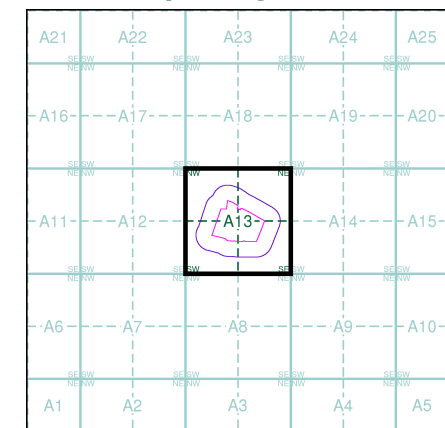
**Published 1956 - 1987**  
**Source map scale - 1:1,250**

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

**Map Name(s) and Date(s)**

|          |          |
|----------|----------|
| ID7909NW | ID7909NE |
| 957      | 1987     |
| 1:1,250  | 1:1,250  |
| ID7909SW | ID7909SE |
| 984      | 1977     |
| 1:1,250  | 1:1,250  |
| ID7908NW |          |
| 956      |          |
| 1:1,250  |          |

**Historical Map - Segment A13**



**Order Details**

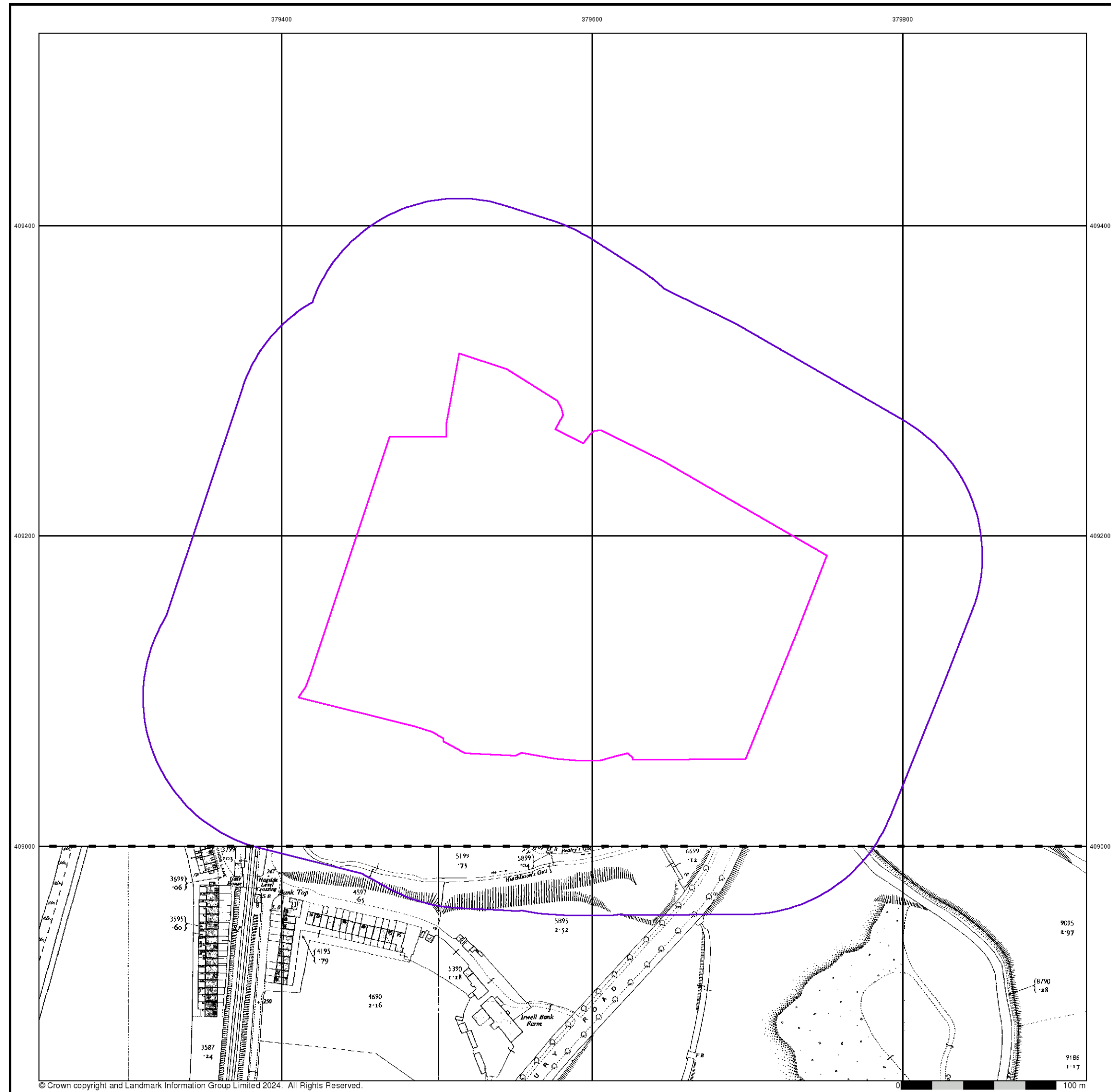
Order Number: 350314821\_1\_1  
Customer Ref: LKC 24 1231  
National Grid Reference: 379580, 409170  
Slice: A  
Site Area (Ha): 5.71  
Search Buffer (m): 100

**Site Details**

Site at 379580, 409190



Tel: 0844 844 9952  
Fax: 0844 844 9951  
Web: [www.envirocheck.co.uk](http://www.envirocheck.co.uk)



© Crown copyright and Landmark Information Group Limited 2024. All Rights Reserved.

0 100 m



GROUP

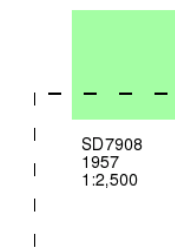
Ordnance Survey Plan

Published 1957

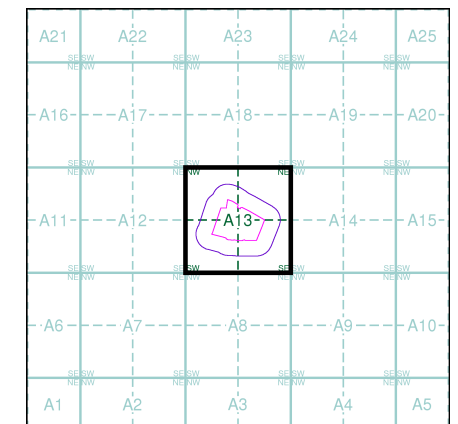
Source map scale - 1:2,500

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

### Map Name(s) and Date(s)



### Historical Map - Segment A13



### Order Details

Order Number: 350314821\_1\_1  
Customer Ref: LKC 24 1231  
National Grid Reference: 379580, 409170  
Slice: A  
Site Area (Ha): 5.71  
Search Buffer (m): 100

### Site Details

Site at 379580, 409190

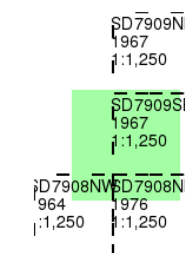


Tel: 0844 844 9952  
Fax: 0844 844 9951  
Web: www.envirocheck.co.uk

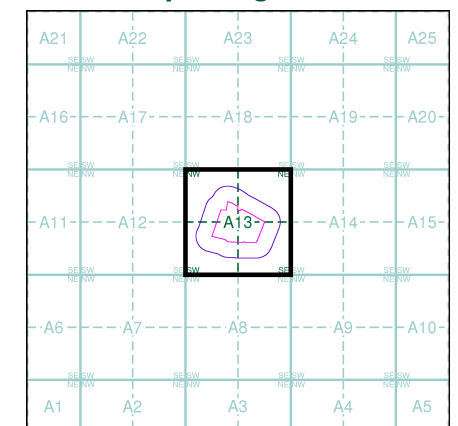


The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain.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

## Map Name(s) and Date(s)



## Historical Map - Segment A13



## Order Details

|                          |                |
|--------------------------|----------------|
| Order Number:            | 350314821_1_1  |
| Customer Ref:            | LKC 24 1231    |
| National Grid Reference: | 379580, 409170 |
| Slice:                   | A              |
| Site Area (Ha):          | 5.71           |
| Search Buffer (m):       | 100            |

## Site Details

Site at 379580, 409190

**Landmark®**  
INFORMATION GROUP

Tel: 0844 844 9952  
Fax: 0844 844 9951  
Web: [www.envirocheck.co.uk](http://www.envirocheck.co.uk)



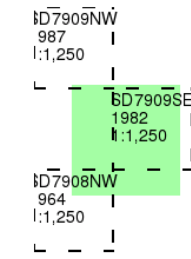
© Crown copyright and Landmark Information Group Limited 2024. All Rights Reserved.



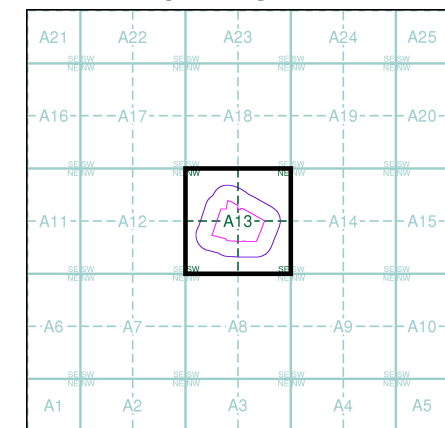
**Published 1964 - 1987**  
**Source map scale - 1:1,250**

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

**Map Name(s) and Date(s)**



**Historical Map - Segment A13**



**Order Details**

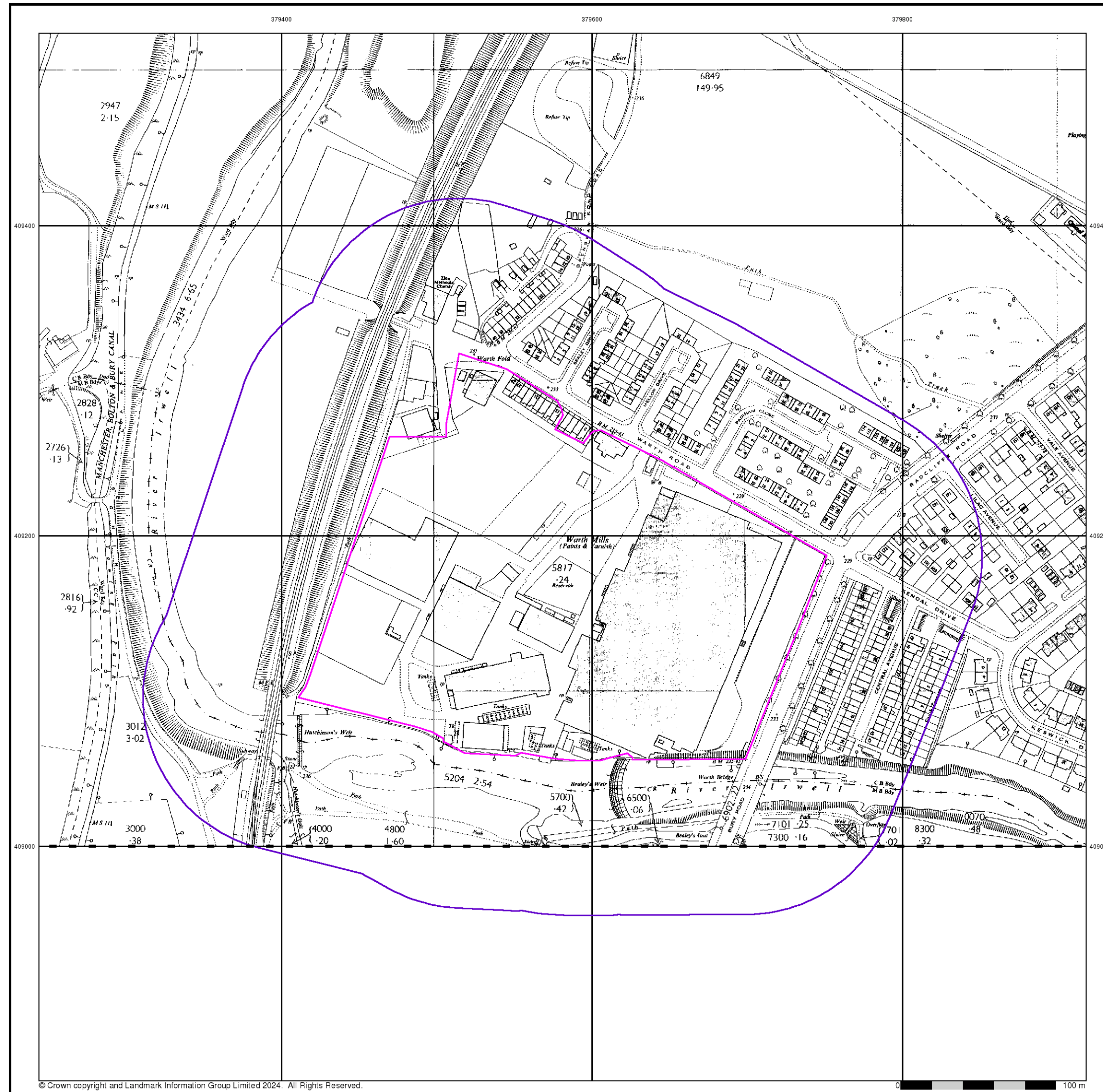
Order Number: 350314821\_1\_1  
Customer Ref: LKC 24 1231  
National Grid Reference: 379580, 409170  
Slice: A  
Site Area (Ha): 5.71  
Search Buffer (m): 100

**Site Details**

Site at 379580, 409190



Tel: 0844 844 9952  
Fax: 0844 844 9951  
Web: [www.envirocheck.co.uk](http://www.envirocheck.co.uk)



© Crown copyright and Landmark Information Group Limited 2024. All Rights Reserved.



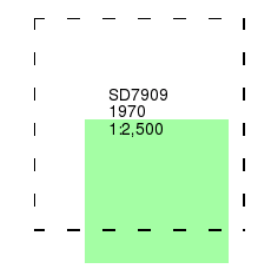
## Ordnance Survey Plan

Published 1970

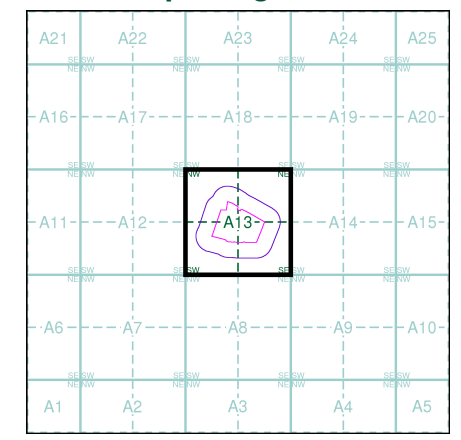
Source map scale - 1:2,500

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

### Map Name(s) and Date(s)



### Historical Map - Segment A13



### Order Details

Order Number: 350314821\_1\_1  
Customer Ref: LKC 24 1231  
National Grid Reference: 379580, 409170  
Slice: A  
Site Area (Ha): 5.71  
Search Buffer (m): 100

### Site Details

Site at 379580, 409190

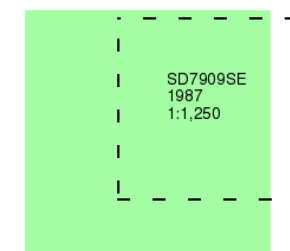


Tel: 0844 844 9952  
Fax: 0844 844 9951  
Web: www.envirocheck.co.uk

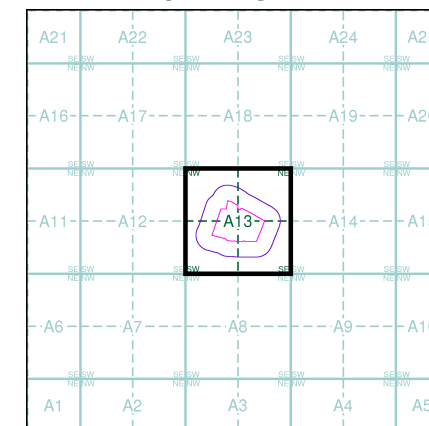


The SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') are further, minor editions of mapping which were produced and published in between the main editions as an area was updated. They date from 1947 to 1994, and contain detailed information on buildings, roads and land-use. These maps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

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

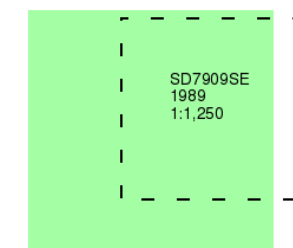
Order Number: 350314821\_1\_1  
Customer Ref: LKC 24 1231  
National Grid Reference: 379580, 409170  
Slice: A  
Site Area (Ha): 5.71  
Search Buffer (m): 100

Site Details

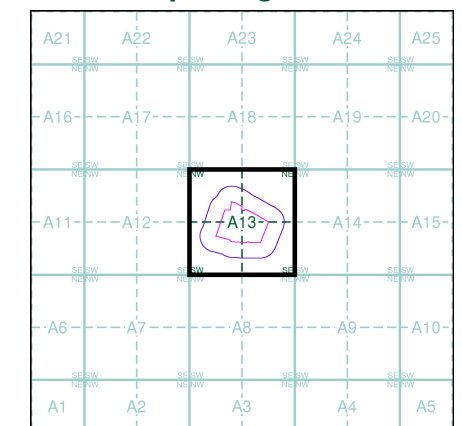
Site at 379580, 409190



Map Name(s) and Date(s)



## Historical Map - Segment A13



## Order Details

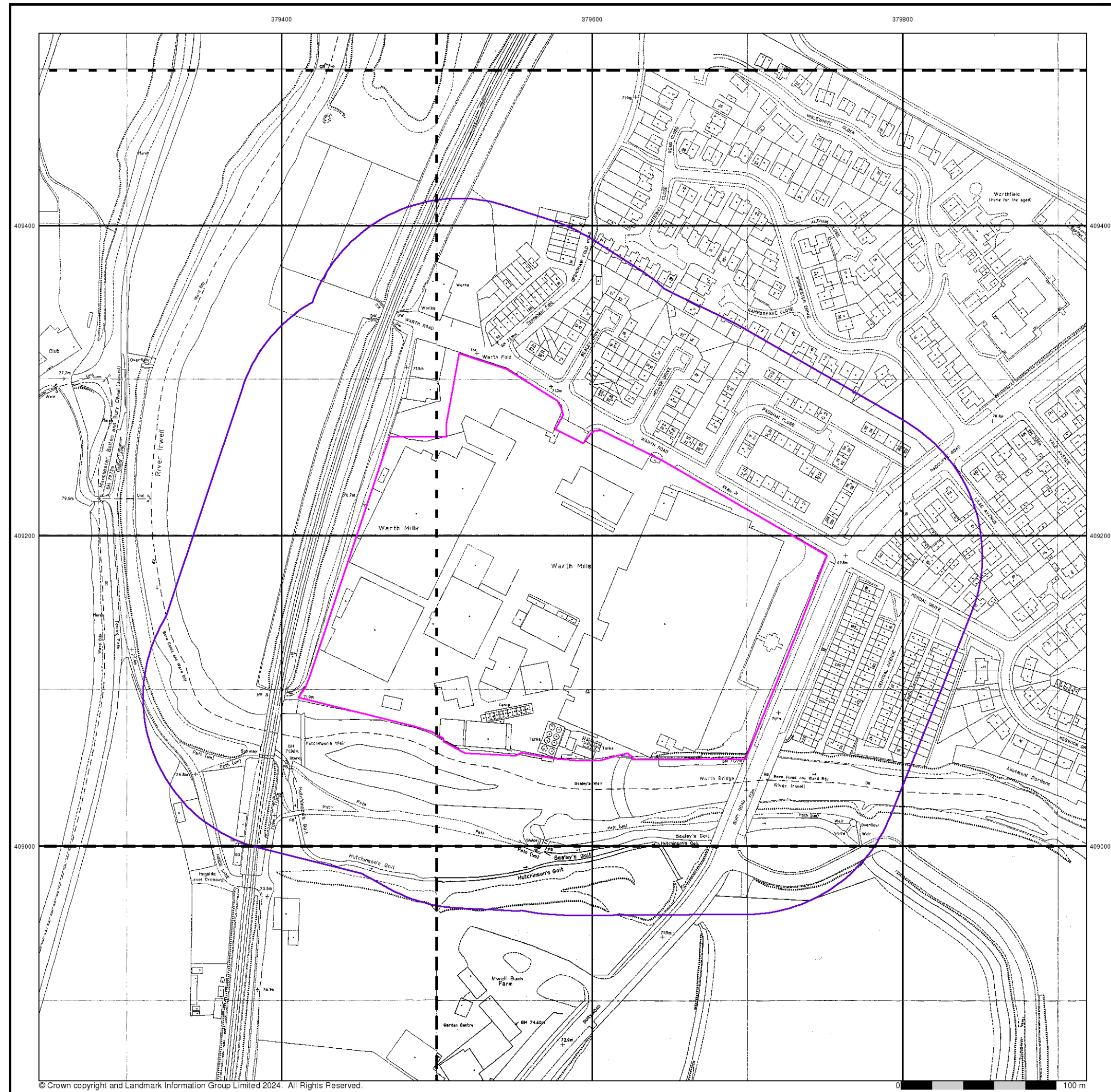
|                          |                |
|--------------------------|----------------|
| Order Number:            | 350314821_1_1  |
| Customer Ref:            | LKC 24 1231    |
| National Grid Reference: | 379580, 409170 |
| Slice:                   | A              |
| Site Area (Ha):          | 5.71           |
| Search Buffer (m):       | 100            |

## Site Details

Site at 379580, 409190

**Landmark®**  
INFORMATION GROUP

Tel: 0844 844 9952  
Fax: 0844 844 9951  
Web: [www.envirocheck.co.uk](http://www.envirocheck.co.uk)



LK

GROUP

Large-Scale National Grid Data

Published 1992

Source map scale - 1:1,250

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

Map Name(s) and Date(s)

ID7909NV

ID7909NE

992

1:1,250

ID7909SV

ID7909SE

992

1:1,250

ID7908NV

ID7908NE

992

1:1,250

Historical Map - Segment A13

A21

A22

A23

A24

A25

A16

A17

A18

A19

A20

A11

A12

A13

A14

A15

A6

A7

A8

A9

A10

A1

A2

A3

A4

A5

N

Order Details

Order Number:

350314821\_1\_1

Customer Ref:

LKC 24 1231

National Grid Reference:

379580, 409170

Slice:

A

Site Area (Ha):

5.71

Search Buffer (m):

100

Site Details

Site at 379580, 409190

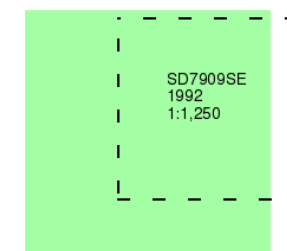


Published 1992

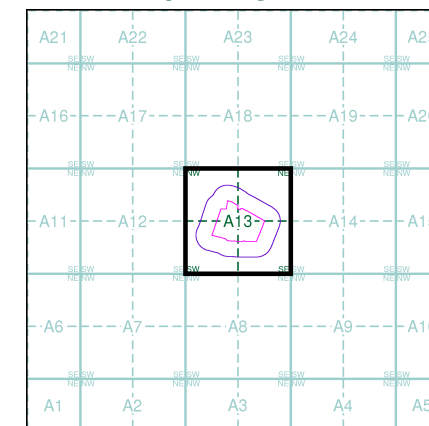
Source map scale - 1:1,250

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

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

Order Number: 350314821\_1\_1  
Customer Ref: LKC 24 1231  
National Grid Reference: 379580, 409170  
Slice: A  
Site Area (Ha): 5.71  
Search Buffer (m): 100

Site Details

Site at 379580, 409190