



# Swadlincote Resource & Recovery Park (SRRP)

## Desk Study

*R&P Clean Power Ltd*

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# CONTENTS

1.	INTRODUCTION.....	1
2.	PHASE 1 STUDY (DESK STUDY AND FIELD RECONNAISSANCE).....	3
3.	OUTLINE CONCEPTUAL SITE MODEL.....	1
4.	DESK STUDY CONCLUSIONS.....	4
5.	UNCERTAINTIES AND LIMITATIONS.....	1
6.	RECOMMENDATIONS FOR FURTHER WORK.....	2
7.	REFERENCES.....	4

## Appendices

Appendix A	Drawings
Appendix B	Field Reconnaissance Photographs
Appendix C	Historical Ordnance Survey Maps
Appendix D	Desk Study Research Information
Appendix E	Preliminary Geotechnical Risk Register
Appendix F	Plausible Source-Pathway-Receptor Contaminant Linkages
Appendix G	Hydrock Methodologies

## Tables

Table 2.1: Site referencing information .....	3
Table 2.2: Site description.....	5
Table 2.3: Site history review.....	7
Table 2.4: Geology.....	7
Table 2.5: Aquifer system.....	9
Table 2.6: Surface water features.....	11
Table 2.7: Surface water discharges.....	11
Table 2.8: Mining, mineral extraction and ground works.....	12
Table 2.9: Waste management sites.....	15
Table 2.10: Natural soil chemistry.....	16
Table 4.1: Possible Pollutant Linkages (for risk levels of moderate or greater) .....	4

## Figures

Figure 2.1: Site location .....	3
Figure 2.2: Extract from the Ordnance Survey Map.....	3
Figure 2.3: Site location plan extract (provided in Appendix A).....	4
Figure 2.4: Site description of ARF and ERF areas (taken from previous red line boundary).....	4
Figure 2.5: Area covered by the field reconnaissance survey prior to site changes.....	5
Figure 2.6: Entrance to adjacent site and access road to the proposed development.....	6



Figure 2.7: Culvert and waterway .....	6
Figure 2.8: Track to the north of the site .....	6
Figure 2.9: Electricity cables through the northwest of the site buried with what looks to be Made Ground .....	6
Figure 2.10: Superficial deposits. ....	8
Figure 2.11: Solid geology. ....	8
Figure 2.12: Borehole location plan for previous ground investigation .....	9
Figure 2.13: Groundwater abstraction zones.....	10
Figure 2.14: Groundwater vulnerability .....	10
Figure 2.15: Flood zones .....	12
Figure 2.16: River and Coastl flooding .....	12
Figure 2.17: Coal Authority Site Plot (high risk to the east of Willshees WRF).....	14
Figure 2.18: Coal Mining Risk Assessment for proposed Weighbridge and Office.....	14

## EXECUTIVE SUMMARY

<i>SITE INFORMATION AND SETTING</i>	
Objectives	Phase 1 Desk Study to support the planning application.
Client	R&P Clean Power Ltd
Site name and location	Willshee's, Depot 3, Keith Willshee Way, Swadlincote, Derbyshire, DE11 9EL.
Proposed development	An integrated Resource Recovery Park comprising an Energy Recovery Facility (ERF) and Aggregate Recycling Facility (ARF), including grid connection works. Known as the Swadlincote Resource Recovery Park (SRRP).
<i>PHASE 1 (DESK STUDY AND SITE RECONNIASANCE)</i>	
Ground Model	<p>The assessment site (ERF and ARF area) is an irregular rectangle in shape and has a main area of approximately 5.4 ha. The site lies immediately west of the existing Willshees Materials Recycling Facility (MRF) and consists of woodland and the existing access road to the east and south totalling approximately 9.2ha. The river Darklands Brook runs to the west of the site and is culverted to the east. The topography of the site, is generally level, falling gently to the west and is typically 62m above Ordnance Datum (AOD).</p> <p>Review of historical Ordnance Survey mapping indicates:</p> <ul style="list-style-type: none"> <li>• The site was woodlands with a train line to the north from the beginning of records in the early 1880s;</li> <li>• In 1955, a sewage treatment plant was introduced to the north of the site, beyond the train line and some fields (this remains in situ);</li> <li>• In 1970, a canal is built adjacent to the site to the east;</li> <li>• In 1976, farmland to the east of the site is redeveloped into an industrial estate.</li> </ul> <p>A non-specialist UXO assessment indicates a low bomb risk.</p> <p>The geology of the site consists of superficial deposits of Alluvium and Head deposits over bedrock comprising mudstone from the Helsby and Chester Formation and Sandstone and conglomerates from the Chester Formation.</p> <p>The superficial deposits comprise a Secondary A aquifer and the bedrock is a Principal Aquifer. The site is not within a Source Protection Zone and there are no groundwater abstractions within 1km of the site.</p> <p>The Environmental report indicates that concentrations of cadmium above the Generic Assessment Criteria (GAC) may be naturally occurring at the site.</p>
<i>ASSESSMENT AND CONCLUSIONS</i>	
Preliminary Geotechnical Hazards	<p>The following plausible geotechnical risks are identified.</p> <ul style="list-style-type: none"> <li>• Soft / loose compressible ground (low strength and high settlement potential).</li> <li>• Shrinkage / swelling of the clay fraction of soils under the influence of vegetation.</li> <li>• Changing groundwater conditions.</li> <li>• Potential for unforeseen ground conditions and the risks associated with limited data.</li> </ul>
Preliminary Geo-environmental Conclusions	<p>Based on historical land uses and its current operational use, the overall risk from land contamination at the site is considered to be low for the current existing development, and moderate (with some specific high risks) identified for a redeveloped site in its current condition, but would need to be confirmed by appropriate intrusive investigation, testing and assessment. However, this is likely to be mitigation or remediation of localised hotspots and can be investigated and assessed post consent as part of a planning condition.</p> <p>It is considered that it is unlikely that the site would be classified as Contaminated Land under Part 2A of the EPA 1990.</p>



The possible pollutant linkages on an unremediated site determined by desk study and walk-over are summarised below. However, this is prior to any further investigation which will likely confirm localised hotspots for assessment and potential mitigation or remediation.

Source(s)	◀ potential Impact on ▶	Receptor(s)
Potential contamination linked to the Wastewater works to the north of the site and the works adjacent to the site		Site users Neighbours Ecosystems Groundwater Buildings
Ground gases (carbon dioxide and methane) from organic materials below the site, likely superficial deposits.		
Made Ground, associated with the burial of electricity cables in the west of the site and any works associated with the rail yard and track to the north, possibly including elevated concentrations of metals, metalloids, asbestos fibres, asbestos containing materials (ACM), polycyclic aromatic hydrocarbons (PAH) and petroleum hydrocarbons		

#### *FUTURE CONSIDERATIONS*

Further work	<p>In order to confirm the actual risks to receptors and confirm the ground conditions with respect to potential geotechnical and geo-environmental risks, an appropriate intrusive investigation will need to be undertaken following the grant of planning consent. This investigation will need to:</p> <ul style="list-style-type: none"> <li>• determine the soil strength/density profile beneath the main ERF and ARF site area;</li> <li>• determine the depth/level of groundwater beneath the main ERF and ARF site area;</li> <li>• determine the ground gas concentrations beneath the site;</li> <li>• assess trench stability, over break potential and ‘diggability’;</li> <li>• allow sampling for chemical and geotechnical laboratory testing;</li> <li>• allow soil classification to allow geotechnical characterisation and determine suitability for reuse of soils within earthworks;</li> <li>• obtain information in terms of Aggressive Chemical Environment for Concrete Class (ACEC Class).</li> </ul> <p>Following investigation, assessment will be required to:</p> <ul style="list-style-type: none"> <li>• update the Ground Model;</li> <li>• update the Geotechnical Risk Register;</li> <li>• provide Geotechnical Design recommendations;</li> <li>• update the Conceptual Site Model (CSM), including identification of plausible pollution linkages;</li> <li>• undertake generic quantitative risk assessment of potential chemical contaminants to establish ‘suitability for use’ under the current planning regime;</li> <li>• discuss potential environmental liabilities associated with land contamination (soil, water and gas); and</li> <li>• provide outline mitigation recommendations to ensure the site is ‘suitable for use’.</li> </ul>
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This Executive Summary forms part of Hydrock Consultants Limited report number 15659-HYD-XX-ZZ-RP-DS-0001 and should not be used as a separate document.

## 1. INTRODUCTION

### 1.1 Terms of reference

In May 2020, Hydrock Consultants Limited (Hydrock) was commissioned by R&P Clean Power Ltd (the Client) to undertake a desk study at the site of the proposed Swadlincote Resource and Recovery Plant (SRRP). The proposed development comprises an Energy Recovery Facility (ERF) and an Aggregate Recycling Facility (ARF) known as the SRRP.

The main site area (ERF and ARF areas) is currently a rectangular shape of land to the north west, comprising vegetated areas and woodland trees. To the immediate north of this area is a disused rail line. Together with a linear existing access road to the east and south of the main area which crosses an existing railway to the south west. The majority of this access road has already been developed and only minor changes are proposed for the current development.

The works have been undertaken in accordance with Hydrock's proposal referenced (C-15659-FP-GE-0001 dated on May 2020) and the Client's instructions to proceed via email in October 2020.

### 1.2 Objectives

The works have been commissioned to accompany the planning applications for the proposed SRRP development.

The objective of the Phase 1 Desk Study is to formulate an outline Conceptual Ground Model of the site to identify key geo-environmental and geotechnical risks to the proposed development.

### 1.3 Scope

The scope of the Phase 1 Desk Study comprises:

- a field reconnaissance (walkover) to determine the nature of the site (ERF and ARF areas) and its surroundings including current and former land uses, topography and hydrology;
- acquisition and review of:
  - historical Ordnance Survey maps, to identify former potentially contaminative uses shown at the site and immediately surrounding it, and an assessment of the associated contamination risks;
  - a third-party environmental report to identify flooding warning areas, local landfills, pollution incidents, abstractions, environmental permits etc. which may have had the potential to have environmental impact on the site;
  - topographical, geological and hydrogeological maps;
- a review of previous investigations carried out at the site, including but not limited to previous Coal Mining Risk Assessments;
- development of a preliminary Ground Model representing ground conditions at the site;
- development of an outline Conceptual Model (oCM), including identification of potential pollution linkages;
- a qualitative assessment of any geo-environmental risks identified; and
- identification of plausible geotechnical hazards and the risks they may pose.



## 1.4 Available information

The following have been provided to Hydrock by the Client for use in the preparation of this report:

- Stephen George Architects (SGP). 27/02/22. 'Proposed SRRP Site Plan' Rev L, (Ref: 21-137-SGP-01-ZZ-DR-A-131001);
- Updated site zone plan; Stephen George Architects (SGP). 25/04/22. 'Zone Plan' Rev E, (Ref: 21-137-SGP-01-ZZ-DR-A-131009) and has been presented in Figure 2.4 to detail the areas discussed in this report;
- Updated red line boundary; Stephen George Architects (SGP). CAD version, received September 22. 'Location Plan – SRRP' Rev H, (Ref: 21-137-SGP-01-ZZ-DR-A-131000);
- Stephen George Architects (SGP). 13/09/22. 'SRRP – Masterplan – Point of Connection' Rev B, (Ref: 21-137-SGP-01-ZZ-DR-A-131014);
- Stephen George Architects (SGP). 25/05/22. 'Proposed Zone C – Revised Access Road' Rev A, (Ref: 21-137-SGP-01-ZZ-DR-A-131013);
- Western Power Distribution. 21/03/2020. 'Development Site', (Enquiry number 3647529);
- SDA Design Consultants. Oct 2020. 'General Arrangement Site Plan', (Ref: 201009); and
- Geo-Environmental Appraisal, comprising desk study and ground investigation data, undertaken by Groundtech Consulting (reference GRO-20195-1699, dated September 2020) location and plan presented in Figure 2.12; and
- Coal Mining Risk Assessment for a Proposed Weighbridge Office and Canteen at Willshee Swadlincote, provided for Willshee Skip Hire and undertaken by GeoInvestigations Ltd (reference BH-396-R-01, dated July 2018).

It is understood that these documents are likely to change before the design has been finalised.

## 1.5 Regulatory context and guidance

The geo-environmental section of this report is written in broad agreement with BS 10175:2011+A2:2017, 'Land Contamination: Risk Management' (LCRM, 2019) and the AGS (2006) 'Good Practice Guidelines for Site Investigations'. The methods used follow a risk-based approach, with the first stage being a Phase 1 desk study and field reconnaissance (this report), with the potential geo-environmental risk assessed qualitatively in future report(s) using the 'source-pathway-receptor contaminant linkage' concept to assess risk as introduced in the Environmental Protection Act 1990 (EPA, 1990).

The geotechnical section of this report is prepared in general accordance with BS EN 1997 (EC7) and BS 8004:2015. This report forms the Preliminary Sources Study Report (PSSR) as defined by DMRB CD622.

Where relevant the NHBC Standards (2020), have also been applied.

Remaining uncertainties and recommendations for further work are listed in Section 5 and Section 6.

Reference to the technical details of the approach and the methodologies adopted are provided in Appendix G.

## 2. PHASE 1 STUDY (DESK STUDY AND FIELD RECONNAISSANCE)

### 2.1 Data

A number of desk study sources have been used to assemble the following information. These are presented in Appendix D and include:

- Third-party environmental report (Groundsure report, reference HYD-8327962, dated 11.11.21);
- A Consultants Coal Mining Report (ref HYD-8327961 / 51002715231001);
- Geo-Environmental Appraisal, comprising desk study, ground investigation data and consultants coal mining report, undertaken by Groundtech Consulting (reference GRO-20195-1699, dated September 2020);
- Coal Mining Risk Assessment for a Proposed Weighbridge Office and Canteen at Wilshee Swadlincote, provided for Wilshee Skip Hire and undertaken by GeoInvestigations Ltd (reference BH-396-R-01, dated July 2018);
- Historical Ordnance Survey mapping;
- BGS Archive Records;
- Zetica UXB Risk Maps (<https://zeticauxo.com/downloads-and-resources/risk-maps/>);

### 2.2 Site referencing

The site is referenced in Table 2.1 and the location is indicated in Figure 2.1 and Figure 2.2.

Table 2.1: Site referencing information

Item	Brief Description
Site name	Swadlincote Resource and Recovery Park
Site address	Willshees Depot 3, Keith Willshee Way, Swadlincote, Derbyshire, DE11 9EL
Site location and grid reference	The site is located to the west of Swadlincote, adjacent to the A444. Grid Reference SK 27008 19016. Approximate coordinates 427008E 319016N.



Figure 2.1: Site location  
(Reproduced with permission from Groundsure)

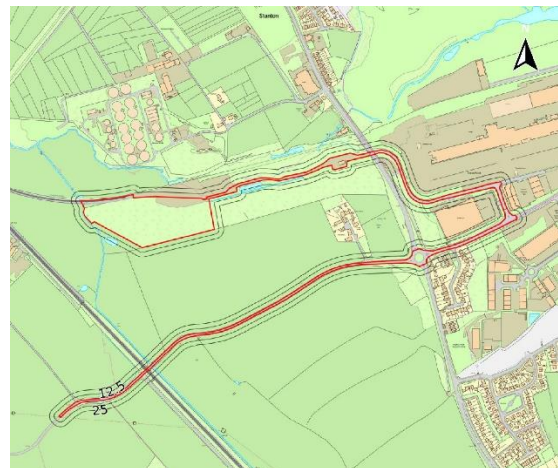


Figure 2.2: Extract from the Ordnance Survey Map.  
(OS licence 100023353).



A site location plan (Hydrock Drawing 15659-HYD-XX-XX-DR-GE-1001) is presented in Appendix A and below in Figure 2.3 and in Figure 2.4 detailing the proposed ERF and ARF areas.

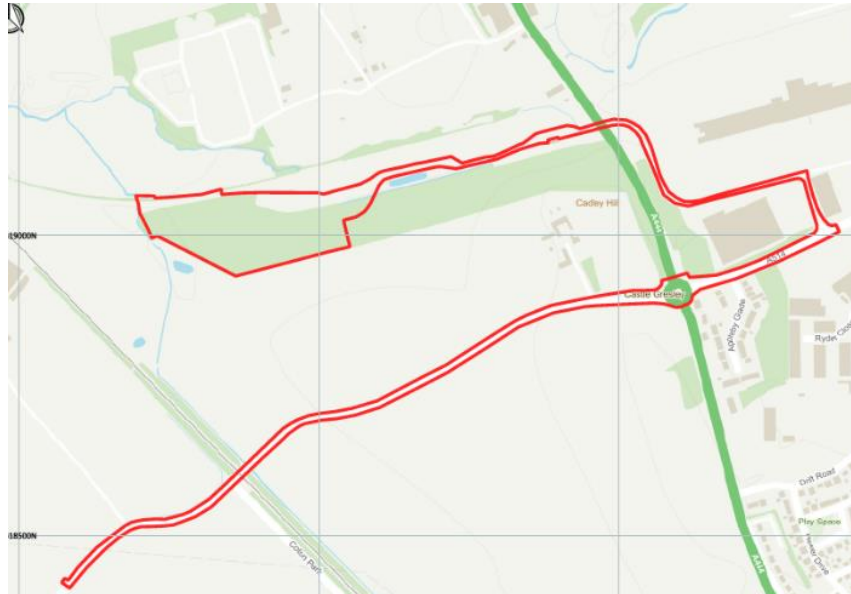


Figure 2.3: Site location plan extract (provided in Appendix A).

(OS data © Crown copyright and database right 2022)

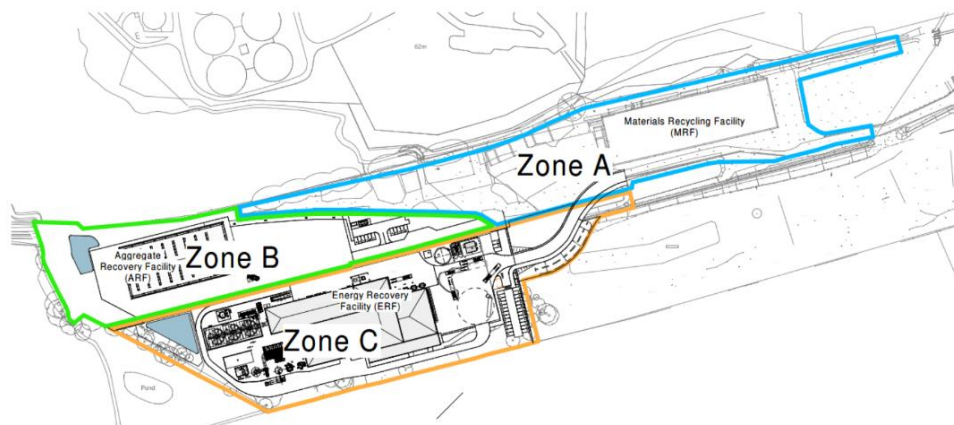


Figure 2.4: Site description of ARF and ERF areas (taken from previous red line boundary)

(Reproduced from available information provided to Hydrock)

## 2.3 Site description and field reconnaissance survey

A field reconnaissance survey was undertaken on 4<sup>th</sup> December 2020 to visually assess potential geotechnical hazards, contaminant sources and receptors. The weather during the field reconnaissance survey was cold, windy and damp. This reconnaissance only covered the area detailed below as part of the original scope. The proposed red line area has since been extended and changed. However, as part of the survey the surrounding area has also been included in this report, but not visited in person. No

reconnaissance of the existing access road and proposed grid connection points has been undertaken at this stage but can be undertaken before site investigation takes place. It should be noted that site is quite overgrown.

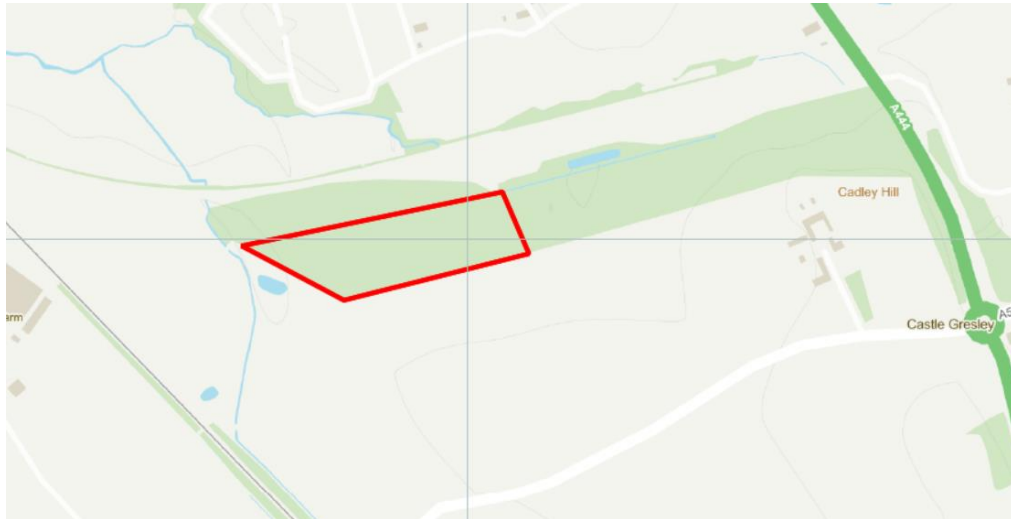


Figure 2.5: Area covered by the field reconnaissance survey prior to site changes

A basic site description is presented in Table 2.2 and selected photographs are presented in Figure 2.6 to Figure 2.9. Additional photographs are presented in Appendix B.

Table 2.2: Site description

Item	Brief Description
Site access	The site is accessed via an underpass of the A444 coming from the A514, Cadley Hill Road. Through Wilshees Recycling and Skip Hire centre.
Site area	The main body of the site is rectangular in shape and has an area of approximately 5.4 ha. The proposed access road and existing access road is broadly linear and with the inclusion of the neighbouring MRF site has an approximate area of 9.2 ha.
Elevation, topography and any geomorphic features	<p>The Darklands Brook runs to the west of the site, and is culverted to the east just south of the new access road.</p> <p>The site is generally flat lying with gentle slopes down to the site for access (from adjacent hardstanding) in the northwest and slopes towards the southwest generally.</p> <p>There is a man-made culverted drainage ditch that appears to have been previously diverted and is present under the site.</p> <p>To the west of the site is what used to be overhead power lines, these have recently been buried – northwest to southeast orientation.</p> <p>There are small stockpiles of, what appears, to be natural material dotted around the site. It should be noted that the site is very soft underfoot.</p> <p>The area of the proposed access road and existing access road is generally flat lying.</p>
Present land use	The main body (ERF and ARF area) of the site itself is currently not in use. However, the access road to the south serves the existing industrial estate. The nearest facilities are a sewage works located 180m to the north of the site, and Willshees Materials Recycling Facility (MRF) immediately to the north east. Access to the site is via the established access off Keith Willshee Way.

Item	Brief Description
Vegetation	<p>The vegetation consists of woodland, containing trees with broad leaves, such as oak, beech and elm. There are various smaller shrubs at floor level and the site is generally, very overgrown. Several areas have been cut back to allow the previous ground investigation access.</p> <p>To the southwest of the site is located an area designated as Lowland fens.</p>
General site sensitivity	The site is classified as agricultural Grade 4 (poor quality agricultural land).
Site boundaries and surrounding land	<p>The main body (ERF and ARF areas) of the site bounds with Darklands Brook to the west, a disused rail line to the north can be seen in disrepair, and a small man-made track marks the boundary immediately to the north. Beyond the train line there is an agricultural area and sewage works. To the south of the site are agricultural fields with a small pond to the southwest.</p> <p>The route of the proposed access track passes through the existing MRF and past a settlement lagoon.</p>



Figure 2.6: Entrance to adjacent site and access road to the proposed development



Figure 2.7: Culvert and waterway



Figure 2.8: Track to the north of the site



Figure 2.9: Electricity cables through the northwest of the site buried with what looks to be Made Ground



## 2.4 Site history

A study of historical Ordnance Survey maps (Appendix C) has been undertaken to identify any former land uses at the site and surrounding areas which may have geotechnical or geo-environmental implications for the proposed development. The key findings are summarised in Table 2.3.

Table 2.3: Site history review

Reference	Key Features on Site	Key Features off Site
OS Map 1882 – 1923; 1:2,500 1882; 1:10,560	Agricultural and woodland fields A field boundary is marked through the middle of the site. The route of the proposed access track to the east passes through an area of rough ground and past ‘force pump’ and towards Far Leys Farm.	Train line to the north of the site. Far Lays Farm to the east of the A444. The eastern extent of the access road is adjacent to Cadley Hill Colliery. By 1925, there is a reservoir adjacent to the access road by Far Leys Farm and numerous railway lines linking the Colliery to the east to Swadlincote Branch railway to the north.
OS Map <sup>1</sup> 1959 - 1960; 1:2,500 1955; 1:10,560		Sewage works located to the north of the site beyond the train line. The Cadley Hill Colliery at the eastern extent of the access road is no longer detailed, however buildings and a mine remain.
OS Map <sup>2</sup> 1970; 1:2,500	The access road area to the east of the ERF and ARF area has several rail lines present – likely a rail yard. With lighting towers present on site.	A canal appears in the OS Maps parallel to the train lines coming from the northeast. Stops before arriving to the site. A large tip is present to the north of the eastern extent of the access road.
OS Map 1980; 1:10,000	Mapping indicates the northern field boundary contains non-coniferous trees and scrub.	Far Lays Farm is not there anymore and an industrial estate is shown in the maps
OS Map 1993; 1:2,500	Railway tracks present on the access road to the east is no longer present on mapping.	Possible culverted drain is now present to the south of the access road as a single linear feature. 2 small buildings are present to the north of the access road.
Google Earth Imagery 2019-2020		Wilshees MRF waste treatment is constructed and operational to the northeast of the site. The former tip to the northeast, at the eastern extent of the access road is no longer detailed.

## 2.5 Geology

The general geology of the site area is shown on the 1:50,000 British Geological Survey (BGS) map extract reproduced as part of the Groundsure report and is summarised in Table 2.4. Extracts from the map are shown in Figure 2.10 and Figure 2.11.

Table 2.4: Geology

<sup>1</sup> Ordnance Survey Historical Map Information provided by Groundsure.

<sup>2</sup> Ordnance Survey Historical Map Information provided by Groundsure.

Ref. for Figures	Location	Stratigraphic Name	Description
Made Ground			
Not referenced	On site	Made Ground	Origin unknown but generally comprises man-made constituents with a sand or clay matrix. Likely associated with the small culverted ditch to the northeast boundary of the site and any activities from the neighbouring site.  The route of the proposed access road to the east runs through an area of Made Ground which also includes worked ground.
Superficial Deposits (Figure 2.10)			
1	On site	Head	Variable clay, silt, sand and gravel, usually poorly sorted, locally with lenses of silt, clay or organic material.
2	On site	Alluvium	Associated with the stream to the north of the site, typically comprising soft to firm clay, silt, sand and gravel sometimes interbedded with peat.
Solid Geology (Figure 2.11)			
1	On site.	Helsby Sandstone Formation	Fine to medium grained, micaceous sandstones, weathering to sand near surface. Thin beds of reddish-brown siltstone and mudstone are common.
2	On site.	Chester Formation	Red brown to yellow grey mudstones interbedded with red brown to yellow sandstone.
3	On site.	Chester Formation	Interbedded Sandstone and Conglomerate. Commonly comprising reddish brown or yellow cross bedded pebbly sandstones with subordinate beds of red brown mudstone.

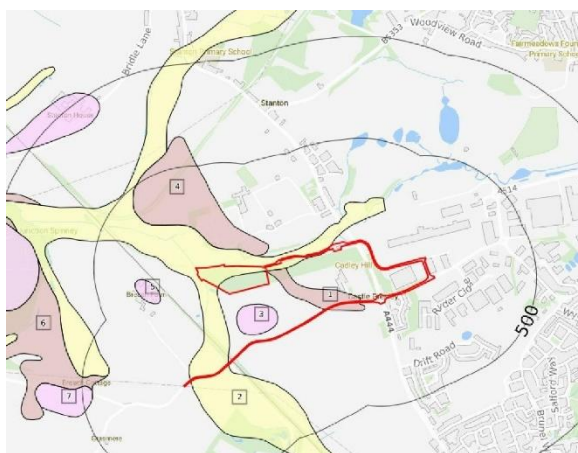


Figure 2.10: Superficial deposits.  
(Reproduced with permission from Groundsure)

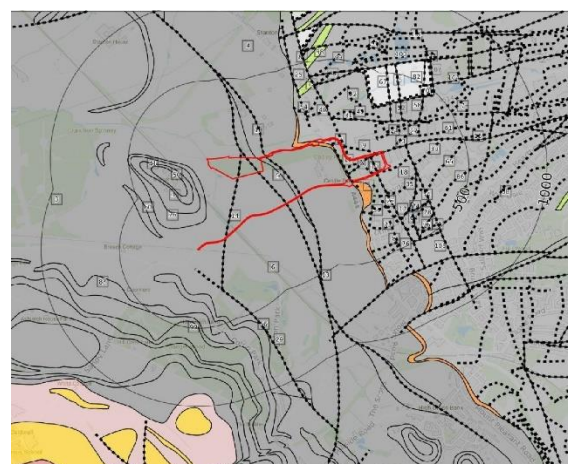


Figure 2.11: Solid geology.  
(Reproduced with permission from Groundsure)

The Groundsure report indicates that 2 normal faults are located onsite.

The ground conditions proven by the previous investigation (Groundtech, 2020) comprise:

- Made Ground to between 0.55m and 2.6m bgl, comprising:
  - Gravelly sand of mixed lithology including brick
  - Black sandy gravelly clay of mixed lithology including brick.
- Light brown, brown and red brown clayey gravelly sand to between 0.70m bgl and 3.00m bgl (no stratum identified, probable weathered Helsby Sandstone Formation);
- Grey mottled orange variably gravelly sandy clay to between 0.90m bgl and 3.00m bgl (not identified, probable Alluvium)
- Extremely weak to weak blue grey to red brown mudstone to between 0.95m bgl and 2.6m bgl (not identified, probable Chester Formation)
- Weathered grey brown to grey sandstone to between 2.00m bgl and 2.70m bgl (not identified, probable Helsby Sandstone Formation).

The ground investigations also notes visible rootlets present to 2.00m bgl. The previous ground investigation location plan and red line plan is presented in Figure 2.12 below.



Figure 2.12: Borehole location plan for previous ground investigation  
(Reproduced from Groundtech Consulting report GRO-20195-1699)

## 2.6 Hydrogeology

### 2.6.1 Aquifer designations

Based on the inferred geological sequence presented in Section 2.5 and the Environment Agency's interactive aquifer designation map, the aquifer system presented in Table 2.5 applies. Additional information on the hydraulic characteristics of the geological units has been abstracted from Allen et al (1997) and Jones et al (2000).

Table 2.5: Aquifer system



Stratum	Aquifer Designation	Comments
Superficial Deposits		
Head and Alluvium Deposits	Secondary A Aquifer	Intergranular permeability. Dominated by moderate to high permeability layers of sand and occasional gravel, interbedded with low permeability clay.
	Secondary undifferentiated Aquifer	Predominantly clay of low permeability, interbedded with occasional layers of sand and gravel, of moderate to high permeability.
Solid Geology		
Helsby Sandstone Formation and Chester Formation	Principal Aquifer	Geology of high intergranular and/or fracture permeability, usually providing a high level of water storage and may support water supply.

### 2.6.2 Groundwater abstraction

There are no active licensed groundwater abstractions within 1000m of the site.

### 2.6.3 Groundwater source protection zones and groundwater vulnerability

The site is not within a groundwater Source Protection Zone (SPZ), see Figure 2.13. The Groundsure report indicates that the groundwater vulnerability of the site as High, see Figure 2.14.



Figure 2.13: Groundwater abstraction zones  
(Reproduced with permission from Groundsure)

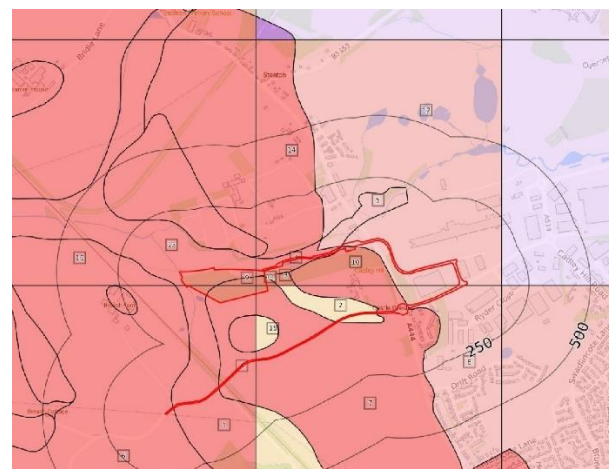


Figure 2.14: Groundwater vulnerability  
(Reproduced with permission from Groundsure)

### 2.6.4 Groundwater levels, recharge, and flow

The BGS Hydrogeological maps are not available for this area.

Shallow groundwater is likely to be present within the Head Deposits and Made Ground, with a deeper groundwater body present in the Helsby Sandstone Formation and Chester Formation.

Recharge to the superficial deposits would be expected to take place but be limited by its low permeability and the presence of numerous drainage systems across the neighbouring MRF site and access road area.

Previous ground investigations (Groundtech, 2020) recorded groundwater between 2.10m bgl and 2.70m bgl within the Chester Formation and Alluvial Deposits, see Figure 2.12 for borehole locations. However, the local watercourse (to the northeast) has been altered with the installation of a culvert and swale, these are man-made and may be locally modifying the groundwater flow regime.

Groundwater flow is likely to be to the north. However, this has not been confirmed by the current ground investigation.

### 2.6.5 Groundwater quality

The groundwater body beneath the site (Tame Anker Mease – Permo Triassic Sandstone Burton) is currently (2019 Cycle 2) classified under the Water Framework Directive as ‘poor’.

The water body is currently given a 'poor' status due to 'chemical dependant surface water body' conditions. The objective is for chemical dependant surface water body status to be ‘poor’ by 2027.

### 2.6.6 Groundwater flooding

The environmental data report indicates a high risk of groundwater flooding.

## 2.7 Hydrology

### 2.7.1 Surface water system and drainage

The surface water features in the vicinity of the site are listed in Table 2.6.

Table 2.6: Surface water features

Feature	Location Relative to Site
Unnamed – likely diverted watercourse, culverted under the adjacent site to the north. Including open surface water feature.	On site, to the north and to the southwest
Darklands Brook	5m east

### 2.7.2 Surface water abstractions and discharges

There is one surface water abstraction licence active 2m to the northwest the site used for agricultural spray irrigation.

There are 27 active licensed surface water discharges within 500m of the site. They are listed in Table 2.7.

Table 2.7: Surface water discharges

Location Relative to Site	Purpose of Abstraction
162m to 173m N (7 discharges)	Stanton Sewage Treatment Works - Sewage

Location Relative to Site	Purpose of Abstraction
58m N (20 discharges)	Nandis Open Coast Coal Site – Mineral workings and site drainage

### 2.7.3 Surface water quality

Reference to the Environment Agency web site shows the site is located within the catchment of the Tam Anker and Mease, with the specific river water body being the Darklands Brook. The current (2019 cycle 2) overall status under the Water Framework Directive is ‘moderate’.

The water body is currently ‘poor’ status due to Cypermethrin levels. The objective is for these levels to be ‘good’ by 2027.

### 2.7.4 Surface water flooding

The desk study information indicates that part of the proposed development, including the eastern and southern access roads/grid connection locations, are within Zone 3 (with a high/significant probability of flooding from rivers or the sea), see Figure 2.15 and Figure 2.16.

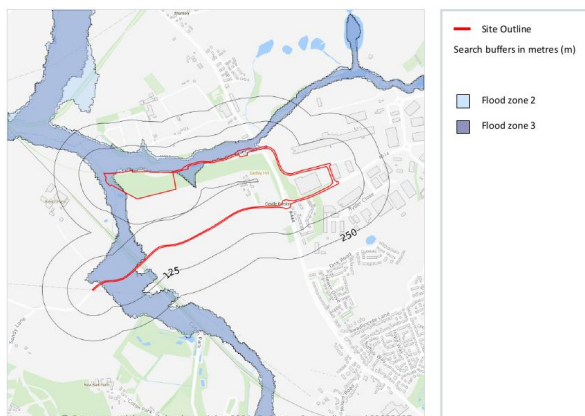


Figure 2.15: Flood zones  
(Reproduced with permission from Groundsure)

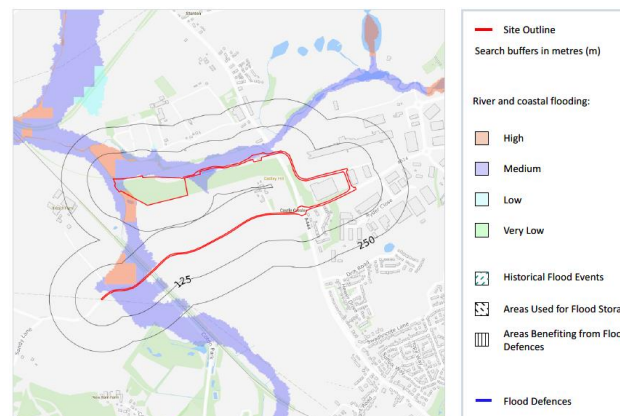


Figure 2.16: River and Coastal flooding  
(Reproduced with permission from Groundsure)

No further consideration of flood risk is undertaken in this report. Specialist flood risk advice should be sought with regard to drainage and flooding.

## 2.8 Mining, mineral extraction and ground works

There are a number of sites within 500m of the site.

Table 2.8: Mining, mineral extraction and ground works

Location Relative to Site	Mining, mineral extraction and ground works
24m N	Pond

Location Relative to Site	Mining, mineral extraction and ground works
51m-79m N	Shafts and adits associated with Cadley hill Colliery (to the north of the eastern extent of the proposed access road).
63m N	Cuttings – shown on mapping 1882 – 1938 likely associated with the railway.
243m E	Underground iron ore mining
296m NE	Stanton Sand Pit – records indicate this activity has ceased.

Hydrock has been provided with a Coal Mining Risk Assessment (CMRA) undertaken for the neighbouring Wilshees Materials Recycling Facility (MRF) and covers the current proposals high risk area (see Figure 2.17 below detailing the Coal Authority high risk zones and Figure 2.18 detailing the CMRA area) and some of the access road, provided in Appendix D dated July 2018. This does not cover the new proposals for the development of the SRRP, see Figure 2.4 for reference. It does however, cover part of the access road to the site included in the planning application. This report identifies that the risk to the Wilshees MRF development is very low with regards to subsidence due to the depth of the coal seams and the overlying solid and superficial geology.

The majority of the current development proposals cover an area overlain by Alluvial soils, which are likely to be saturated at shallow depth. The underlying Helsby Sandstone and Chester Formation is likely to have a high groundwater level, as the site is close to a water course and located at the bottom of a valley. This would have made early shallow coal mining very difficult and is unlikely that any workings would have been attempted given the approximate depths of seams below the site are between 130m to 260m below ground level. The previous ground investigation undertook 15 boreholes, three of which encountered groundwater at between 2.0m to 3.0m below ground level (bgl).

An updated Coal Authority Consultants Coal Mining Report has since been undertaken. The coal mining report (ref: 51002715231001, dated: 11<sup>th</sup> November 2021) indicated the following:

- There are no coal authority managed tips within 500m of the site
- The coal authority has not received a damage notice or claim for coal mining related subsidence within 50m of the site since October 1994
- There is a single record of mine gas, at approximately 91m to the northeast within an area already developed, however it should be noted that this was not present on the 2018 report for the site and as such is likely a recent occurrence.
- There are no records of any mine water treatment schemes within 500m of the site.
- There are no records of any licenses for future or current coal mining activities within 200m of the site.
- There are no records of the land being at risk of subsidence.
- The site is noted as being in an area where a withdrawal to support notice was given in 1956
- The site, however within an area of historical coal mining activity and is within an area of interest with regards to mine gas remedial works.



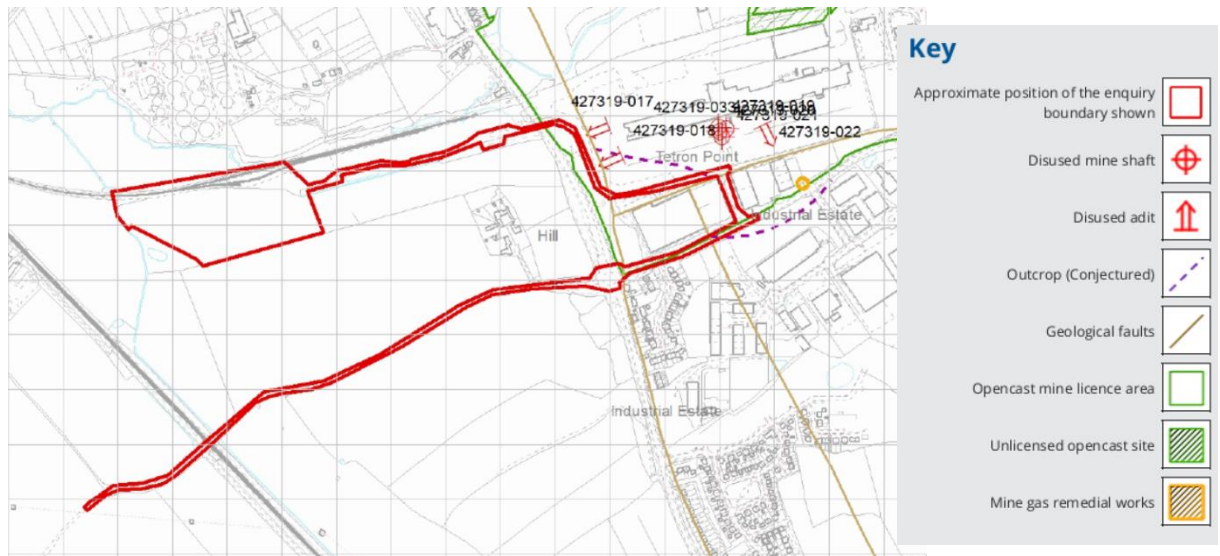


Figure 2.17: Coal Authority Site Plot (high risk to the east of Willshees WRF)  
(Reproduced from the Coal Authority Consultants Coal Mining Report)

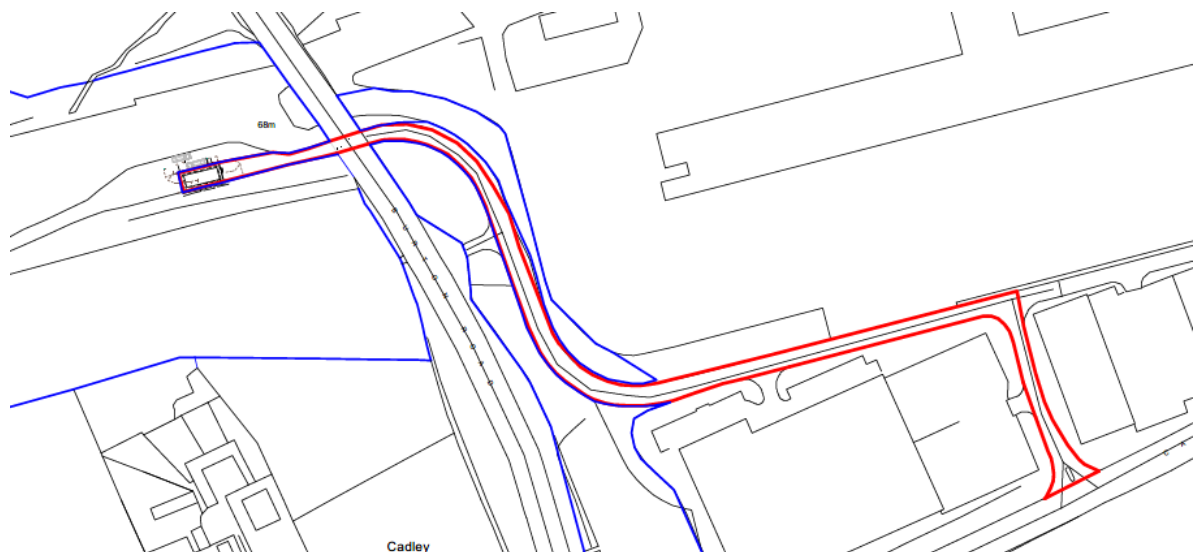


Figure 2.18: Coal Mining Risk Assessment for proposed Weighbridge and Office  
(Reproduced from CMRA report provided to Hydrock from Geoinvestigations Ltd)

Whilst the Coal Authority Consultants Coal Mining Report recommends a Mine Gas Emissions Report it is Hydrock's opinion that once all elements of the design have been finalised an informed risk assessment regarding mine gas can be made. As an intrusive investigation is likely to be a planning condition for the wider SRRP site, and no previous investigation of the northern area or geotechnical investigation has been undertaken at this time, this can be made part of that detailed assessment process.

The previous investigation, produced by Groundtech Consulting and provided in Appendix D, has undertaken an initial round of ground gas readings which have indicated very low levels of carbon dioxide. See Figure 2.12 for borehole locations. Given the high groundwater levels recorded in three

boreholes, approximately 2.0m to 3.0mbgl, ground gas will likely not be an issue on site. However, there is not enough data over a long enough period to accurately present a gas screening value at this time. Or undertaken a mine gas risk assessment based on CL:AIRE October 2021. The current risk from ground gas is however, considered to be low.

## 2.9 Natural ground instability

Despite the presence of trees and vegetable cover the environmental report indicates that the hazard due to shrink swell clays is negligible to very low.

The hazard for running sands, collapsible deposits, dissolution of soluble rocks and landslides is recorded as negligible to low.

The Alluvial deposits are likely to be cohesive in nature and the Head Deposits may be partially cohesive with both stratums considered to be normally consolidated. The Alluvial Deposits are considered to be moderately compressible, however, based on observation of ground conditions during the site reconnaissance visit Hydrock assumes this to be highly compressible in areas containing Alluvial soils. While the Head deposits are considered to be potentially compressible depending upon their exact composition. In practical terms, this means that soils are likely to experience subsidence or settle when a load is applied (e.g. raising site levels or a structure is built).

Due to the nature of the soils present and the location of water courses, excavations are likely to be unstable unless supported and groundwater or perched water may be present at a shallow depth.

## 2.10 Waste management

There are 3 waste management sites recorded and 1 exemption within 250m of the site, as listed in Table 2.9.

Table 2.9: Waste management sites

Site Name and Location	Details
Site Address: Willshee's Skip Hire Ltd and Wilshee's Waste and Recycling Ltd. 58m northeast 66m northeast	Status: active Type of Site: - Waste Transfer Station - Physical Treatment facility (>25000 tonnes) Operational dates: - Issued 26/10/2018 - Issued 22/03/2018
Associated with Wilshees Waste and Recycling 47m north	Storing waste exemption Using waste exemption Treating waste exemption (Storage of waste in a secure place, storage of waste in secure containers, use of waste in construction, sorting mixed waste, manual treatment of waste, preparatory treatments, screening and blending of waste, treatment of waste wood and waste water plant matter, recovery of scrap metal)
Stanton Refuse Tip, Woodland Rd, Stanton Staffs, 229m north	BGS landfill 2483 (historical landfill).

## 2.11 Natural soil chemistry

Information contained within the environmental report (Appendix D) gives indicative (estimated) concentration values for the natural soils at the site for a selection of Contaminants of Potential Concern (CoPC). These have been reproduced in Table 2.10.

Table 2.10: Natural soil chemistry

Element	Arsenic	Cadmium	Chromium	Lead	Nickel
Concentration (mg/kg)	15-25	3.0-6.0	60-90	300-600	15 - 30

The data in Table 2.10 is considered within the geo-environmental assessment. While Cadmium is slightly higher than normally seen, considering the end use of the proposed development Hydrock does not see this as a potential contamination issue. The previous investigation (Groundtech, 2020) has also undertaken 14 heavy metal analyses and confirms that this higher than average background level is not an issue at the proposed site.

## 2.12 Radon

The radon risk is reported in the environmental report.

The guidance indicates that the site is not in a Radon Affected Area (less than 1%) and no radon protection measures are required.

## 2.13 Unexploded ordnance (UXO)

In general accordance with CIRIA Report C681 (Stone et al 2009) a non-specialist UXO screening exercise has been undertaken for the purposes of ground investigation and is presented in Appendix D.

The non-specialist UXO screening exercise has indicated no further assessment is required with regard to UXO in relation to ground investigation. Further assessment may be considered prudent for construction activities.

A copy of the UXO desk study is included in Appendix D.

## 2.14 Reliability of previous data

Data from the previous ground investigation report listed in Section 1.4 have been considered during the preparation of this report where considered to be reliable. The section below provides comment as to the applicability of the various data available.

### *Geological data*

The geological data from previous investigation are consistent with the anticipated ground conditions from BGS sources. However, there is very little interpretation of the geological units and therefore Hydrock's re-interpretation of the stratigraphy has been undertaken.

### *Chemical test data*

The testing undertaken at the site, whilst very recent has not been undertaken by an MCERTS accredited laboratory, consequently these data may be considered less reliable. However, it is Hydrock's opinion that the chemical data does have value as an indicator of expected contamination

distributions and together with other site observations will be used to help characterise the site and act as an aid in directing further investigations.

#### *Groundwater data*

Whilst the desk study data is relevant there has not been any groundwater chemical testing undertaken at the site.

#### *Ground gas data*

There is some ground gas data available for the site. However, this does not meet the requirements of CIRIA C665 and additional boreholes and monitoring is required. The data that has been recorded has been used in this report.

#### *Geotechnical data*

Whilst the available geotechnical information is sparse (with only 3 boreholes penetrating the alluvial and glacial sequence to the Mercia Mudstone), it remains relevant as a guide to physical ground conditions. However, significant supplementary investigations will be required as related to the new development proposals.



### 3. OUTLINE CONCEPTUAL SITE MODEL

#### 3.1 Introduction

The outline Conceptual Model (oCM) incorporates evidence from the site walkover, the Desk Study and previous investigations carried out at the site. The formulation of an outline Conceptual Model is a key component of the LCRM methodology. The oCM incorporates a ground model of the site physical conditions and an exposure model of the possible contaminant linkages; it forms the basis for Generic Quantitative Risk Assessment (GQRA) in accordance with current guidelines.

#### 3.2 Ground model

The preliminary ground model presented in Section 2 provides an understanding of the ground conditions and is the basis for preparing the preliminary geotechnical hazard assessment (Section 3.3) and the preliminary geo-environmental exposure model (Section 3.4).

#### 3.3 Geotechnical hazard identification

##### 3.3.1 Context

The preliminary geotechnical hazard identification has been undertaken in accordance with the general requirements of ICE/DETR Document 'Managing Geotechnical Risk' and the HE documents HD 41/15 and CD 622.

The following section sets out the identified geotechnical hazards and the development elements potentially affected (see Table E.1 in Appendix E for further information).

##### 3.3.2 Plausible geotechnical hazards

Plausible geotechnical hazards identified at the site are:

- Uncontrolled Made Ground (variable strength and compressibility).
- Soft / loose compressible ground (low strength and high settlement potential).
- Shrinkage / swelling of the clay fraction of soils under the influence of vegetation.
- Variable lateral and vertical changes in ground conditions.
- Shallow groundwater.
- Risk from flooding in the northeast.
- Slope stability issues – general slopes.
- Earthworks – poor bearing capacity of new fill.
- Problematic soils.

##### 3.3.3 Potential development elements affected

Development elements potentially affected by geotechnical hazards are:

- Buildings – foundations.
- Buildings – floor Slabs.
- Roads and pavements.

- Services.
- General slopes.
- Retaining walls.
- Construction staff, vehicles and plant operators.
- Concrete below ground.
- Earthworks control, inability to place and compact fill.
- Insufficient fill to complete earthworks.

Health and safety risks to site Contractors and maintenance workers have not been assessed during these works and will need to be considered separately during design.

The above plausible geotechnical hazards and development elements affected have been carried forward for investigation and assessment.

## 3.4 Geo-environmental exposure model

### 3.4.1 Context

The preliminary exposure model is used to identify geo-environmental hazards and to establish potential pollution linkages, based on the source-pathway-receptor (SPR) approach.

A viable pollution linkage requires all the components of an SPR to be present. If only one or two are present, there is no linkage and no further assessment is required.

### 3.4.2 Potential contaminants

For the purpose of this assessment the potential contaminants have been separated according to whether they are likely to have originated from an on-site or off-site source.

#### *Potential on-site sources of contamination*

- Ground gases (carbon dioxide and methane) from organic materials in the Made Ground / alluvial deposits (S1).
- Made Ground, associated with the burial of electricity cables in the west of the site, possibly including elevated concentrations of metals, metalloids, asbestos fibres, asbestos containing materials (ACM), polycyclic aromatic hydrocarbons (PAH) and petroleum hydrocarbons (S2).
- Made Ground and worked ground beneath the proposed access road, to the east of the main body of the site and man-made culverted ditch (S3), including elevated concentrations of metals, metalloids, asbestos fibres, asbestos containing materials (ACM), polycyclic aromatic hydrocarbons (PAH) and petroleum hydrocarbons.

#### *Potential off-site sources of contamination*

- Made Ground, associated with historical and current (Wilshees MRF) construction activities and imported fill, possibly including elevated concentrations of metals, metalloids, asbestos fibres, ACM, PAH and petroleum hydrocarbons of the current waste treatment works located to the east of the site (S1).
- Hydrocarbon fuels, lubricant and chlorinated solvents from the operation of the current waste treatment works on the east of the site (S2).

- Residual contamination from sewage works that present north to the site, potentially containing elevated metals, detergents, inorganic and organic contaminants and possibly (although unlikely) pathogenic contaminants such as faecal coliforms (S3).

### 3.4.3 *Potential receptors*

The following potential receptors in relation to the proposed land use have been identified.

- People (site end users) (R1).
- Development end use (R2).
- Groundwater: Secondary A aquifer status of the Head and the Alluvium (R3).
- Surface water: river to the west of the site, on-site drainage ditch and off-site pond. (R4).
- Ecology: fields and surface water bodies surrounding the site (R5).

### 3.4.4 *Potential pathways*

The following potential pathways have been identified.

- Ingestion, skin contact, inhalation of dust and outdoor air by people (P1).
- Methane ingress via permeable soils and/or construction gaps (P2).
- VOC and petroleum hydrocarbon vapour ingress via permeable soils and/or construction gaps (P3).
- Root uptake by plant (P4).
- Methane ingress to the root zone by plants (P5).
- Migration of contaminants via leachate migration through the unsaturated zone in the Alluvium (P6).
- Migration of contaminants from the groundwater within the Alluvium to the groundwater within the Helsby Sandstone and Chester Formation aquifer (P7).
- Surface water via overland flow (P8).
- Surface water, via drainage discharge (P9).
- Surface water via base flow from groundwater (P10).

Health and safety risks to site development contractors and maintenance workers have not been assessed as part of this study and will need to be considered separately.

The above sources, pathways and receptors have been considered as part of the Preliminary Risk Assessment in accordance with LCRM (2019), are considered to be plausible in the context of this site and have been carried forward for investigation and assessment. An assessment of the Source – Pathway – Receptor linkages is presented in Appendix F (Table F.1).

## 4. DESK STUDY CONCLUSIONS

### 4.1 Geotechnical conclusions

The following plausible geotechnical risks are identified.

- Low strength, compressible ground – risk of shear failure and excessive settlement of foundations, roads and infrastructure elements.
- Shrinkage/swelling of clay – settlement/heave of foundations, especially where located within the influence of trees and vegetation and after vegetation is removed.
- Instability of slopes and impact on foundations, floor slabs, roads and infrastructure and construction plant.
- Earthworks – Low bearing capacity or settlement of new fill and impact on foundations, floor slabs, roads and infrastructure and construction plant.
- Potential for unforeseen ground conditions and the risks associated with limited data.

These plausible risks require further investigation and assessment (see Section 6).

### 4.2 Geo-environmental conclusions

Based on historical and current land uses and in accordance with the processes set out in Appendix G:

- It is considered that it is unlikely that the site would be classified as Contaminated Land under Part 2A of the EPA 1990.
- The overall risk from land contamination at the SRRP site (confined to the ERF and ARF areas) is considered to be low as it has remained undeveloped and mostly covered by woodlands since the beginning of records, with exception to any possible hotspots that may be encountered due to historical activity on the neighbouring Willshees MRF and the railway areas.
- The overall risk for a redeveloped site is assessed to be low, with some specific potentially high risks (possible hot spots), but this would need to be confirmed by appropriate intrusive investigation, testing and assessment. However, this is likely to be mitigation or remediation of localised hotspots and can be investigated and assessed post consent as part of a planning condition.

The possible pollutant linkages (for risk levels of moderate or greater) on an unremediated redeveloped site, as determined by the desk study and walk-over (this is prior to any further investigation which will likely confirm localised hotspots for assessment and potential mitigation or remediation), are summarised in Table 4.1:

Table 4.1: Possible Pollutant Linkages (for risk levels of moderate or greater)

Source(s)	◀ potential Impact on ▶	Receptor(s)
Potential contamination linked to the Wastewater works to the north of the site and the waste treatment/recycling works located immediately northeast of the site		Site users Neighbours Ecosystems
Made Ground, associated with the burial of electricity cables in the west of the site, possibly including elevated concentrations of metals, metalloids, asbestos fibres, asbestos containing materials (ACM), polycyclic aromatic hydrocarbons (PAH) and petroleum hydrocarbons.		Groundwater Buildings/ access road



Source(s)	◀ potential Impact on ▶	Receptor(s)
Made Ground and worked ground beneath the proposed access road, to the east of the main body of the site and man-made culverted ditch (S3), including elevated concentrations of metals, metalloids, asbestos fibres, asbestos containing materials (ACM), polycyclic aromatic hydrocarbons (PAH) and petroleum hydrocarbons.		

These possible pollutant linkages require further investigation and assessment (see Section 6).

## 5. UNCERTAINTIES AND LIMITATIONS

### 5.1 Site-specific comments

It is to be noted that at the time of producing this Desk Study report Hydrock has not had access to all the site areas (due to site boundary changes) and all findings are taken from the Groundsure report.

### 5.2 General comments

Hydrock Consultants Limited (Hydrock) has prepared this report in accordance with the instructions of R&P Clean Power Ltd (the Client), by e-mail dated October 2020 under the terms of appointment for Hydrock, for the sole and specific use of the Client and parties commissioned by them to undertake work where reliance is placed on this report. Any third parties who use the information contained herein do so at their own risk. Hydrock shall not be responsible for any use of the report or its contents for any purpose other than that for which it was prepared or for use of the report by any parties not defined in Hydrock's appointment.

This report details the findings of work carried out in November 2021. The report has been prepared by Hydrock on the basis of available information obtained during the study period. Although every reasonable effort has been made to gather all relevant information, not all potential environmental constraints or liabilities associated with the site may have been revealed.

Groundwater data are only representative of the dates on which they were obtained and both levels and quality may vary.

Information provided by third parties has been used in good faith and is taken at face value; however, Hydrock cannot guarantee its accuracy or completeness.

Where the existing report(s) prepared by others have been provided by the Client, it is assumed that these have been either commissioned by the Client, or can be assigned to the Client, and can be relied upon by Hydrock. Should this not be the case Hydrock should be informed immediately as additional work may be required. Hydrock is not responsible for any factual errors or omissions in the supplied data, or for the opinions and recommendations of others. It is possible that the conditions described may have since changed through natural processes or later activities.

The work has been carried out in general accordance with recognised best practice. The various methodologies used are referenced in Appendix G. Unless otherwise stated, no assessment has been made for the presence of radioactive substances or unexploded ordnance. Where the phrase 'suitable for use' is used in this report, it is in keeping with the terminology used in planning control and does not imply any specific warranty or guarantee offered by Hydrock.

The non-specialist UXO screening has been undertaken for the purposes of ground investigation only (i.e. low risk activity in accordance with CIRIA Report C681). Further assessment should be undertaken with regards to other higher risk activities e.g. construction.

Please note that notwithstanding any site observations concerning the presence or otherwise of archaeological sites, asbestos-containing materials or invasive weeds, this report does not constitute a formal survey of these potential constraints and specialist advice should be sought.

Any site boundary line depicted on plans does not imply legal ownership of land.

## 6. RECOMMENDATIONS FOR FURTHER WORK

### 6.1 Ground investigation objectives

In order to confirm the actual risks to receptors and confirm the ground conditions with respect to potential geotechnical and geo-environmental risks, an appropriate intrusive investigation will need to be undertaken. This investigation will need to:

- Undertake a mine gas emissions risk assessment with reference to ‘Mine Gas Emissions Risk Assessments’ (CL:AIRE, 2021), after final design and potentially after further ground investigation to include groundwater and gas monitoring;
- determine the depth and distribution of Made Ground and natural strata across the site;
- determine the soil strength/density profile beneath the site;
- determine the depth/level of groundwater beneath the site;
- determine the ground gas concentrations beneath the site;
- determine CBRs to assist with pavement design;
- assess trench stability, over break potential and ‘diggability’;
- allow sampling for chemical and geotechnical laboratory testing;
- allow soil classification to allow geotechnical characterisation and determine suitability for reuse of soils within earthworks;
- obtain information in terms of Aggressive Chemical Environment for Concrete Class (ACEC Class).

Following investigation, assessment will be required to:

- update the Ground Model;
- update the Geotechnical Risk Register;
- provide Geotechnical Design recommendations;
- update the Conceptual Site Model (CSM), including identification of plausible pollution linkages;
- undertake generic quantitative risk assessment of potential chemical contaminants to establish ‘suitability for use’ under the current planning regime;
- discuss potential environmental liabilities associated with land contamination (soil, water and gas); and
- provide outline mitigation recommendations to ensure the site is ‘suitable for use’.

### 6.2 Possible scope and rationale for further investigation works

Based on the current data, site investigation works are proposed to comprise:

- the excavation of trial pits to allow collection of samples for geotechnical and chemical analysis, to assess trench stability, over break potential and ‘diggability’ and allow soil infiltration rate testing to be undertaken;
- dynamic sampling and/or cable percussive drilling to allow collection of samples for geotechnical and chemical analysis of shallow and deep soils, and allow *in situ* testing (SPTs) to be undertaken to determine the strength of the clay and assess density of the sands and gravel, and allow the installation of gas and groundwater monitoring wells;

- gas and groundwater monitoring installations to allow gas concentrations and groundwater levels to be monitored in accordance with CIRIA C665;
- geotechnical testing of soils and rock; and
- contamination analyses of soil and groundwater.

Access to the site will be restricted based on the vegetation present during the site reconnaissance visit. Therefore, vegetation clearance will also need to be undertaken prior to any site works. As an intrusive investigation is likely to be a planning condition this can be made part of that process.



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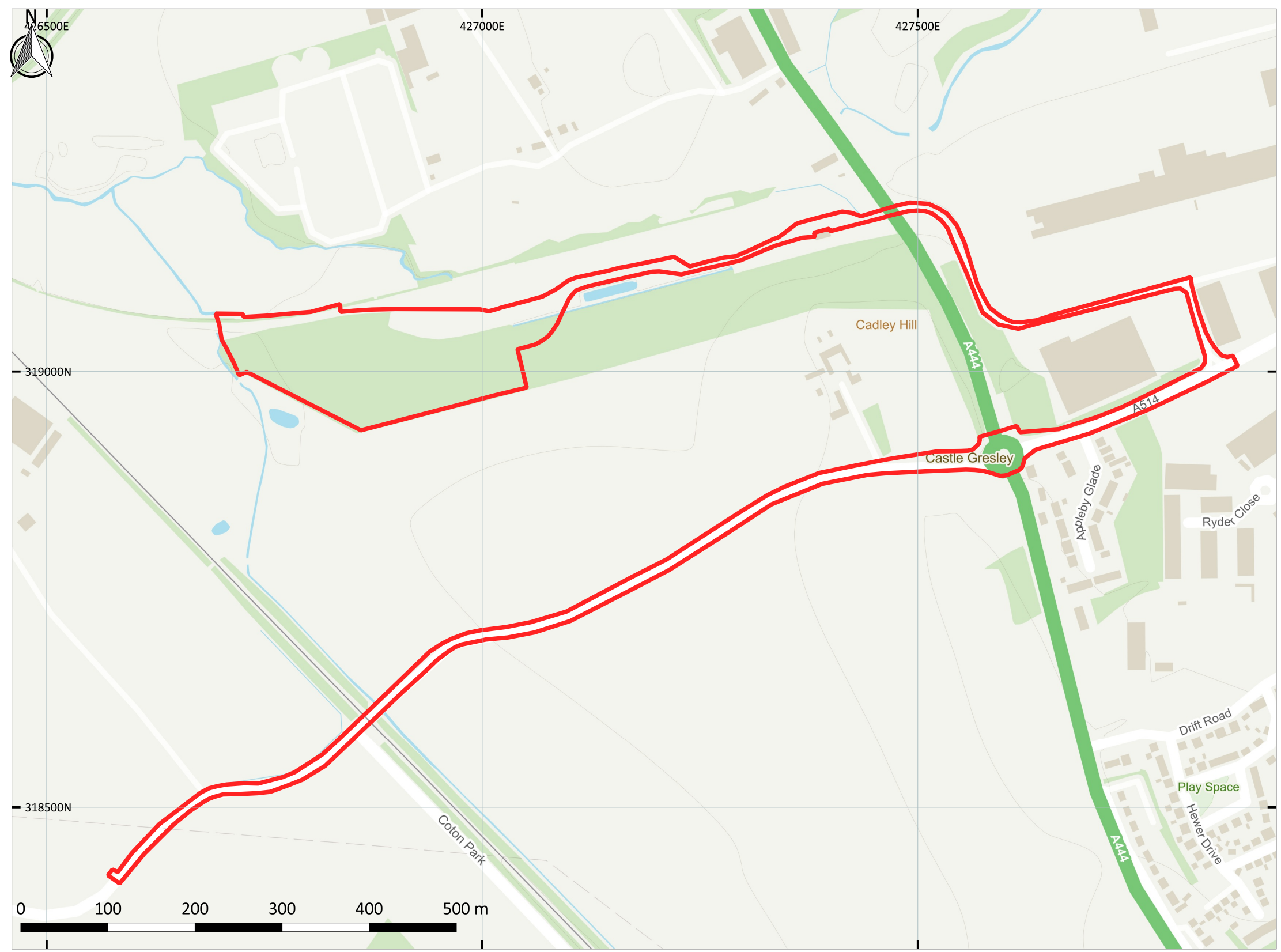
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# Appendix A

## Drawings




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<b>KEY PLAN</b>	
	Site Boundary

<b>NOTES</b>
1. Contains OS data © Crown copyright and database right (2022)

<b>REVISIONS</b>																				
<table border="1"> <thead> <tr> <th>REV.</th> <th>DRAWN BY INITIALS</th> <th>CHECKED BY INITIALS</th> <th>DATE</th> <th>REVISION NOTES/COMMENTS</th> </tr> </thead> <tbody> <tr> <td>P01</td> <td>JEH</td> <td>DH</td> <td>04/01/21</td> <td>First issue</td> </tr> <tr> <td>P02</td> <td>GE</td> <td>JEH</td> <td>16/11/21</td> <td>Second issue</td> </tr> <tr> <td>P03</td> <td>GE</td> <td>JEH</td> <td>14/06/22</td> <td>Third issue</td> </tr> </tbody> </table>	REV.	DRAWN BY INITIALS	CHECKED BY INITIALS	DATE	REVISION NOTES/COMMENTS	P01	JEH	DH	04/01/21	First issue	P02	GE	JEH	16/11/21	Second issue	P03	GE	JEH	14/06/22	Third issue
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**CLIENT**  
R&P Clean Power

**PROJECT**  
Proposed EfW Swadlincote


<b>TITLE</b> SITE LOCATION PLAN		
<b>HYDROCK PROJECT NO.</b> 15659	<b>SCALE @ A3</b> 1:5,000	
<b>PURPOSE OF ISSUE</b> SUITABLE FOR INFORMATION	<b>STATUS</b> S2	<b>REVISION</b> P03
<b>DRAWING NO.</b> 15659-HYD-XX-XX-DR-GE-1001_S2_P03		



## Appendix B

# Field Reconnaissance Photographs

<p><b>Desk Study Photograph 1</b></p>	
<p><b>Date:</b> 04/12/20</p>	
<p><b>Direction Photograph Taken:</b> Looking west from the larger site entrance</p>	
<p><b>Description:</b> Entrance via adjacent site</p>	

<p><b>Desk Study Photograph 2</b></p>	
<p><b>Date:</b> 04/12/20</p>	
<p><b>Direction Photograph Taken:</b> Looking west from adjacent warehouse</p>	
<p><b>Description:</b> Recycling facility at boundary and ponded area</p>	



<p><b>Desk Study Photograph 3</b></p>	
<p><b>Date:</b> 04/12/20</p>	
<p><b>Direction Photograph Taken:</b> Looking east from culvert.</p>	
<p><b>Description:</b> Small culvert at site boundary</p>	

<p><b>Desk Study Photograph 4</b></p>	
<p><b>Date:</b> 04/12/20</p>	
<p><b>Direction Photograph Taken:</b> Looking southeast</p>	
<p><b>Description:</b> Slope down to site area from hardstanding area</p>	



<p><b>Desk Study Photograph 5</b></p>	
<p><b>Date:</b> 04/12/20</p>	
<p><b>Direction Photograph Taken:</b> Looking south</p>	
<p><b>Description:</b> Southern boundary marked by wooden fence</p>	

<p><b>Desk Study Photograph 6</b></p>	
<p><b>Date:</b> 04/12/20</p>	
<p><b>Direction Photograph Taken:</b> Looking west</p>	
<p><b>Description:</b> General nature of the site, overgrown and wooded.</p>	



<p><b>Desk Study Photograph 7</b></p>	
<p><b>Date:</b> 04/12/20</p>	
<p><b>Direction Photograph Taken:</b> Looking east</p>	
<p><b>Description:</b> Stockpiled material (very soft clay).</p>	

<p><b>Desk Study Photograph 8</b></p>	
<p><b>Date:</b> 04/12/20</p>	
<p><b>Direction Photograph Taken:</b> Looking northwest</p>	
<p><b>Description:</b> Noticeable footpath</p>	



<p><b>Desk Study Photograph 9</b></p>	
<p><b>Date:</b> 04/12/20</p>	
<p><b>Direction Photograph Taken:</b> Looking north</p>	
<p><b>Description:</b> Slight opening and track to the adjacent site</p>	

<p><b>Desk Study Photograph 10</b></p>	
<p><b>Date:</b> 04/12/20</p>	
<p><b>Direction Photograph Taken:</b> Looking west</p>	
<p><b>Description:</b> Slight clearing to the western boundary with stockpiles of clay</p>	



<p><b>Desk Study Photograph 11</b></p>	
<p><b>Date:</b> 04/12/20</p>	
<p><b>Direction Photograph Taken:</b> Looking east</p>	
<p><b>Description:</b> Site area to the western and northern boundary</p>	

<p><b>Desk Study Photograph 12</b></p>	
<p><b>Date:</b> 04/12/20</p>	
<p><b>Direction Photograph Taken:</b> Looking southwest</p>	
<p><b>Description:</b> Pond outside the site boundary</p>	



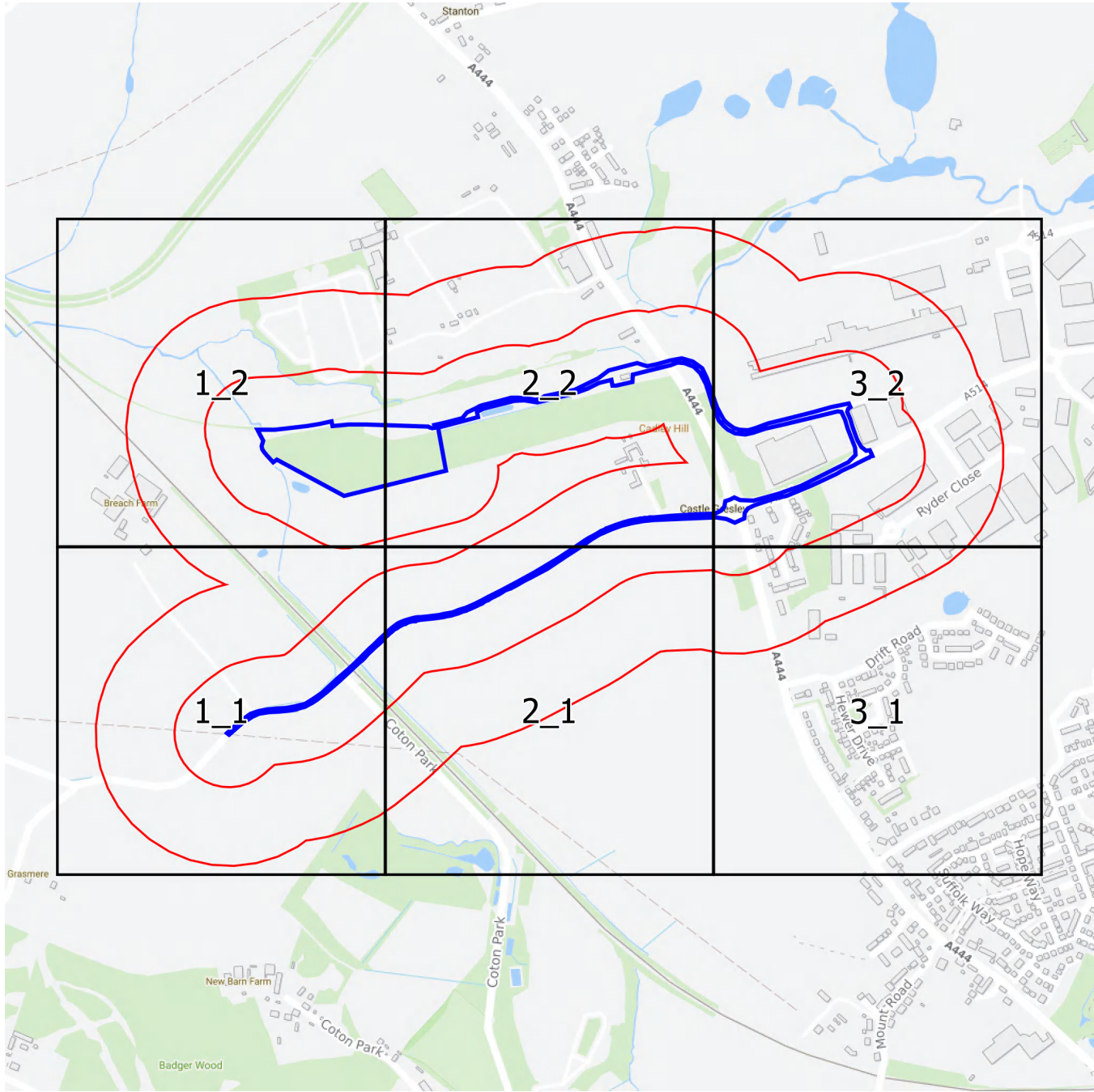
<p><b>Desk Study Photograph 13</b></p>	
<p><b>Date:</b> 04/12/20</p>	
<p><b>Direction Photograph Taken:</b> Looking west</p>	
<p><b>Description:</b> Wooded area to the west</p>	

<p><b>Desk Study Photograph 14</b></p>	
<p><b>Date:</b> 04/12/20</p>	
<p><b>Direction Photograph Taken:</b> Looking west</p>	
<p><b>Description:</b> Northern boundary to adjacent site</p>	

## Appendix C

# Historical Ordnance Survey Maps

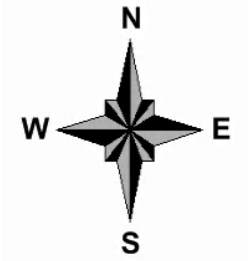




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**Site Details:**  
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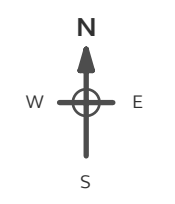
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**Map Name:** County Series

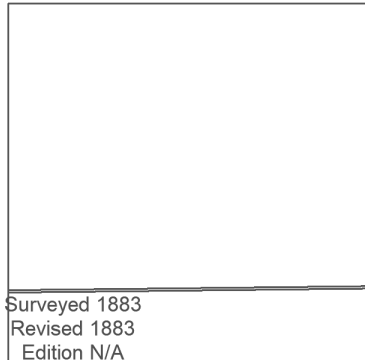
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**Scale:** 1:2,500

**Printed at:** 1:2,500



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Edition N/A  
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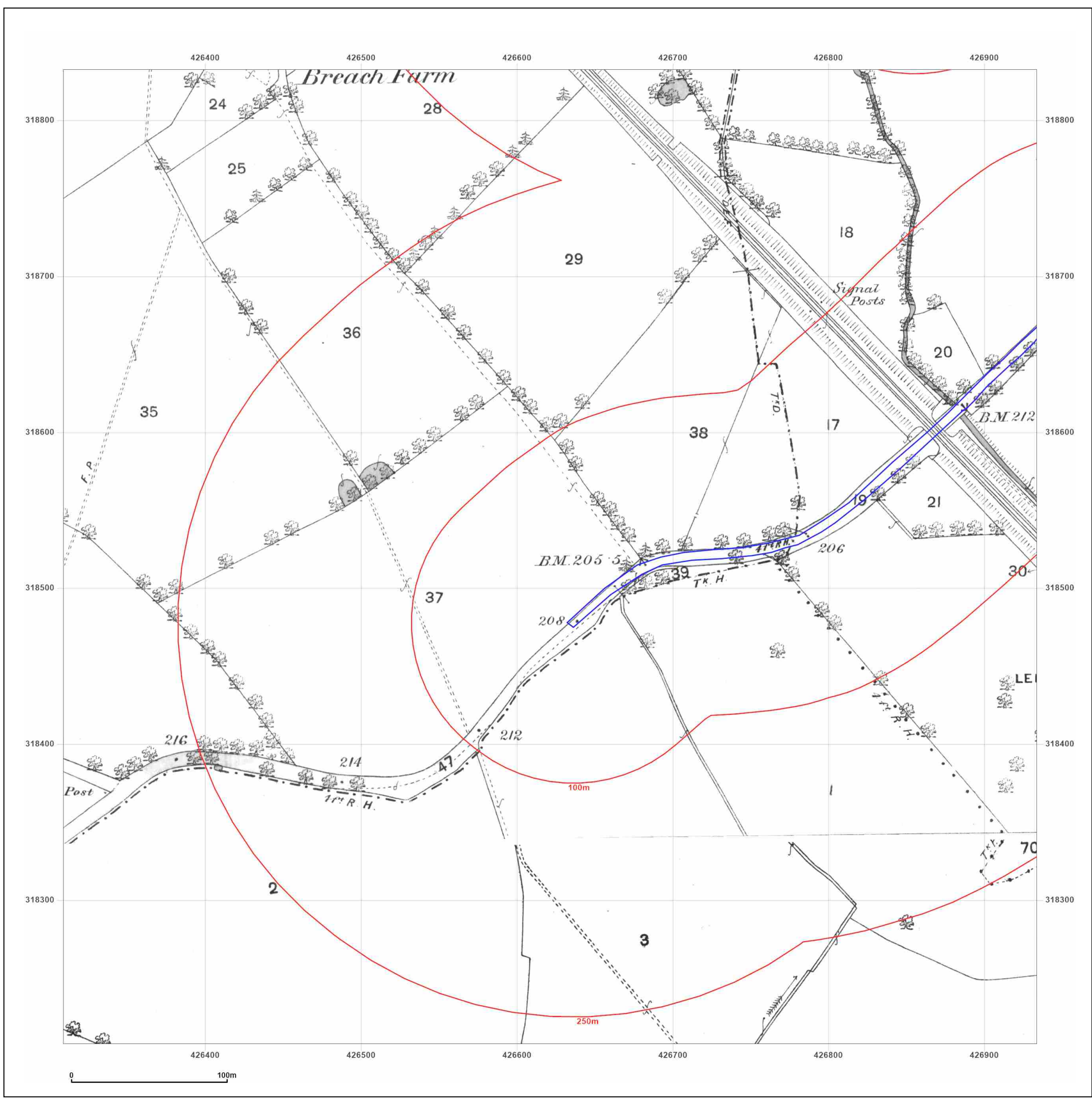
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**Site Details:**

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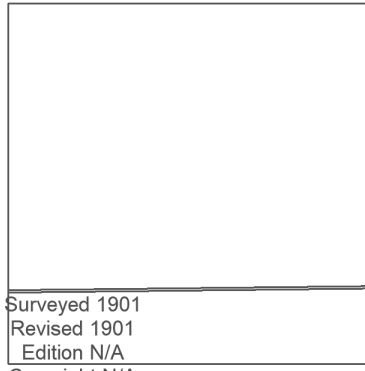
**Map date:** 1901

**Scale:** 1:2,500

**Printed at:** 1:2,500



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 Edition N/A  
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 Revised 1901  
 Edition N/A  
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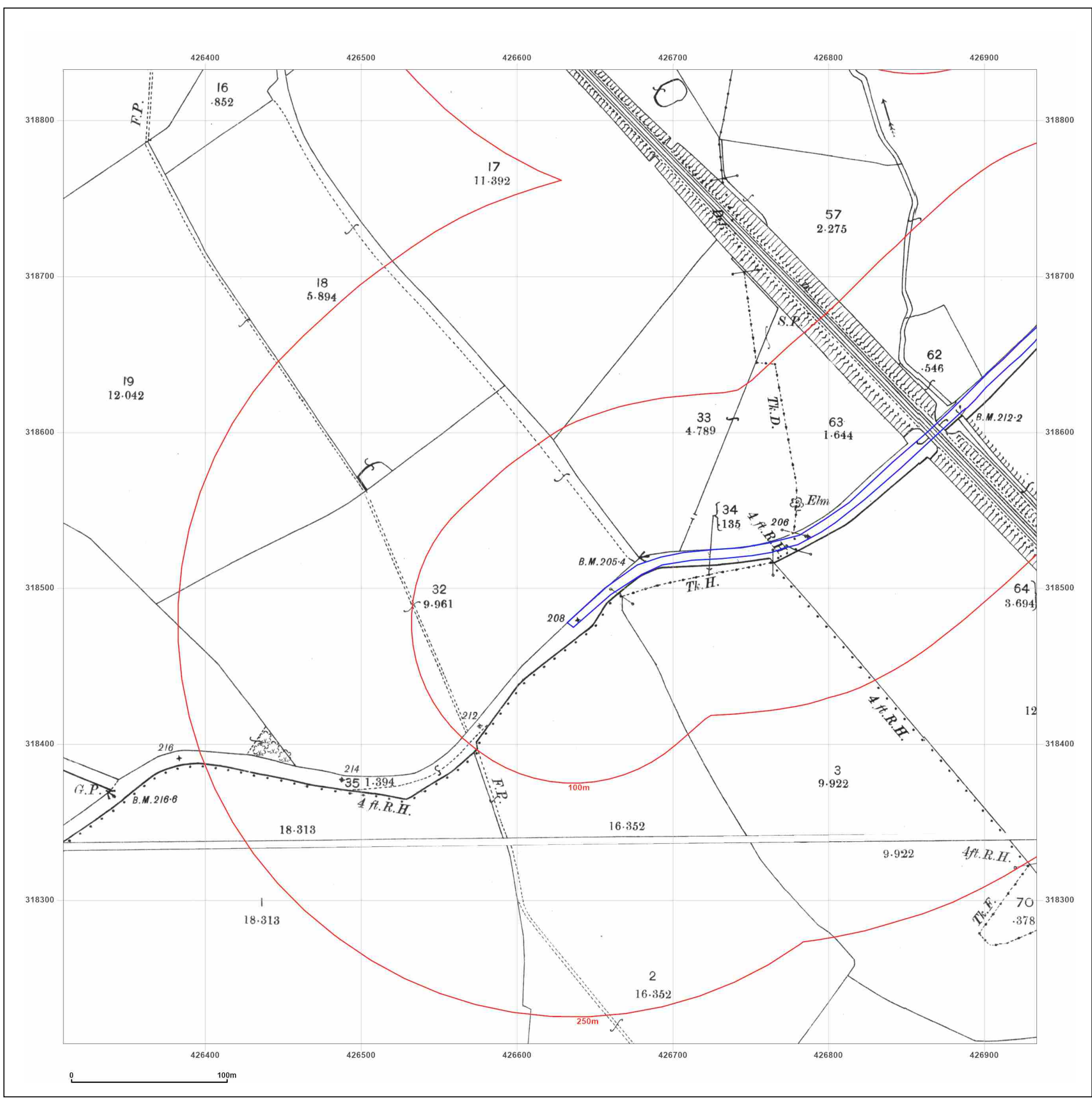


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**Site Details:**

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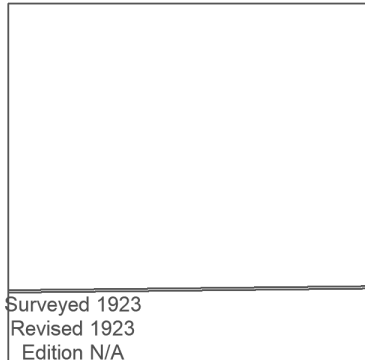
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**Printed at:** 1:2,500



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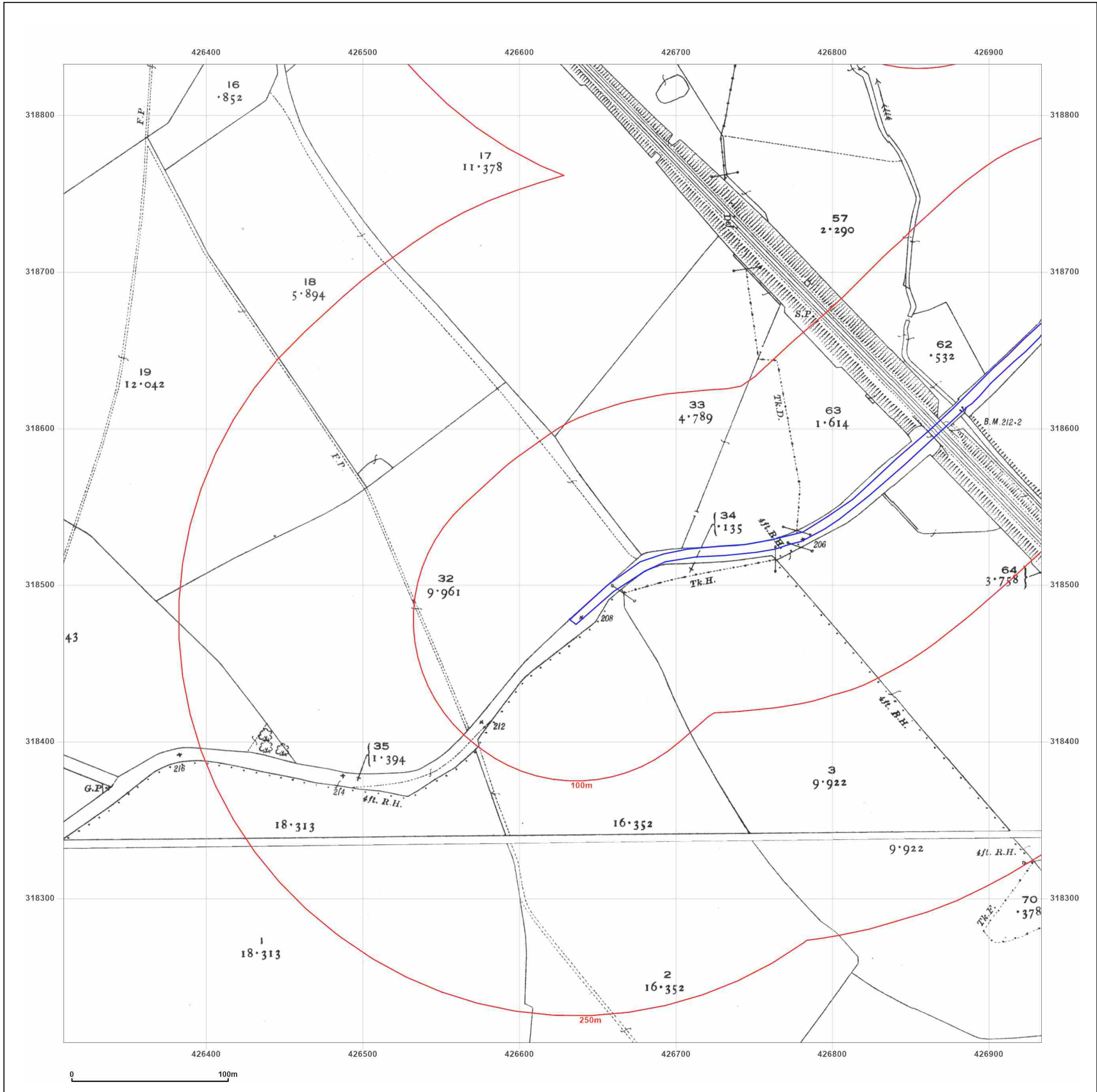


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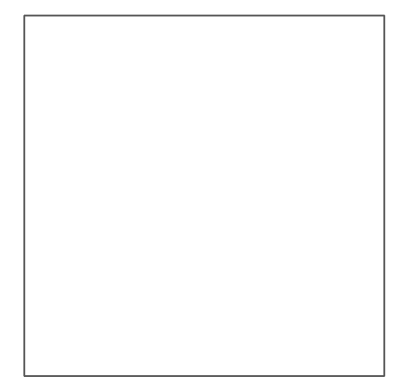
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**Map Name:** National Grid

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**Scale:** 1:2,500

**Printed at:** 1:2,500



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 Edition N/A  
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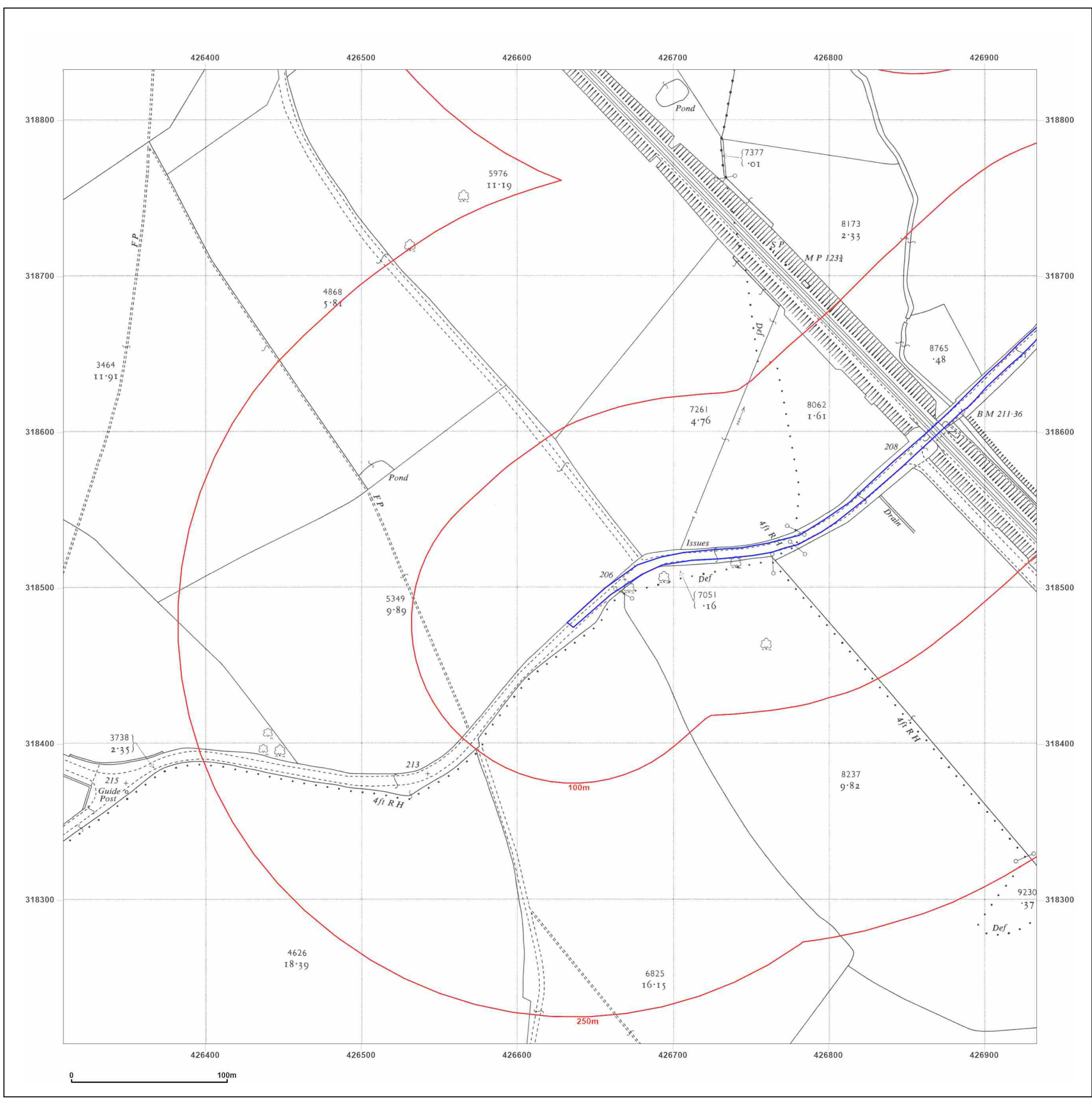


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**Report Ref:** HYD-8327960\_LS\_1\_1  
**Grid Ref:** 426621, 318520

**Map Name:** National Grid  
**Map date:** 1974  
**Scale:** 1:2,500  
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