

Paul Downing & Associates Ltd

H5 Site Condition Report for Tomlinson's Dairy, Unit D, Five Crosses Industrial Estate, Wrexham, LL11 3RD

Version 1.0

In support of Application Reference: PPN-00061

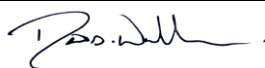
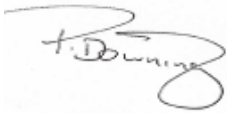
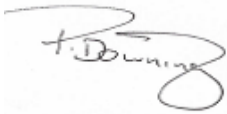
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1. Executive Summary

Paul Downing & Associates Ltd was commissioned to produce a site condition report (SCR) in support of a bespoke permit application PPN-00061 for Tomlinson's Dairy, Unit D, Five Crosses Industrial Estate, Wrexham, LL11 3RD under the Environmental Permitting Regulations 2014.

The aim of this report was to identify the baseline conditions with regards to soil and groundwater contamination by carrying out a site visit and review of literature and additional relevant data and reports.

The site is located in the Five Crosses Industrial Estate, 10km north west Wrexham in Wales. The surrounding land use is made up of a commercial and industrial properties and agricultural land the former great western railway line runs west of the site.

The site surface is made up of hard standing and there is a dedicated drainage system in place.

A review of the geology, hydrogeology, hydrology and environmental constraints such as SSSIs was carried out. The site has not had a long industrial past, remaining agricultural land up until the 1970s and, since then, the estate has undergone several phases of development. A ground investigation, reported in 2004, was also reviewed and its results incorporated in this report.

The site is located within 2km of two SSSIs and there are SACs and Ancient Woodlands in the surrounding area. The geology underlying the site is made up of Glacial Till overlying the Pennine Coal Formation, Unproductive Strata overlying a Secondary A Aquifer.

A source pathway receptor model was applied to understand the potential risks of processes on site to the environment based on the current land use and reported condition.

There is no evidence of widespread significant land contamination beneath this site based on the information collated for this report and the presence of hard standing, combined with low permeability geology, greatly reduces the potential for leaching. The report of 2004 did not indicate any soils contamination in excess of the Soil Guideline Values. The key potential risks identified in this report relate to fugitive liquid emissions escaping off site through the lagoon drainage system.

By implementing the correct environmental management systems on site the potential impacts associated with continued operation would not be considered significant.

This report has been produced solely for H5 SCR purposes of supporting a bespoke permit application PPN-00061 for Tomlinson's Dairy Ltd. Paul Downing & Associates Ltd is not liable for any other use of its contents other than those listed in this report nor for use by any other 3rd party other than Tomlinson's Dairy Ltd.

2. Introduction

1.1 Scope of Work

Paul Downing & Associates Ltd was commissioned to produce a site condition report (SCR) in support of bespoke permit application PPN-00061 for Tomlinson's Dairy, Unit D, Five Crosses Industrial Estate, Wrexham, LL11 3RD under the Environmental Permitting Regulations 2014.

The aim of this report was to identify the baseline conditions with regards to soil and groundwater contamination by carrying out a site visit and review of literature and additional relevant data and reports.

1.2 Background

The Client has requested that a bespoke permit application be submitted for the area of land identified in Figure 1, Annex A.

The report has been written in accordance with the Natural Resources Wales's H5 guidance for producing an SCR and comprises a site walkover, review of previous reports, Groundsure data (GS3343997) and involved discussions with the Natural Resources Wales. This report has also been completed in accordance to BS 10175:2011 – "Investigation of Potentially Contaminated Sites", code of practice and CLR 11 – "model procedures for the management of contaminated land".

The work undertaken for this SCR comprises:

- a site walkover assessment;
- a review of the historical land uses associated with the site to assess the potential for ground contamination;
- a review of the environmental setting to assess the sensitivity of the surrounding environment to contamination/pollution;
- consultation with the regulatory authorities to establish whether there are any significant environmental issues that may impact upon the site;
- a review of the "Groundsure" Site check report dated 03/10/2016 ref GS3343997; and
- A review of additional publically and commercially available reports and data sets.

The environmental risk assessment presented within this report has been prepared having regard to the source-pathway-receptor model introduced under Part IIA of the Environmental Protection Act 1990 and associated guidance on contaminated land published by the Department of Environment, Food and Rural Affairs. The methodology is essentially a qualitative assessment based on the identification and evaluation of potential 'source-pathway-receptor pollutant linkages'. On the basis of this risk assessment, consideration has been given to the potential for the site to be designated as 'contaminated land' (under the local authority contaminated land inspection strategy) as defined in Part IIA of the Environmental Protection Act 1990.

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A statement of limitations is presented at the end of this report.

2 Site Setting

2.1 Site Location

The site is situated at Unit D of the Five Crosses Industrial Estate 10km north west of Wrexham on the outskirts of Coedpoeth east of Minera.

The site is located at National Grid Reference: (SJ) 327762 352256 Unit D, Five Crosses Industrial Estate, Wrexham, LL11 3RD. The site is on a slope with a fall from west to east at an elevation of approximately 240 metres Above Ordnance Datum (mAOD) and covers an area of 3.98 Hectares.

The site boundary under consideration in this report is presented in Figure 1 in Annex A.

2.2 Surrounding Land Use

The surrounding land use is made up of a mix of industrial units and agriculture. The B5430 road to Southsea runs along the western and southern boundary of the industrial estate and the Gwernygaseg Road bounds the east of the estate. The industries and industrial facilities located in close proximity include:

- An electrical substation;
- Engineering Services;
- Bus and Coach Stations, Depots and Companies; and
- Fuel distributors and suppliers.

North of the site is agricultural land where there are pylons that convey power cables over the site from north east to south west.

2.3 Site Layout - Operations and Infrastructure

The site is an operational dairy that receives, heats and bottles milk prior to shipping via road haulage tankers. There are several buildings on site and it has undergone phases of extension in previous years. There are electrical substations, transformers and oils securely stored on site.

All drains inside the main buildings connect to foul water drainage and externally, rainfall and surface water, is directed to a surface water lagoon prior to discharging into a stream. The layout and drainage details are presented in Figures 2a to 2d. There are two Class II Oil Separators on site and a combined sewer that runs north to south across the eastern area.

All milk silos on site are bunded in accordance with Best Available Techniques guidance with high level alarms to prevent overfilling and automatic cut offs. Milk delivery lines are blown dry after each tanker delivery and the delivery bay can accept 4 tankers at one time.

All Cleaning In Place (CIP) systems are directed to foul water under a trade effluent discharge consent with Welsh Water.

3 Site History

The site is located under the Wrexham County Borough Council Planning Authority¹ and a review of planning applications and historical maps of the site are described below and presented in Annex C.

3.1 Planning History

There are 21 records of planning applications associated with the postcode LL11 3RD and the most recent ten are shown below in table 3.1.

Table 3.1 Planning History based on LL11 3RD

| Application Description | Location | Reference |
|---|--|------------------|
| Phase 3 - Extension Of Existing Blow Moulding Building And Associated Landscaping | Tomlinsons Dairies Five Crosses Industrial Estate Minera Wrexham | P/2016/0740 |
| Phase 2 - Extension Of The Existing Main Dairy Building To Provide Additional Cold Storage, Trolley Return And Packaging Storage, Replacement Of Existing Raw Milk Silos, Extension To Existing Hardstanding To Facilitate Hgv Circulation, Manoeuvring An | Tomlinsons Dairies Five Crosses Industrial Estate Minera Wrexham | P/2016/0739 |
| Erection Of Building For Tyre Fitting And Storage (Adjoining Sub Station) | Unit 26 Five Crosses Industrial Estate Minera Wrexham | P/2016/0705 |
| Phase 1 - Extension To The Main Dairy Building To Provide Additional Cold Storage, Trolley Return And Office Accommodation And Extension To Existing Hardstanding To Facilitate Vehicle Circulation, Vehicle Manoeuvring And Temporary Parking Spaces For | Tomlinsons Dairies Five Crosses Industrial Estate Minera Wrexham | P/2016/0646 |
| Application For Prior Approval For The Siting And Appearance Of Proposed Telecommunications Installation Upgrade And Associated Works | Telecommunications Mast Ruthin Road Minera Wrexham | P/2016/0543 |
| Relaxation Of Condition No 1 Imposed Under Planning Permission P/2011/0339 To Allow A Further Five Years For Development To Be Commenced (Erection Of 3 No Buildings Containing 11 No Two Storey Class B1, B2 And B8 Office / Workshop Units With Associated Ac | Land At Minera Building Supplies Five Crosses Industrial Estate Minera Wrexham | P/2016/0391 |
| Erection Of Building To Allow Under Cover Parking Of Coaches | Units 7 To 8 Five Crosses Industrial Estate Minera Wrexham | P/2016/0028 |
| Application For Approval Of Details Reserved By Conditions Imposed Under Planning Permission P2015/0377:Condition 8 - Submission Of A Management Plan To Consider Proposed Outdoor Working Practices In Relation To Controlling Potential Sources Of Noise An | Tomlinsons Dairies Five Crosses Industrial Estate Minera Wrexham | P/2015/0911 |
| Erection Of Canopy To Provide New Spray Booth And Associated Plant Booth | Auto Kraft Unit 35A Five Crosses Industrial Estate Mkinera Wrexham | P/2015/0553 |
| Erection Of Single Storey Section Building (12.235 M Long X 6.055 M Wide) To Be Used As Ancillary Offices In Connection With 34 Five Crosses Industrial Estate | Armon Limited Unit 34 Five Crosses Industrial Estate Minera Wrexham | P/2015/0539 |

Four of the most recent planning applications associated with this postcode are in relation to the Dairy itself.

¹<http://planning.wrexham.gov.uk/Planning>

3.2 Historical Mapping

Historical maps have been collated dating back to 1872 and these are presented in Annex C.

Based on the historical maps a summary of the site's key development over time is given in Table 3.2:

Table 3.2: Summary of key developments shown in historical maps

| Date | Key Features |
|-------------|--|
| 1872 | The site is made up of agricultural fields with the Wrexham and Minera branch of the Great Western Railway passing west of the site. There is a small pond on site and drainage is managed by ditches at field boundaries. |
| 1900 | This map shows an old shaft south of the site and remnants of former works. |
| 1962 | The fields in the north are shown on the mapping as marshland. |
| 1976 | There is no development or changes on site until the 1976 map that shows the existing power cables and pylons crossing the site. |
| 1989 | The old shaft and remnants of workings are no longer shown on and have been covered by the trading estate. |
| 2010/2014 | The site remains unchanged and undeveloped until the 2014 map that shows two buildings in the south west corner of the site on the northern boundary of the Five Crosses Industrial Estate. |

Other than the development of the trading and industrial estate in the 1970s there has been very little development on or near the site throughout its history.

4 Environmental Setting

4.1 Geology

The geology has been determined from the British Geological Survey Map App² and the Groundsure Report (Annex D) which is derived from the BGS 1:50,000 Digital Geological Map of Great Britain.

The geology on site is made up of superficial deposits overlying bedrock. The superficial deposits are described as Till formed up to 2 million years ago in the Quaternary Period. These rocks were formed in cold periods with Ice Age glaciers scouring the landscape and depositing moraines of till with outwash sand and gravel deposits from seasonal and post glacial meltwaters.

The bedrock is the Pennine Lower Coal Measures Formation and Pennine Middle Coal Measures Formation (undifferentiated). These are sedimentary beds formed approximately 309 to 313 million years ago in the Carboniferous Period. Deposition occurred in swamps, estuaries and deltas and these rocks were formed in marginal coastal plains with lakes and swamps periodically inundated by the sea; or estuaries and deltas and shallow seas.

A nearby borehole located at NGR (SJ) 327590 352010 drilled in 1977 encountered 16.5m of Glacial Till and was abandoned due to slow progress. No groundwater was encountered during drilling this borehole.

4.2 Hydrology & Surface Water Features

There are 18 Detailed River Networks located within 500m of the site and these are mainly associated with the on site and nearby network of drains, classified as Tertiary Rivers. The closest Primary River is River Gwenfro 192m north east of the site.

² <http://mapapps.bgs.ac.uk/geologyofbritain/home.html>

There are no surface water abstractions licensed within 2000m of the site and no biological or chemical monitoring data sets. The surface water features identified in Annex D are shown in Figure 3.

4.3 Hydrogeology

Based on the Groundsure data the site is underlain by Unproductive Strata overlying a Secondary A Aquifer. The aquifers are designated based on their perceived vulnerability and Unproductive Strata, relating to the Glacial Till, consists of deposits with low permeability that have negligible significance for water supply or river base flow.

Secondary A aquifers, represented by the Pennine Coal Measures, are made up from Permeable layers capable of supporting water supplies at a local rather than strategic scale, in some cases, forming an important source of base flow to rivers.

The soils on site are considered to have a low leaching potential meaning pollutants are unlikely to penetrate the soil layer because water movement is impeded by the low permeability of the geology and/or has the ability to attenuate diffuse pollutants.

There are two historical groundwater abstraction licences located between 848 and 1173m south west of the site. They were both used for potable water supply and were licensed to Dee Valley Water Plc.

The site does not lie in any Source Protection Zones at surface or at depth beneath the confining layer of Glacial Till. Groundwater flow direction in the Pennine Formation is not known however it is likely to be driven by the geometry of the bedding planes.

4.4 Flood Risk

Surface Water Flooding

The site is not located within Natural Resources Wales' designated Flood Zones. The Natural Resources Wales RoFRaS database provides an indication of river and coastal flood risk at a national level on a 50m grid with the flood rating at the centre of the grid calculated. The data considers the probability that the flood defences will overtop or breach by considering their location, type, condition and standard of protection.

The RoFRaS flood rating for the site is *Very Low*.

Groundwater Flooding

The BGS has identified groundwater flooding susceptibility areas within 50m from the boundary of the site and these relate to clear water. Further information is presented in Section 7.7 of Annex D and there is limited potential for groundwater flooding with a high confidence rating. Where limited potential for groundwater flooding to occur is indicated, this means that although given the geological conditions there may be a groundwater flooding hazard, unless other relevant information, e.g. records of previous flooding, suggests groundwater flooding has occurred before in this area, there is no need to take action in relation to the groundwater flooding hazard.

4.5 Environmental Sensitivity

Based on the information provided in the Groundsure report there are two Sites of Special Scientific Interest (SSSIs) within 2000m of the site. These both relate to the Ruabon/Llantysilio mountains and Minera 1225 and 1657m west of the site. There are also three Special Areas of Conservation (SACs)

all beyond 1300m from the site and located in the Berwyn a Mynyddoedd De Clwyd / Berwyn and South Clwyd Mountains south west and west.

There are 48 records of Ancient Woodlands within 2000m and an Area of Outstanding Natural Beauty (AONB) Bryniau Clwyd a Dyffryn Dyfrdwy/Clwydian Range and Dee Valley is 878m south west of the site.

The site is not located within 2000m of any of the following designations:

- National Nature Reserves (NNRs);
- Local Nature Reserves;
- World Heritage Sites;
- National Parks (NPs);
- Nitrate Sensitive Areas (NSAs) and Nitrate Vulnerable Zones (NVZs); or
- Green Belt.

The environmental designations are shown in Figure 4 and Section 8 of Annex D.

5 Previous Reporting

A ground investigation was carried out on the site as part of the new dairy development. It was undertaken by Mark Dady Associates and was reported in February 2004 (Report No' 457).

The purpose of the investigation was to ascertain the nature and structure of the near surface soils to understand the environmental and geotechnical properties. Four 150mm cable percussive boreholes were progressed to a maximum depth of 10m below ground level and samples collected for laboratory analysis. A series of geotechnical testing was also carried out and the report is presented in Annex C.

The boreholes did not reach bedrock and remained in the superficial Till deposits. Groundwater was only encountered in one borehole (BH02) at a depth of 1.0m below ground level, this is not anticipated to reflect natural groundwater levels beneath the site.

Soil samples were collected from a depth of 0.5mbgl and analysis of a basic contamination suite was undertaken by ALcontrol Geochem Analytical Services. The results are presented in Annex C and are reported as below Soil Guideline Values (SGVs) for Commercial/Industrial land use.

6 Regulatory Setting

6.1 Environmental Permits

There are no Integrated Pollution Control (IPC) Authorisations issued within 500m of the site or IPPC Activities.

Three records of Part A(2) and Part B Activities and Enforcements within 500m exist and these relate to one Mineral Process and two Waste Oil Burning Processes, 88m, 123m and 174m south west and south of the site respectively.

In addition to above there is a Discharge Consent associated with treated sewage effluent from Barn A & B, Gwern y Gaseg Farm 358m north of the site. There are no further records of environmental permits of regulatory controls in the vicinity of the site.

6.2 Landfill and Waste Licences

Four historic landfills have been identified within 1500m of the site and one Local Authority Landfill site, these are all beyond 500m of the site.

The closest, Pentre Saeson Foundry 735m north, last received industrial waste in December 1985.

There are records of five waste treatment, transfer, disposal or metal recycling sites within 1500m of the site, the closest being the Household, Commercial and Industrial Waste Transfer Station at Station House, Old Road, 181m south west of the site.

The waste sites within 500m are shown on Figure 5 in Annex A.

6.3 Records of Pollution Incidents

Pollution incidents are recorded by the Natural Resources Wales on the National Incident Recording System (NIRS) and given a category rating based on their severity of impact caused to water, land and air. There has been one record of a List 2 incident within 500m of the site and no records of the more severe List 1.

The incident, recorded 489m south east of the site, was on the 13 March 2003 and related to sewage materials that had a minor impact on water and no impact on land or air.

6.4 Petroleum Licences

There are no records of petrol, fuel sites or underground high pressure oil and gas pipelines within 500m of the site.

6.5 Coal Mining and Other Resources

The site is within 75m of an identified mining area, the area is known for coal and, based on the local geology, the British Geological Survey (BGS) have identified that the area may have been used to recover Iron Ore (Bedded).

Further details relating to the nature of potential extraction are beyond the scope of this document however, for further information, there are details in Section 10.0 of Annex D.

7 Environmental Risk Assessment

7.1 Risk Assessment Framework

The following environmental risk assessment has been prepared having regard to the source-pathway-receptor model introduced under Part IIA of the Environmental Protection Act 1990 and associated guidance on contaminated land published by the Department of Environment, Food and Rural Affairs.

The methodology is essentially a qualitative assessment based on the identification and evaluation of potential 'source-pathway-receptor pollutant linkages'.

An Environmental Risk Assessment involves assessing the likely probability and consequence of a Pollutant Linkage existing and determining a consequent level of risk. A pollutant linkage will only be present where the sources pathways and receptors are all present. For a risk to exist all three of the following components must be present:

- **Source** of contamination;
- **Pathway** for the contaminant to move from source to receptor; and

- **Receptor** that could be affected by the contaminant.

The following sections identify the sources, pathways and receptors present on site and assess the potential linkages.

7.2 Potential Sources

The following table identifies the potential sources of contaminants on the site and qualitatively assesses their significance on a scale of 1 (Low) to 5 (High) versus the likelihood on a scale of 1 (Unlikely) to 3 (Very likely). The risk score is the product of the significance and likelihood has been categorised as follows:

- 1-4 = Low Potential Risk
- 5-10 = Medium Potential Risk
- 11-15 = High Potential Risk

Table 7.1: Potential Sources On Site

| ID | Potential Source | Potential Significance (1 Low 5 High) | Likelihood (1 Unlikely 3 Very Likely) | Risk Score |
|----|---|--|--|------------|
| 1 | Unidentified Historic/Legacy contamination in the sub surface | 2 | 1 | 2 |
| 2 | Hydrocarbons – Transformers, fuels, lubricants | 3 | 2 | 6 |
| 3 | Contaminated surface water – hydrocarbon, dairy products | 4 | 2 | 8 |
| 4 | Milk | 4 | 2 | 8 |

7.3 Potential Pathways

The following table identifies the potential pathways that have been assessed on site.

Table 7.2: Potential Pathways On Site

| ID | Potential Pathways |
|----|---|
| 1 | Subsurface drainage channels |
| 2 | Vertical leaching through the soils |
| 3 | Overland flow |
| 4 | Inhalation during excavation/wind blown |

7.4 Potential Receptors

The following table identifies the potential receptors that have been identified on site and in the surrounding area.

Table 7.3: Potential Receptors

| ID | Potential Receptors |
|----|---|
| 1 | Site employees at surface |
| 2 | Construction workers (excavation crews) |
| 3 | Surface water features including ecosystems |

7.5 Potentially Complete SPR Linkages

By combining the information in the source pathway receptor tables the potentially complete linkages have been assessed and are shown in Table 7.4. There are a total of 12 potentially complete

linkages however this is considered extremely conservative as no significant impacts have been identified on site and there are very few likely receptors. Current processes are not considered to have led to significant impacts.

A summary of the key potentially significant linkages based on a medium risk score is given in Table 7.5:

Table 7.4: Review of all SPR Linkages identified on site

| | Potential Receptor | | | |
|--------------------------|--|--|--|--|
| | | <i>Site employees at surface</i> | <i>Construction workers (excavation crews)</i> | <i>Surface water features including ecosystems</i> |
| Potential Sources | Unidentified Historic/Legacy contamination in the sub surface | Dermal Contact ingestion/inhalation | Dermal Contact ingestion/inhalation | Leaching from Glacial Till into surface water drainage channels |
| | Hydrocarbons – Transformers, fuels, lubricants | Inhalation of vapours | Dermal Contact and ingestion Inhalation | Overland runoff |
| | Contaminated surface water – hydrocarbon, dairy products | Inhalation Dermal Contact and ingestion | Dermal Contact and ingestion Inhalation | Overland runoff, connection with lagoon direct to discharge stream |
| | Milk | NA | NA | Overland runoff, connection with lagoon direct to discharge stream |
| | | | | |

Table 7.5: Summary of Medium Risk SPR Potential Linkages identified on site

| Source | Pathway | Receptor | Risk | Rationale |
|---|--|---|-------------|--|
| Contaminated surface water – hydrocarbon, dairy products | Overland runoff, connection with lagoon direct to discharge stream | Surface Water Features Including Ecosystems | Medium | Contaminated water has the potential to enter the environment by passing through the lagoon and discharging into the surface water stream. In the event of a catastrophic loss on site the stream could be at risk. |
| Milk | Overland runoff, connection with lagoon direct to discharge stream | Surface Water Features Including Ecosystems | Medium | Milk has a high Biological Oxygen Demand (BOD) and can be very harmful to the environment. Contaminated water has the potential to enter the environment by passing through the lagoon and discharging into the surface water stream. In the event of a catastrophic loss on site the stream could be at risk. |

8 Conclusion & Recommendations

8.1 Conclusions

Overall the site would be given a classification of low risk with the exception of two medium potentially complete source, pathway and receptor linkages. The site has not had a long industrial past and the soil investigation reported in 2004 (Annex C) does not indicate the presence of contaminant concentrations in excess of SGVs. Soils conditions beneath the site are anticipated to be similar to those observed in the 2004 report.

The two key potentially complete the SPR linkages classified as medium risk are:

- Potential impacts on surface water through contaminated surface water drainage entering the discharge stream having passed through the lagoon; and
- Milk entering the stream as a result of a catastrophic spill.

The nature of the geology underlying the site means that any contamination, as a result of spills or historic legacies, would not migrate easily and therefore there is a low risk of any impacts being observed in groundwater at depth.

By implementing the correct environmental management systems on site the potential impacts associated with continued operation would not be considered significant.

8.2 Recommendations

The following recommendations have been made to enable the potential impacts of a completed SPR linkage to be reduced.

1. *Inspection and maintenance of hard standing*

Hard standing should be inspected on a regular basis to identify cracks and wear and tear. Where identified these should undergo maintenance and repair to maintain a low permeability surface reducing the potential of vertical migration into the sub surface. The hard standing minimises infiltration of precipitation and therefore reduce the risk of mobilising any unforeseen unidentified contamination in the sub surface; and

2. *Pollution Prevention Management Systems*

A pollution management system should be put in place (if not already existing) to ensure staff on site are able to manage a potentially environmentally damaging incident. A stop valve, if not already in place, should be installed on the discharge of the lagoon to prevent discharge in the event of a catastrophic loss of product. The pollution prevention management systems should include spill kits, bunding of all tanks where liquids are stored and training on control of the surface water drainage system.

9 Statement of Limitations

This report was prepared in accordance with the scope of work outlined within this report and is subject to the applicable cost, time and other constraints. Paul Downing & Associates Ltd performed the services on behalf of the Client in a manner consistent with the normal level of care and expertise exercised by members of the environmental profession. No warranties, expressed or implied, are made.

Except as otherwise stated, Paul Downing & Associates Ltd's assessment is limited strictly to identifying the specified environmental conditions associated with the subject Site and does not evaluate structural or geotechnical conditions of any part of the Site (including any buildings, equipment or infrastructure).

All conclusions and recommendations made in the report are the professional opinions of the Paul Downing & Associates Ltd personnel involved with the project and, while normal checking of the accuracy of data has been conducted, Paul Downing & Associates Ltd assumes no responsibility or liability for errors in data obtained from such sources, regulatory agencies or any other external sources, nor from occurrences outside the scope of this project.

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This report does not constitute legal advice.

10 Annexes

10.1 ANNEX A Figures

Figure 1 Site Boundary and Location

Figure 2a to 2d Site Layout & Drainage

Figure 3 Hydrology

Figure 4 Environmental Designations

Figure 5 Licensed Waste Sites

10.2 ANNEX B Photo Log

10.3 ANNEX C Historical Mapping & Previous Report

10.4 ANNEX D Groundsure Report

ANNEX A Figures

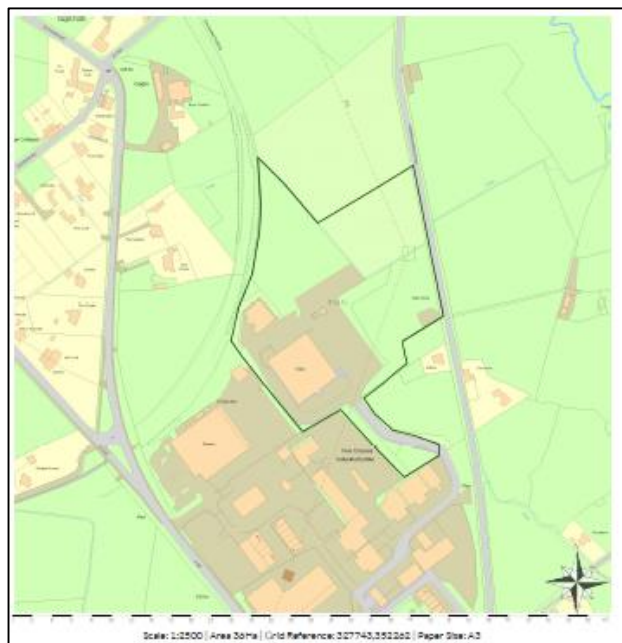
Figure 1 Site Boundary and Location

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Figure 3 Hydrology

Figure 4 Environmental Designations

Figure 5 Licensed Waste Sites



**Paul Downing
& ASSOCIATES LTD**

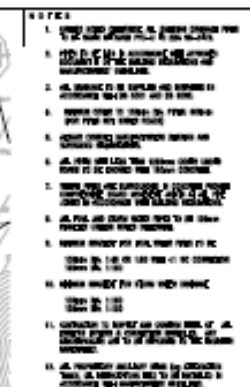
Figure 1 Site Location

Tomlinson's Dairy, UNIT D, FIVE
CROSSES INDUSTRIAL ESTATE,
WREXHAM, LL11 3RD

Reference: GS3343997

ABC all models were back indicated as appropriate
 20 service back in April 1999
 30 service back in April 1999

WBC of whole ear book index as appropriate



- | | |
|--|--|
| New Building Empire Zone 1 | |
| Existing Surface | |
| Existing Foot Overhead | |
| Existing SW challenge to be produced up | |
| Existing SW challenge to be produced up | |
| New Foot Structure CHV - existing structure down challenge into system | |
| New Foot Structure | |
| New Surface Structure | |

| | | | |
|---|----------|--|----|
| Q | 10.00.00 | See also 10.00.00 for the amount of the amount of the | LC |
| R | 10.00.00 | See also 10.00.00 for the amount of the amount of the | LC |
| S | 10.00.00 | See also 10.00.00 for the amount of the amount of the | LC |
| T | 10.00.00 | See also 10.00.00 for the amount of the amount of the | LC |
| U | 10.00.00 | See also 10.00.00 for the amount of the amount of the | LC |
| V | 10.00.00 | See also 10.00.00 for the amount of the amount of the | LC |
| W | 10.00.00 | See also 10.00.00 for the amount of the amount of the | LC |
| X | 10.00.00 | See also 10.00.00 for the amount of the amount of the | LC |
| Y | 10.00.00 | See also 10.00.00 for the amount of the amount of the | LC |
| Z | 10.00.00 | See also 10.00.00 for the amount of the amount of the | LC |

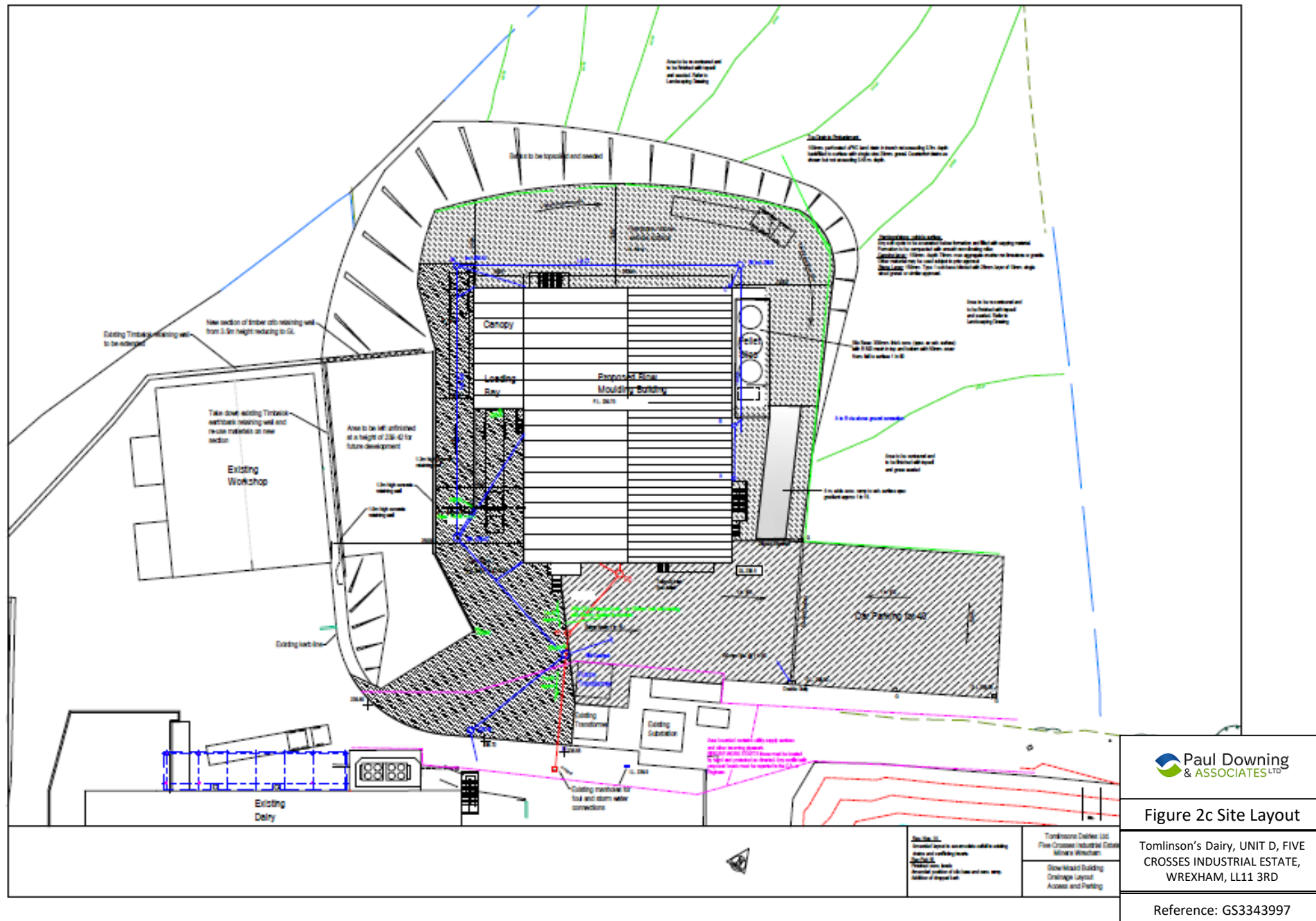
Haston Reynolds

PROJECT
Cold Store Extension
Fire Crosses Industrial
Estate Miners, Wrexham

DESCRIPTION
Proposed Drainage Layout
Phase 1

Figure 2a Site Layout

Tomlinson's Dairy, UNIT D, FIVE
CROSSES INDUSTRIAL ESTATE,
WREXHAM. LL11 3RD





Mapping
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Survey

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Site Outline
— 100 —
— 250 —
Search Buffers (m)

- | | | |
|--------------------------|---------------------------------|-------------------------|
| AONB | Green Belt | Ancient Woodland |
| National Park | Environmentally Sensitive Areas | National Nature Reserve |
| SSSI | Special Areas of Conservation | Local Nature Reserves |
| Special Protection Areas | World Heritage Sites | Ramsar Sites |
| Nitrate Vulnerable Zones | Nitrate Sensitive Areas | |

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Figure 4 Environmental Designations

Tomlinson's Dairy, UNIT D, FIVE
CROSSES INDUSTRIAL ESTATE,
WREXHAM, LL11 3RD










Reference: GS3343997



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- | | | | | | |
|---|---------------------------|---|---|---|----------------------------------|
|  | Site Outline |  | E.A. Active Landfill |  | Historic and Planned Waste Sites |
|  | E.A. Historic Landfill |  | E.A. Licensed Waste Site | | |
|  | BGS / DoE Survey Landfill |  | Local Authority/Historical Mapping Landfill Records | | |
-  250 Search Buffers (m)
 500

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Figure 5 Landfills

Tomlinson's Dairy, UNIT D, FIVE
CROSSES INDUSTRIAL ESTATE,
WREXHAM, LL11 3RD

Reference: GS3343997

ANNEX B Photo Log

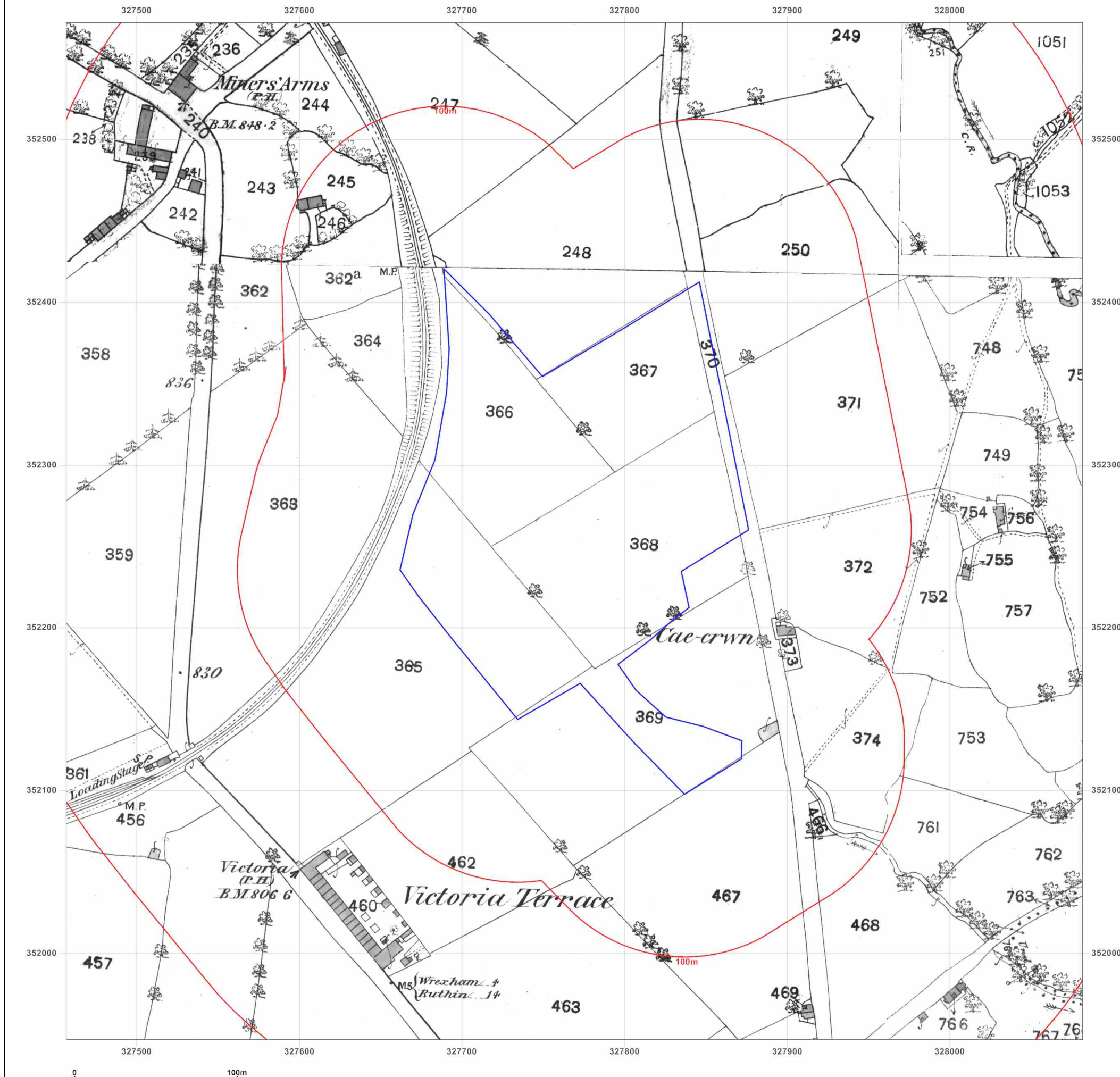
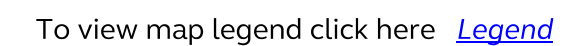


Photograph 1: Hard standing, carp parking and main building



Photograph 2: Lorries on site, reinforced concrete hard standing

ANNEX C Historical Mapping & Previous Report



Site Details:

UNIT D, FIVE CROSSES
INDUSTRIAL ESTATE,
WREXHAM, LL11 3RD

Client Ref: Tomlinsons_Dairy
Report Ref: GS-3343998
Grid Ref: 327769, 352259

Map Name: County Series

Map date: 1899

Scale: 1:2,500

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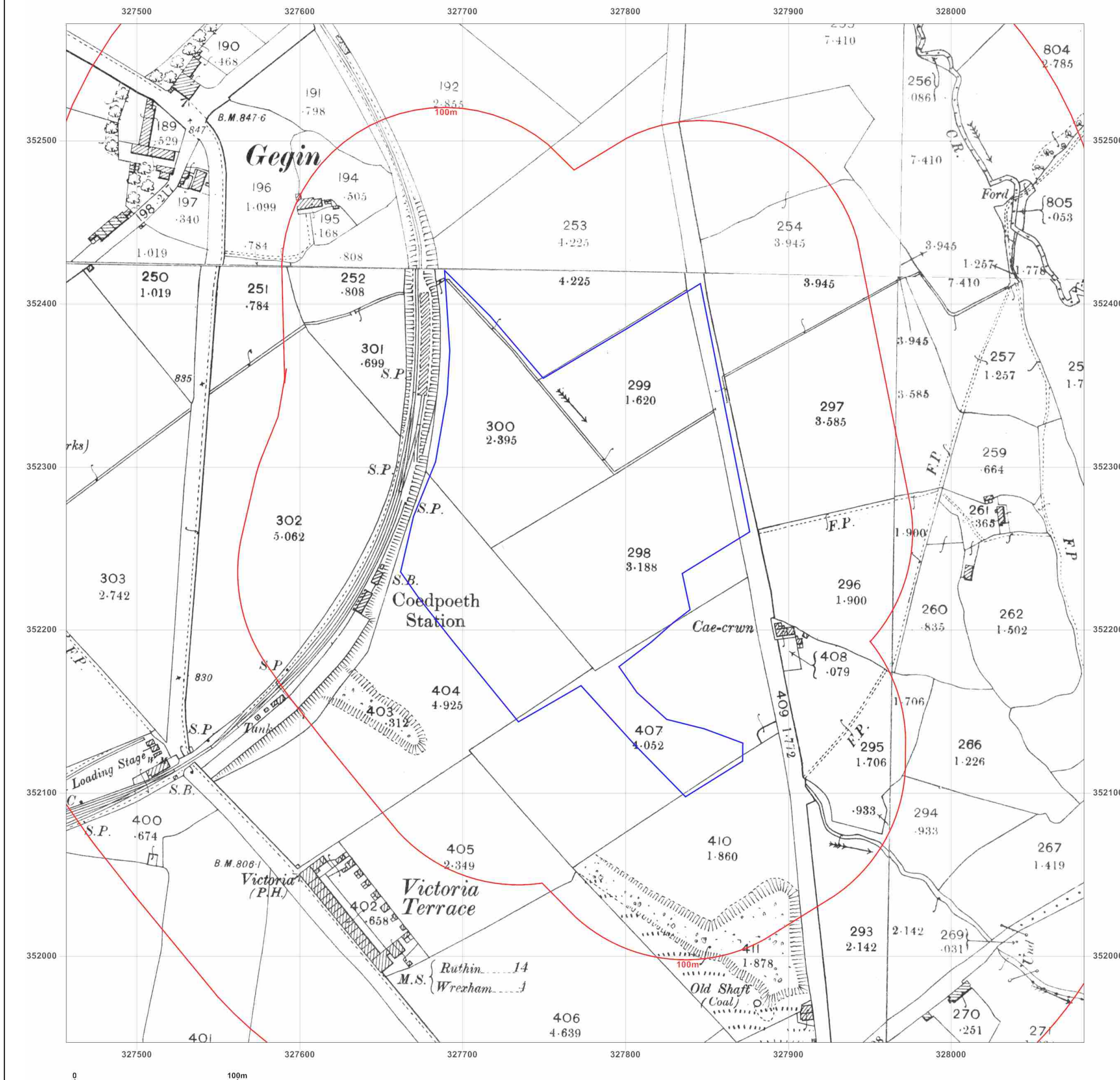


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Grid Ref: 327769, 352259

Map Name: County Series

Map date: 1912

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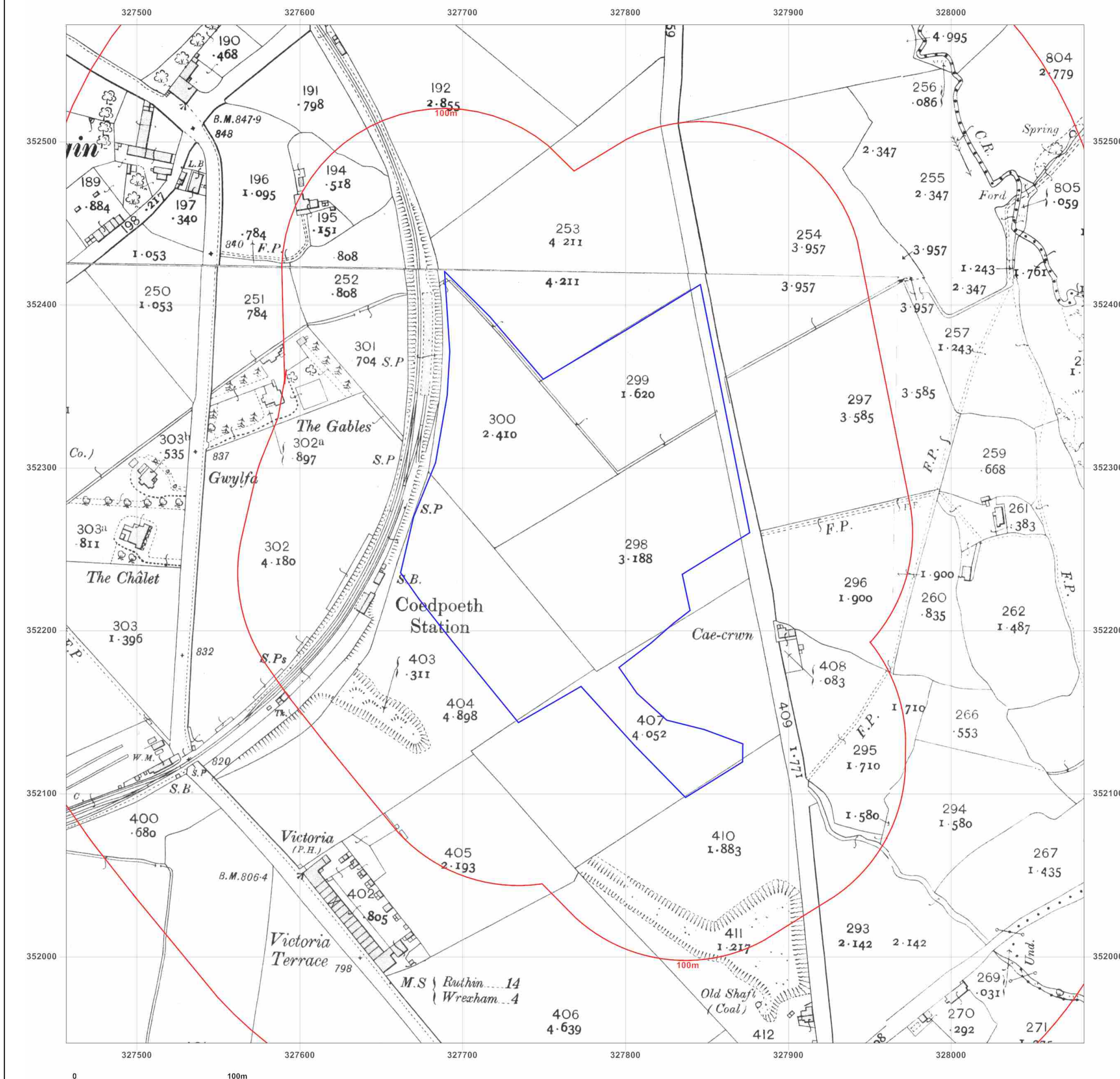


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Grid Ref: 327769, 352259

Map Name: National Grid

Map date: 1961-1962

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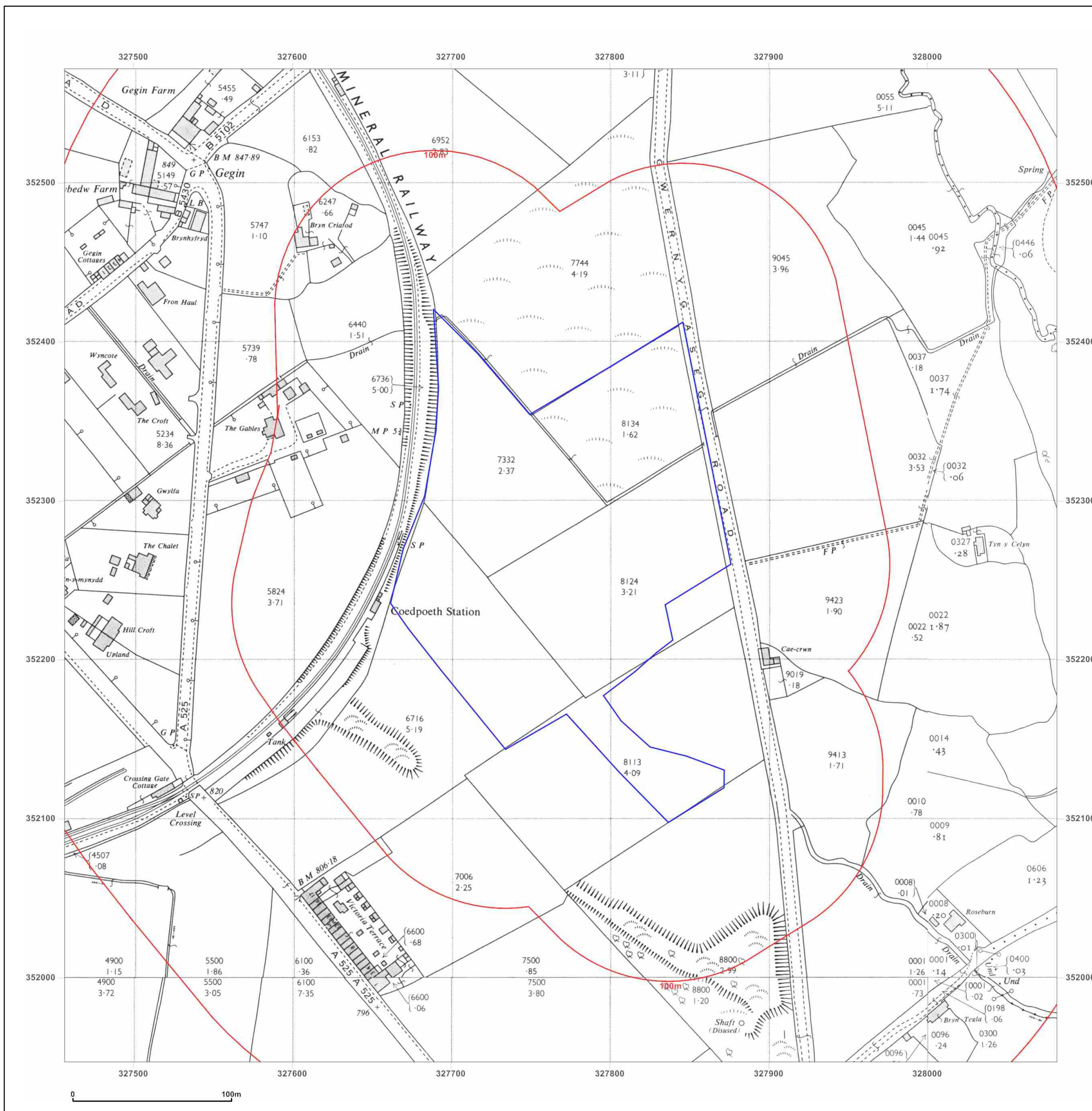


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Grid Ref: 327769, 352259

Map Name: National Grid

Map date: 1979-1984

Scale: 1:2,500

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Edition N/A
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Levelled 1959

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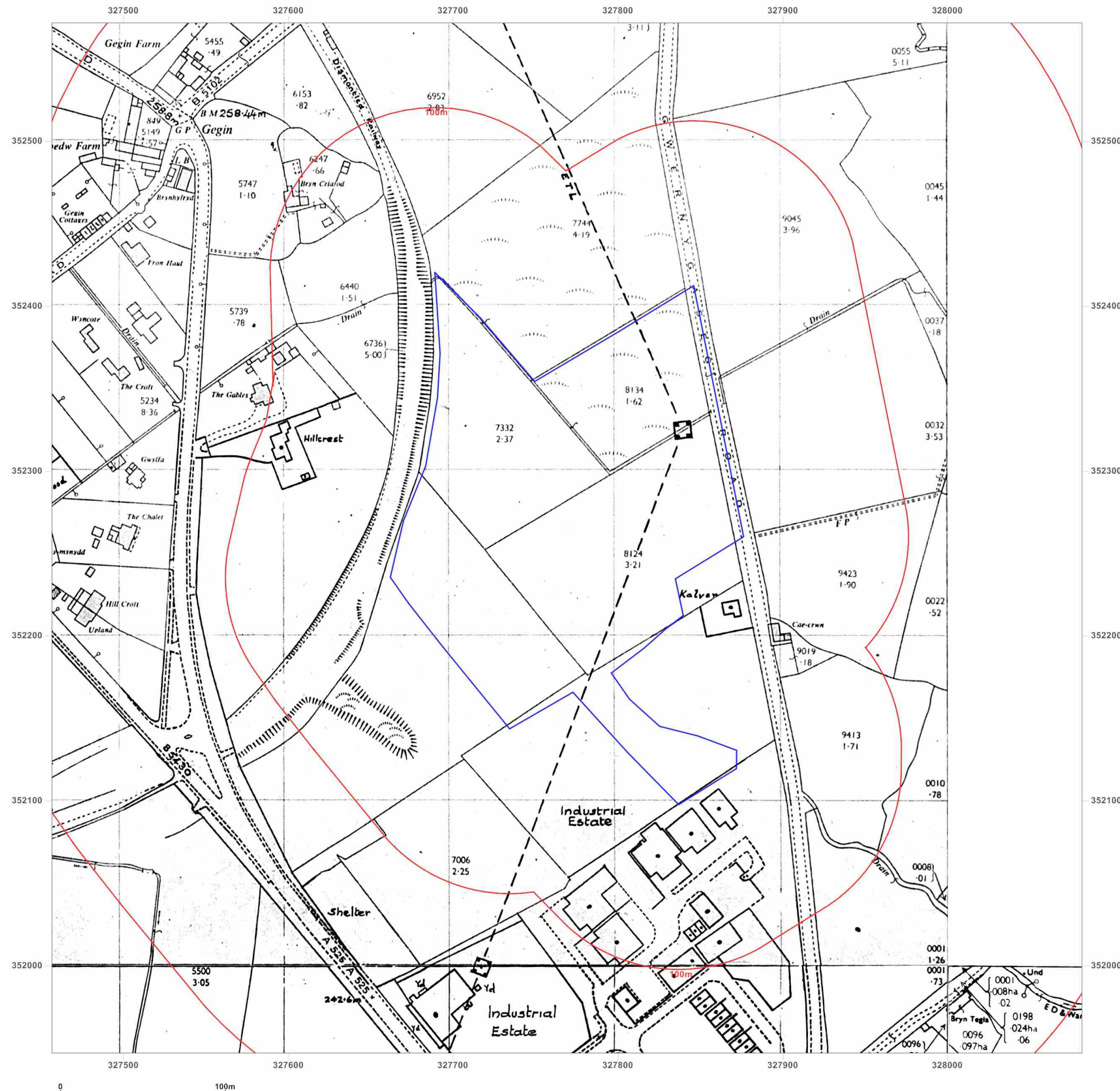


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Report Ref: GS-3343998
Grid Ref: 327769, 352259

Map Name: National Grid

Map date: 1993

Scale: 1:2,500

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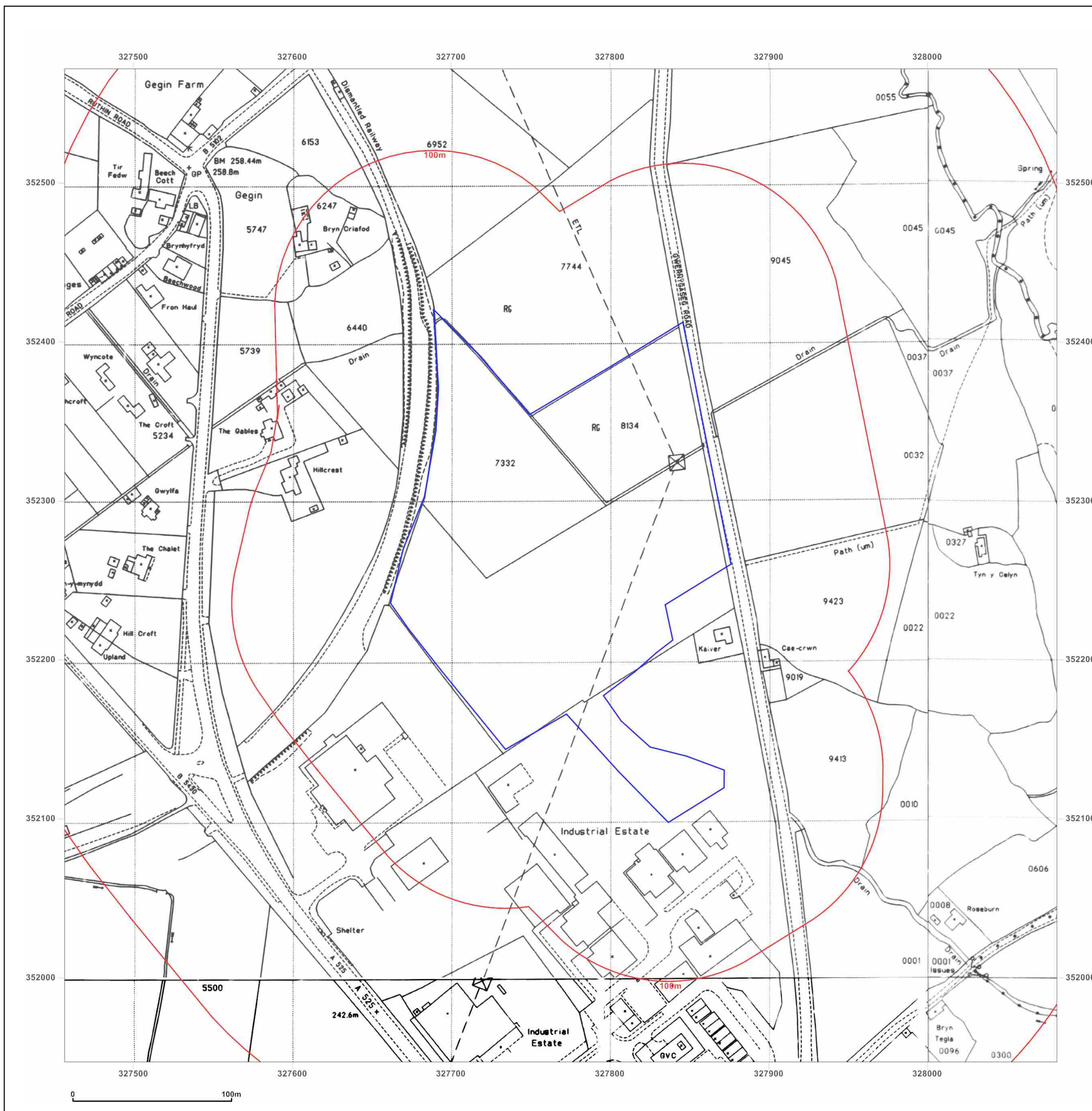


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Grid Ref: 327769, 352259

Map Name: County Series

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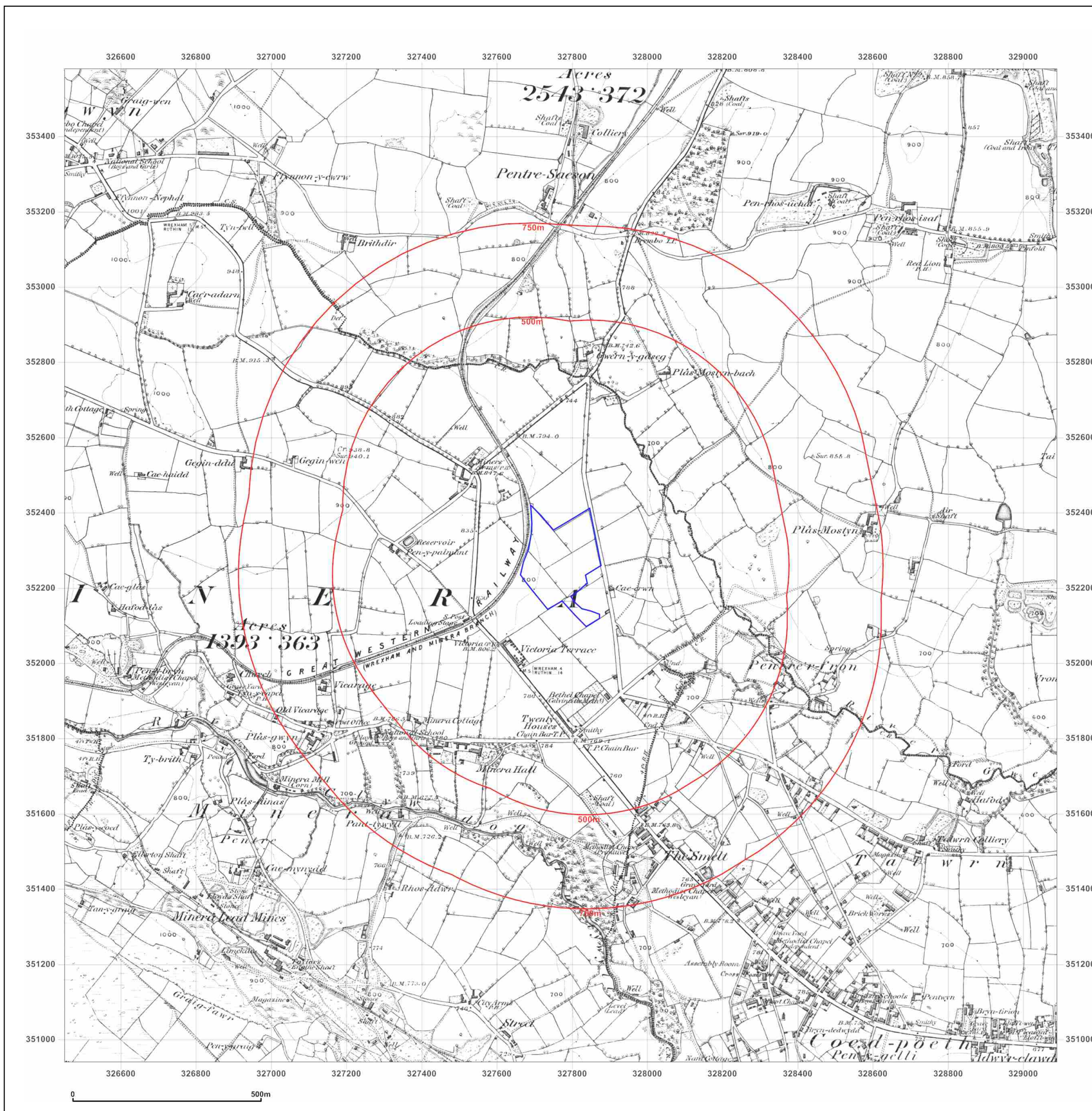


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Map Name: County Series

Map date: 1900

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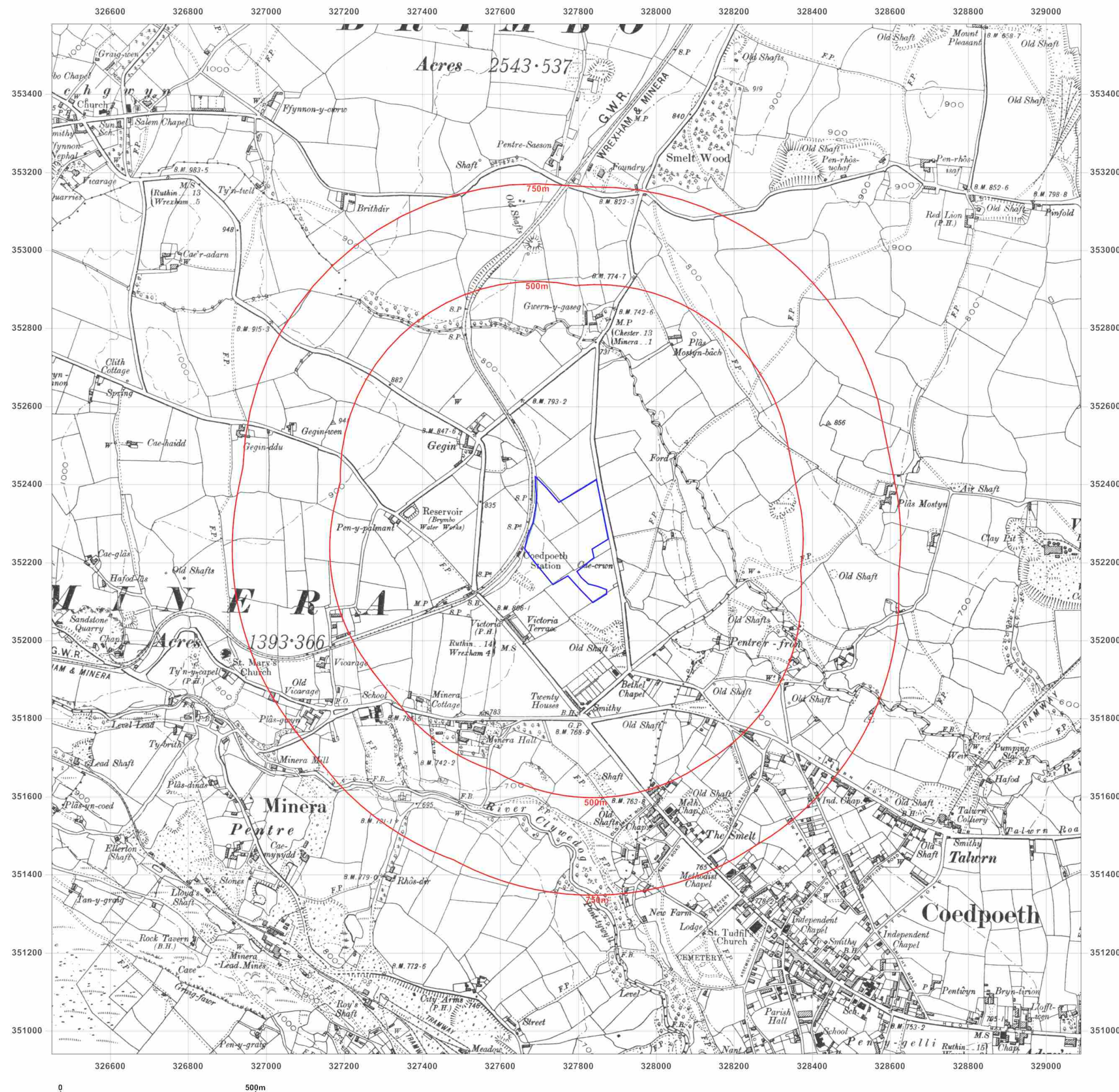


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Map Name: County Series

Map date: 1910

Scale: 1:10,560

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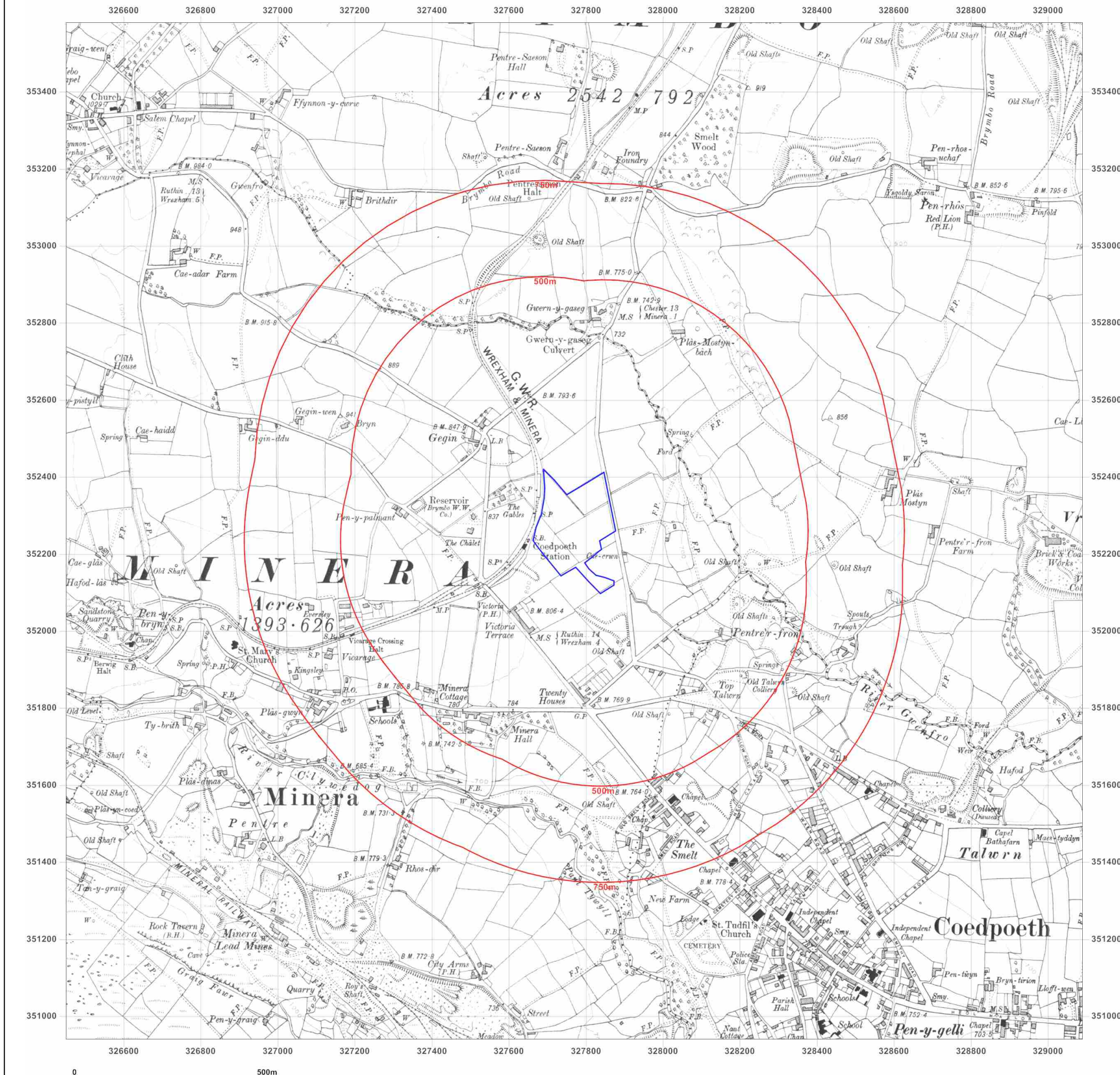


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Grid Ref: 327769, 352259

Map Name: County Series

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Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1871
Revised 1938
Edition 1938
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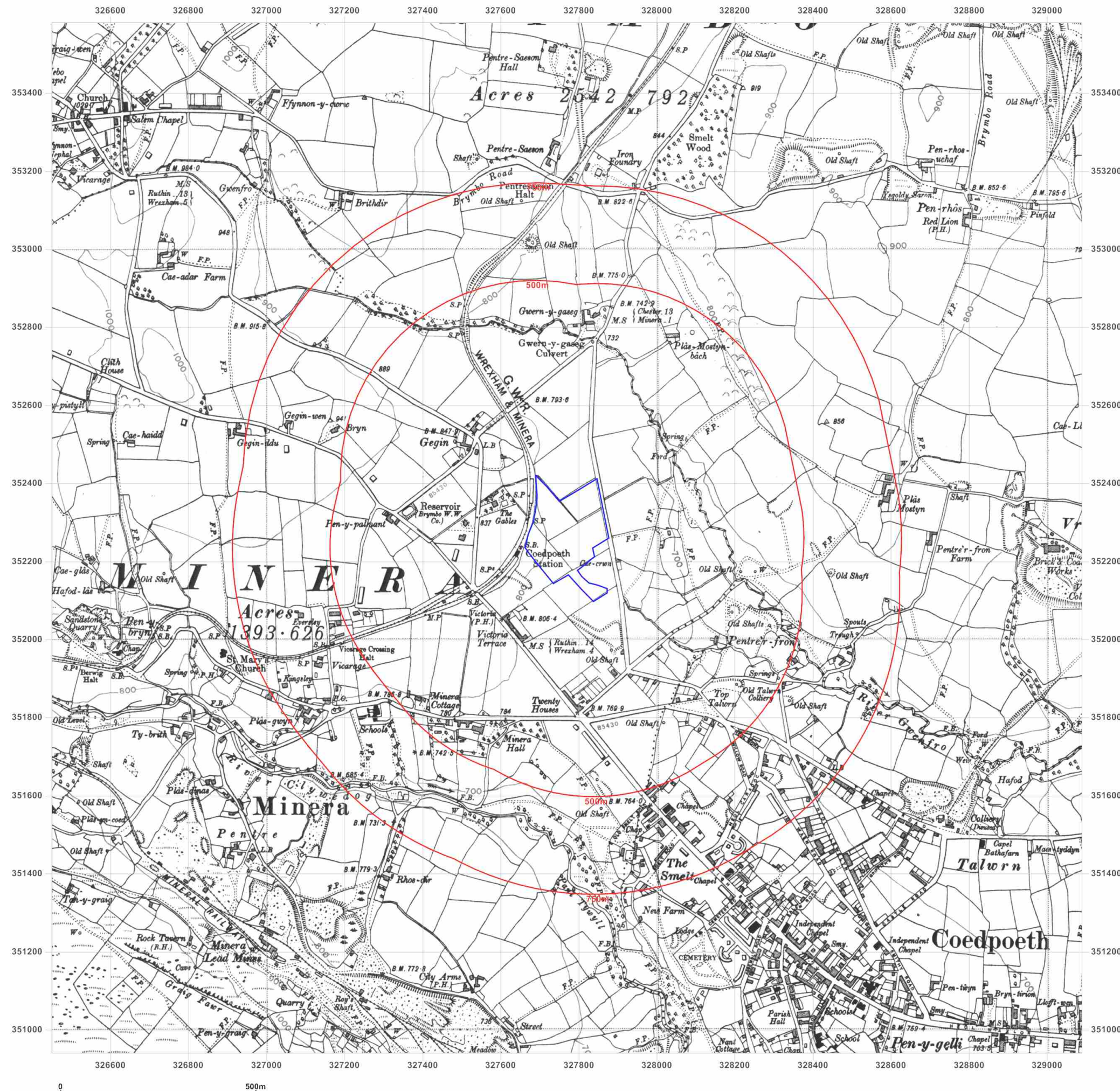


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Grid Ref: 327769, 352259

Map Name: County Series

Map date: 1949

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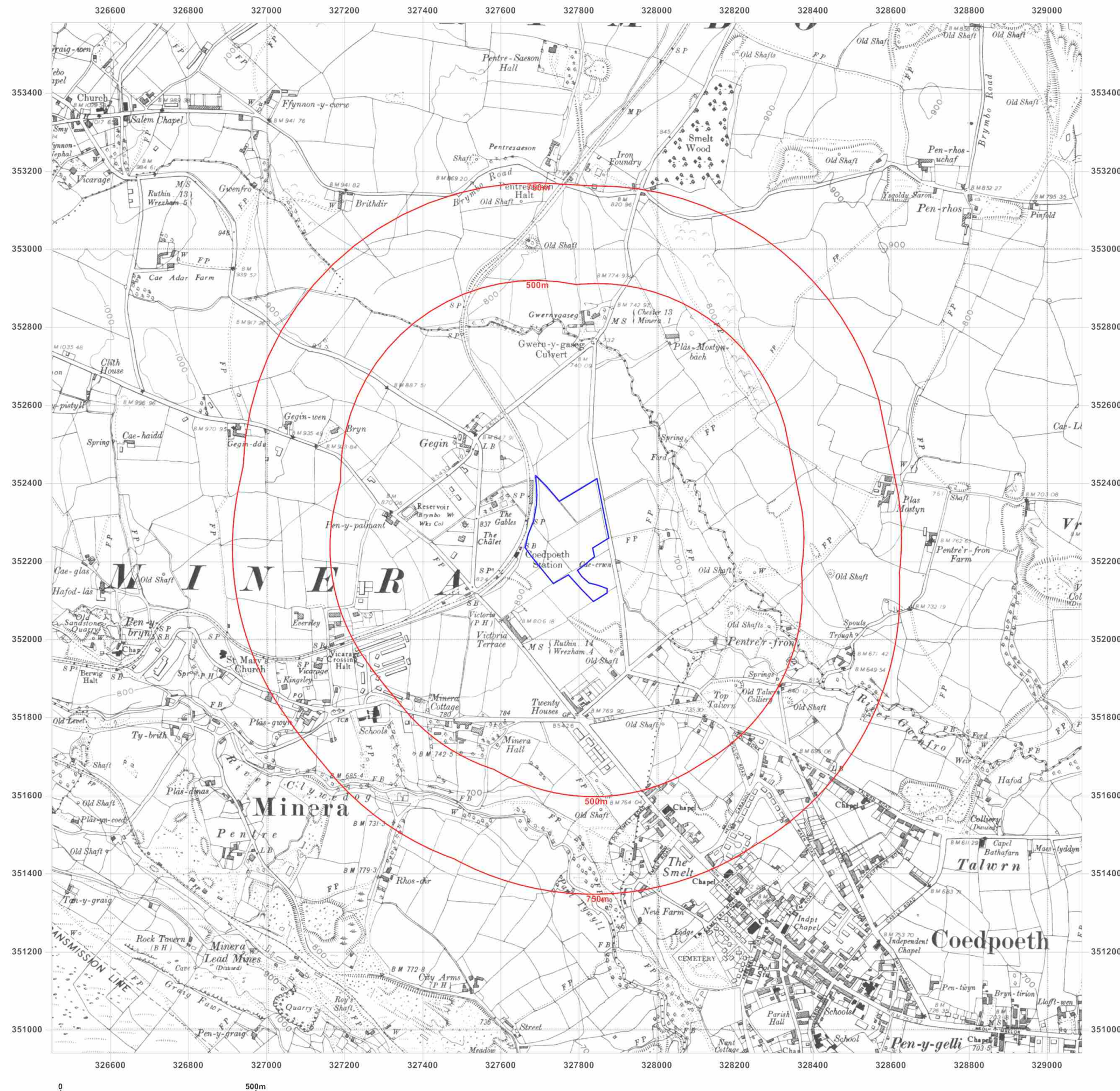


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Grid Ref: 327769, 352259

Map Name: Provisional

Map date: 1960

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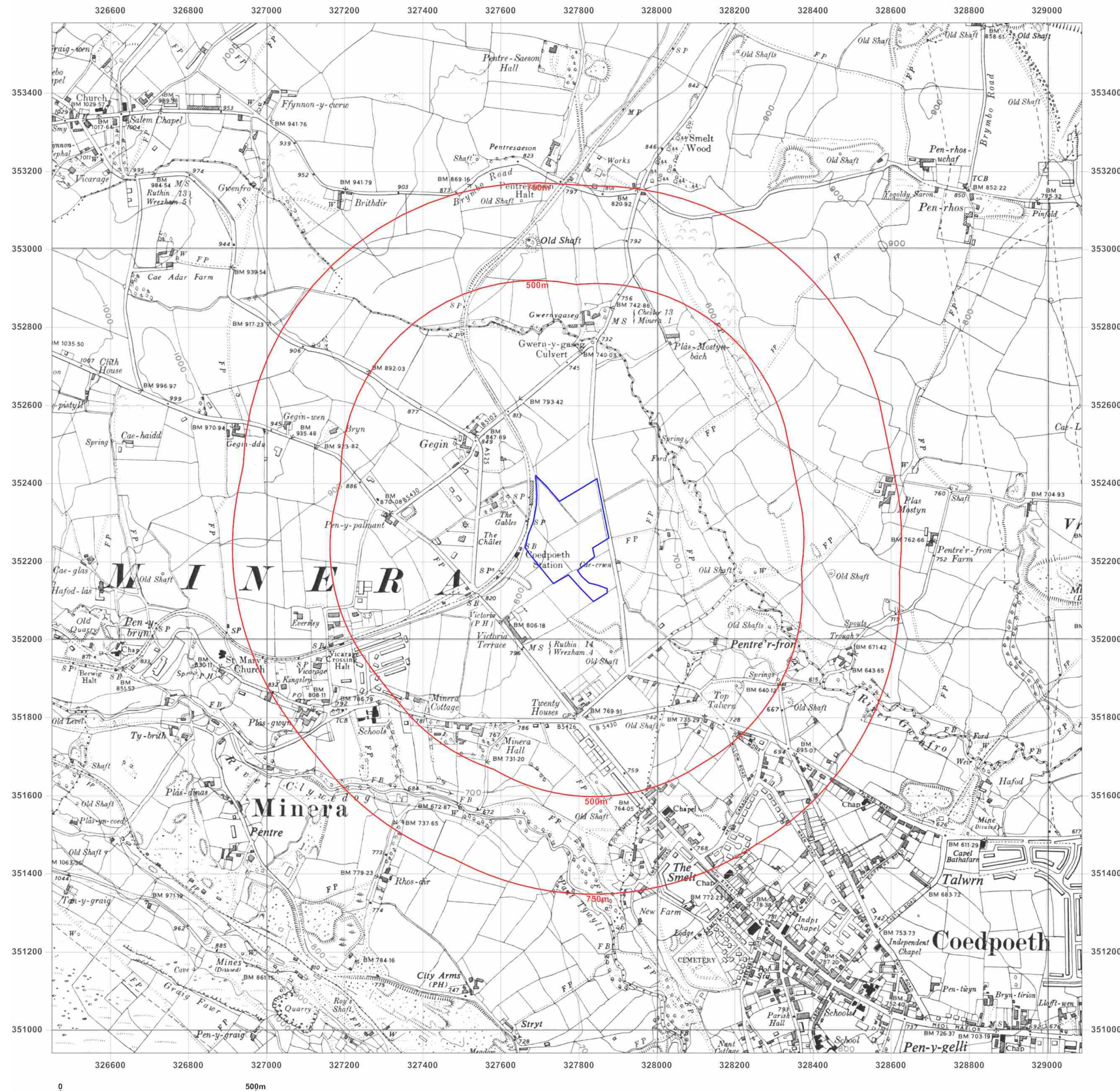


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Grid Ref: 327769, 352259

Map Name: National Grid

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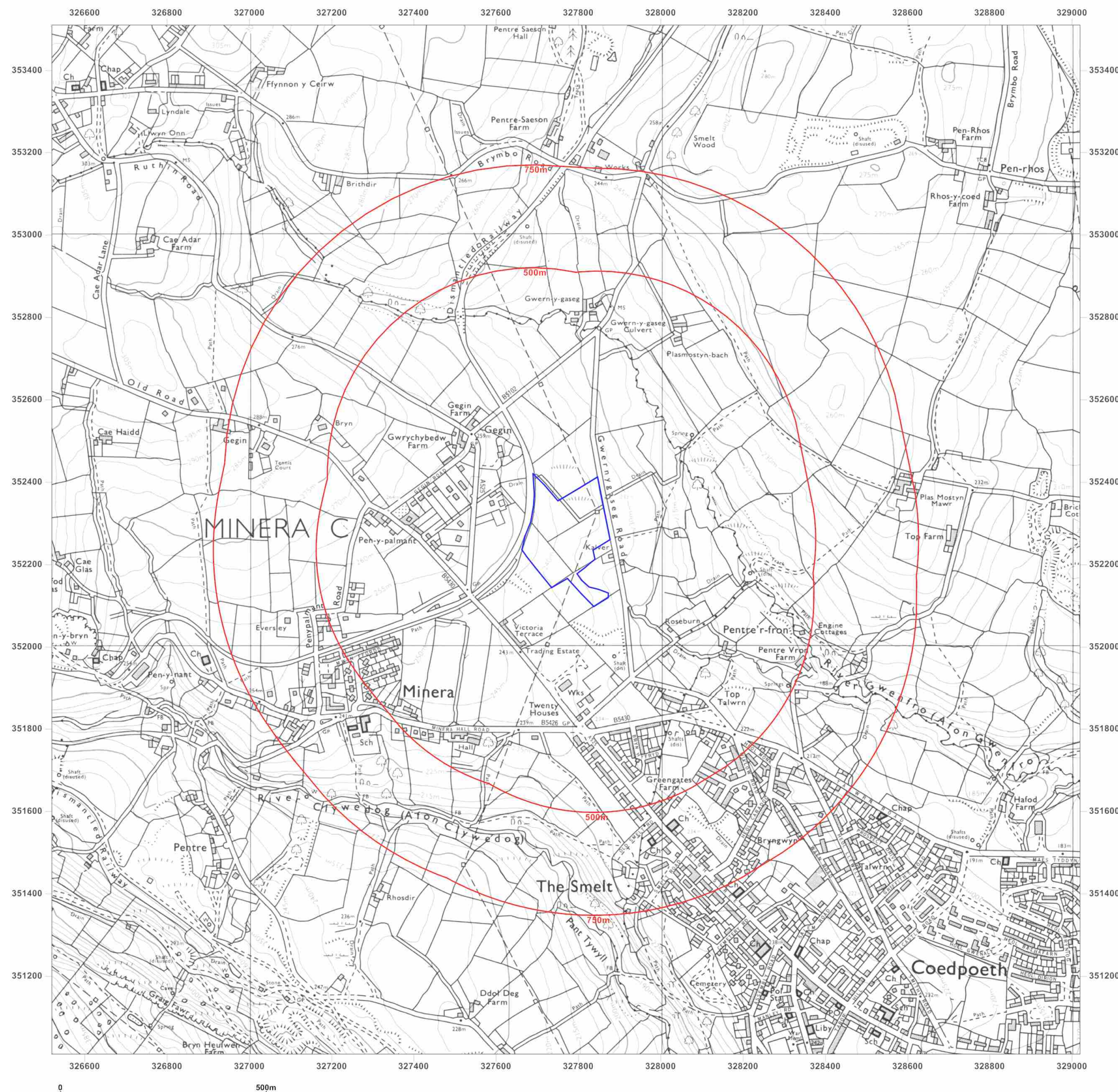


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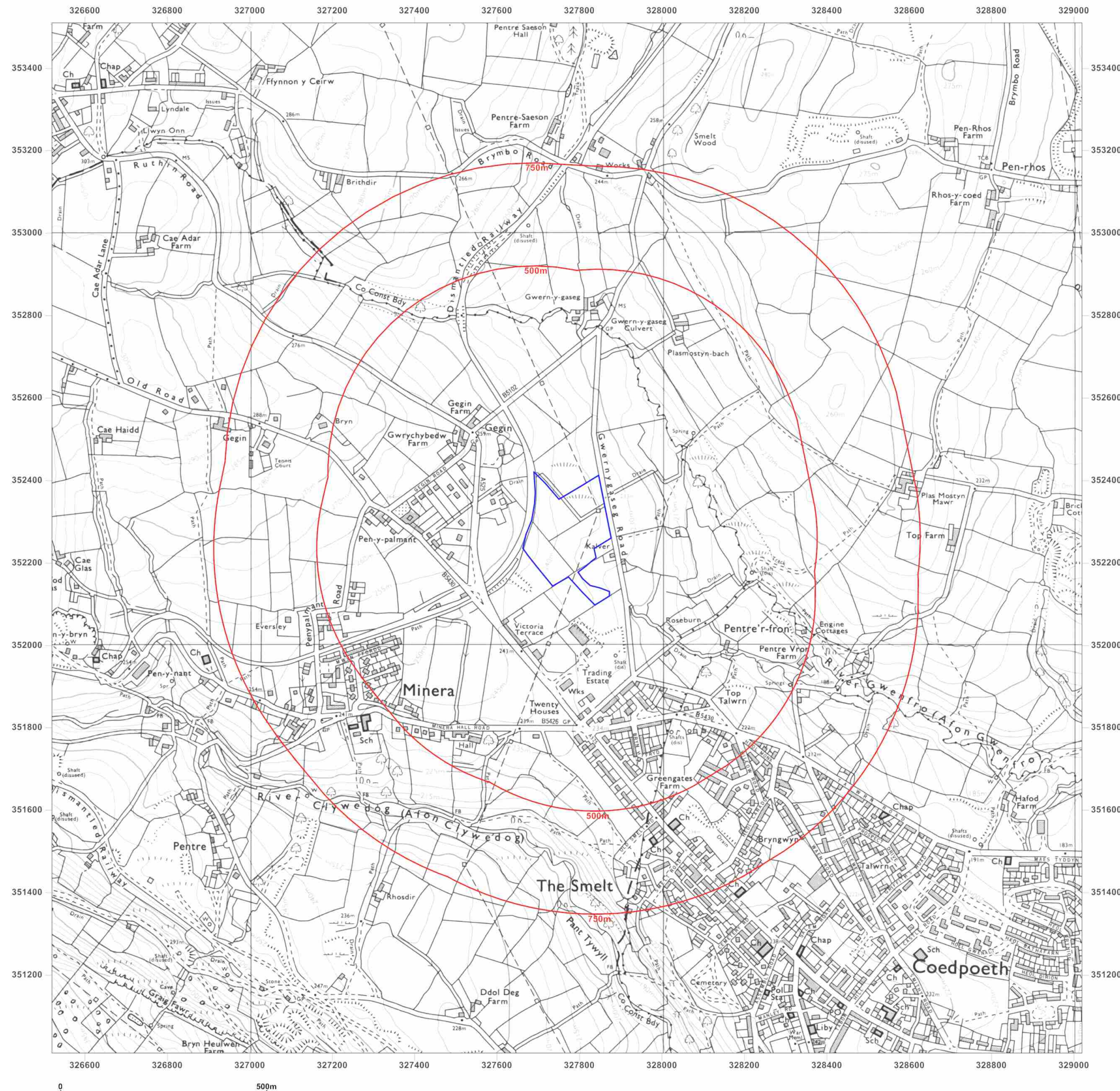


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Grid Ref: 327769, 352259

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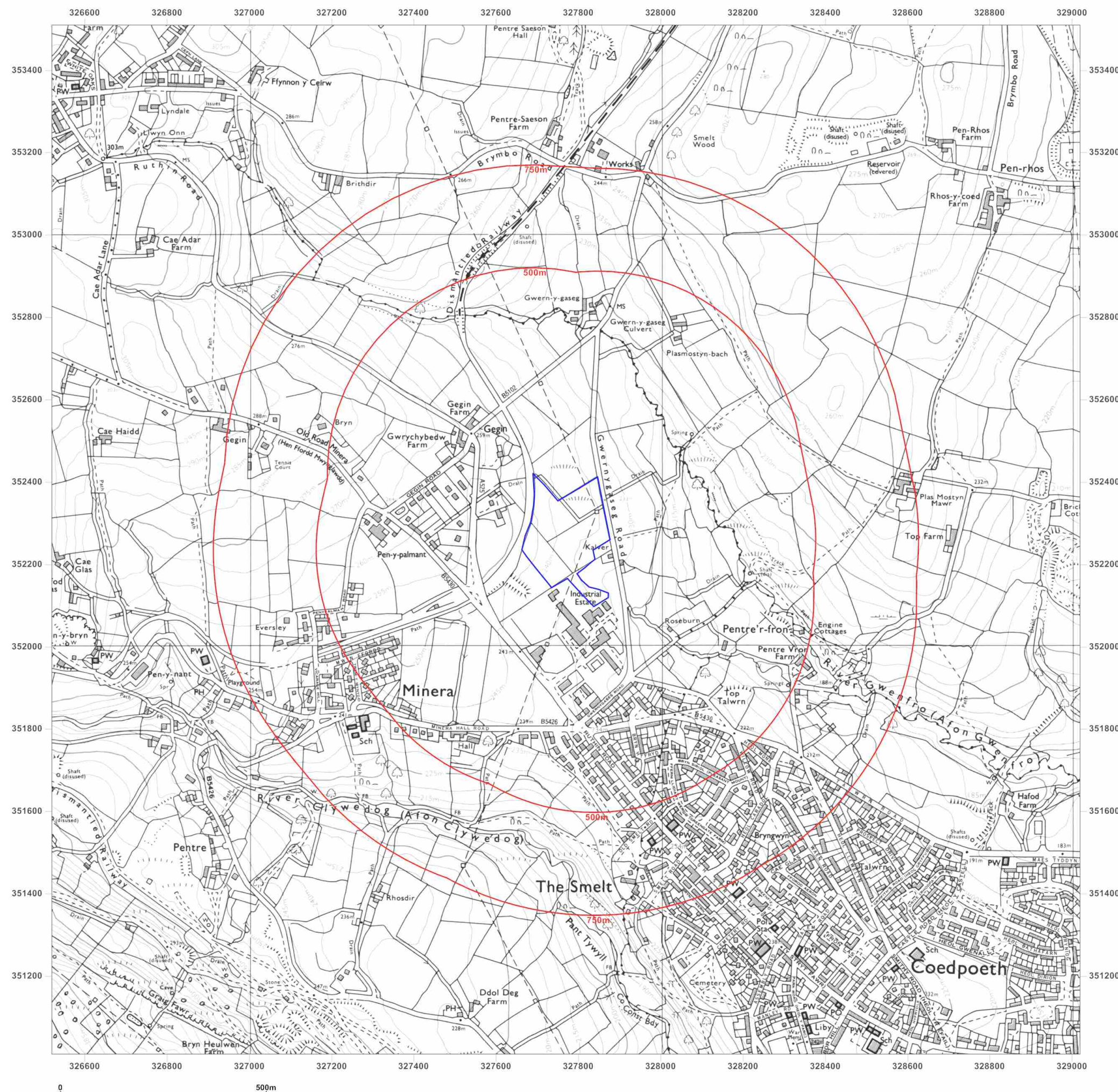


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Grid Ref: 327769, 352259

Map Name: 1:10,000 Raster

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2002



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Client Ref: Tomlinsons_Dairy
Report Ref: GS-3343998
Grid Ref: 327769, 352259

Map Name: National Grid

Map date: 2010

Scale: 1:10,000

Printed at: 1:10,000



2010

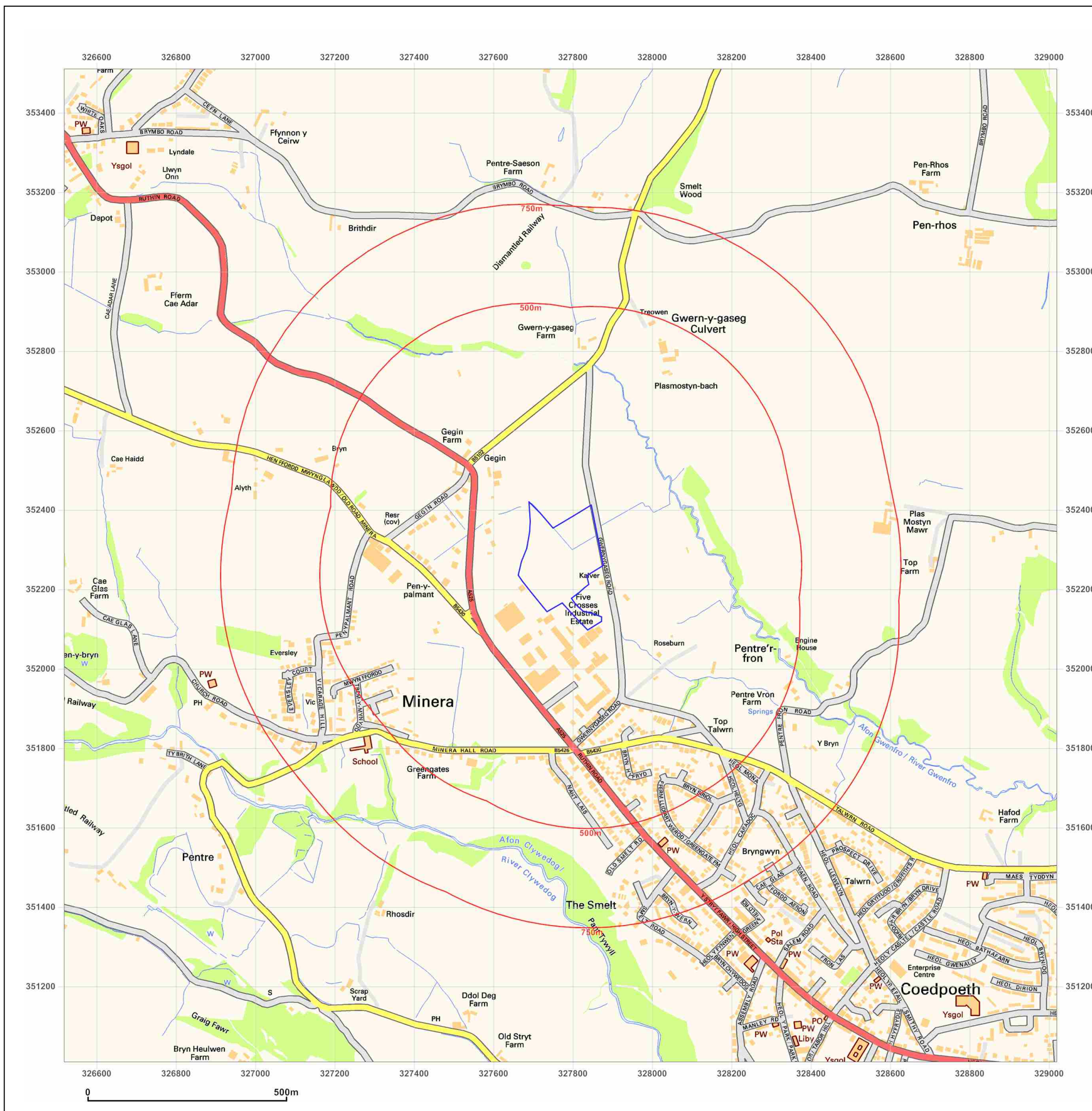


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Client Ref: Tomlinsons_Dairy
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Map Name: National Grid

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2014



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GROUND INVESTIGATION
FOR NEW DAIRY AND MILK PROCESSING FACILITY
ADJACENT TO FIVE CROSSES INDUSTRIAL ESTATE
COEDPOETH
NEAR WREXHAM

CARRIED OUT FOR:-

CLIENT: TOMLINSON'S DAIRIES LIMITED

ENGINEER: MARK DADY ASSOCIATES

DATE: FEBRUARY 2004

REPORT NO: 457

REPORT NO. 457

GROUND INVESTIGATION
FOR NEW DAIRY AND MILK PROCESSING FACILITY
ADJACENT TO FIVE CROSSES INDUSTRIAL ESTATE
COEDPOETH
NEAR WREXHAM

| <u>CONTENTS</u> | <u>PAGE NO.</u> |
|-------------------------------------|------------------------|
| 1.0 INTRODUCTION | 1 |
| 2.0 THE SITE | 2 |
| 3.0 FIELDWORK | 3 |
| 4.0 LABORATORY TESTING | 4 |
| 5.0 GROUND CONDITIONS | 6 |
| 6.0 ENGINEERING DISCUSSION | 9 |
| 7.0 CABLE PERCUSSION BOREHOLE LOGS | |
| 8.0 CONSOLIDATION TEST RESULTS | |
| 9.0 SOIL CONTAMINATION TEST RESULTS | |
| 10.0 SITE PLAN | |

REPORT NO: 457

GROUND INVESTIGATION
FOR NEW DAIRY AND MILK PROCESSING FACILITY
ADJACENT TO FIVE CROSSES INDUSTRIAL ESTATE
COEDPOETH
NEAR WREXHAM

1.0 INTRODUCTION

A ground investigation has been carried out on a plot of arable land adjacent to the Five Crosses Industrial Estate in Coedpoeth near Wrexham in North Wales. The work was commissioned by Tomlinson's Dairies Limited in December 2003. Mark Dady Associates were appointed Consulting Structural Engineers for the project which is likely to comprise the construction of one 50m x 40m and one 20m x 16m single storey steel framed buildings to house a new dairy and milk processing facility.

The purpose of the investigation was to ascertain the nature and structure of the near surface soils, in order that an assessment could be made of certain environmental and geotechnical properties with regard to the new development.

Site works consisted of sinking four cable percussion boreholes and taking samples for laboratory analysis. This report contains a factual record of the work carried out and discusses the findings in respect of the design of foundations for the new buildings. The general level of soil contamination is also discussed in respect of the presence of certain contaminants on the site.

For additional information reference should be made to a desk study prepared by the Engineer in November 2003.

2.0 THE SITE

The site is situated on the northern edge of Coedpoeth, 10km to the west of Wrexham. It is currently an undulating plot of worked arable land approximately 2.25 hectares in size. The site is bordered by Owernygaseg Road to the east while streams are found on the northern and south eastern boundary, the later exiting the site by way of a culvert. A disused railway embankment forms the north western boundary.

The site falls in height about 20 metres from west to east and a high voltage electricity pylon straddles the eastern end of the northern boundary. High voltage cables stretch across the site towards the south west.

3.0 FIELDWORK

Fieldworks were carried out between the 22nd and 27th January 2004 and the terms of reference required four boreholes of 150 mm diameter to be sunk by means of a cable percussion boring rig to a maximum depth of 10.0 metres at positions shown approximately on the appended site plan (section 10.0).

At regular intervals within the boreholes, Standard Penetration Tests (SPT's) were carried out in order to determine the strength of the Boulder Clay horizon. In between these tests nominal 104mm diameter undisturbed samples were also taken to determine their shear strength characteristics.

Sampling was carried out in accordance with the British Standards Code of Practice for Site Investigations BS 5930:1999. Representative bulk samples were recovered at each major soil change and at frequent intervals throughout

each stratum to provide a continuous record of the strata under consideration. The depths at which sampling commenced are recorded on the appended borehole logs which show, in addition, detailed information regarding the strata encountered as observed in the boreholes (section 7.0).

Due to the very soft nature of the ground surface it was decided not to supplement the borehole investigation with a number of trial pits for fear of severely damaging the crops growing in the field.

4.0 LABORATORY TESTING

4.1 Introduction

Using UKAS accredited laboratories the following programme of laboratory testing has been generally carried out on selected samples in accordance with BS 1377: Methods of Test for Soil and Civil Engineering Purposes 1990.

4.2 Atterberg Limit Tests

As an aid to their classification the liquid limit, plastic limit and plasticity index tests were carried out on three undisturbed samples of boulder clay from

borehole 2 at 1.60 metres, borehole 3 at 1.00 metre and borehole 4 at 1.00. All these results are presented on the borehole logs in section 7.0.

4.3 Triaxial Compression Tests

Quick undrained single- stage triaxial compression tests were undertaken on three undisturbed samples of Boulder Clay, as a guide to their shear strength characteristics. The moisture content and bulk and dry densities were also calculated as part of each test. Unfortunately there was not enough sample in several of the other undisturbed samples for them to be tested. All these results are included on the cable percussion borehole logs in section 7.0.

4.4 Consolidation Tests

As an indication of the settlement characteristics of the Boulder Clay, one dimensional consolidation tests were carried out on two undisturbed samples obtained from 1.00 metres in borehole 3 and 1.00 metres in borehole 4. The results of these tests are included in section 8.0.

4.3 Chemical Tests

Chemical analysis was employed to determine the pH value and soluble sulfate content (using a 2:1 water soil extract) of one sample of soil from 0.50 metres in every borehole.

The same four soil samples were tested for a general screening suite of contaminants and a general screen for any organo- phosphorous and organo-chlorine pesticides which may have been used on the site.

All the chemical test results are presented in section 9.0.

5.0 GROUND CONDITIONS

5.1 Geology

According to the available geological information, the site is expected to be underlain by glacial drift (boulder clay) overlying the Westphalian Middle Coal Measures (Productive Coal Measures) which are expected to dip towards the east.

5.2 Site History

Mark Dady Associates have produced a Desk Top Study Report for the site which contains an overview of Ordnance Survey plans dating back to 1872. This would show that the site has remained undeveloped through out its history. The adjacent Five Crosses Trading estate is not indicated on the plans until 1976.

5.3 Coal Mining

Consultation of the Desk Top Study would indicate that according to the Coal Authority Report (ref 493900 – 03), a coal seam last worked in 1884 is present between 90 and 110 metres below the site. The Authority have concluded that ground movement related to these “past coal workings should by now have ceased”.

There are no known shafts on the site and no know current workings beneath the site.

5.4 Strata Encountered

Detailed descriptions of the strata encountered by this investigation are given on the borehole logs.

The boreholes proved an average topsoil thickness of 0.4 metres. This was underlain by Boulder Clay consisting of stiff fissured mottled brown and grey very silty sandy gravelly clay which becomes dark brown or grey in colour with depth. Cobbles and boulders were proved within the horizon.

Bedrock expected to consist of the Westphalian Middle Coal Measures was not proved by the borehole investigation with all of the boreholes terminating in the glacial drift.

5.5 Groundwater

The speed with which the boring was carried out combined with the low permeability of the glacial drift deposits have precluded from the true groundwater conditions being encountered in all four boreholes. All four boreholes were dry for the short period they were open with the exception of borehole 2 where a seepage was noted at a depth of 1.00 metre. Large influxes

of groundwater are not anticipated during excavations for the foundations. Any water which does enter should be readily removed by pumping from open sumps.

6.0 ENGINEERING DISCUSSION

6.1 Introduction

The site plan presented in section 10.0 indicates the possible location of the two steel framed buildings. These will be constructed in the western half of the site and will have a combined area of 2320 m².

At the time of writing this report, it was not known what the level of the new buildings will be in relation to the existing topography. Depending on the final ground profile some regrading operations may be required to form developable plateaus.

6.2 Foundations

The borehole investigation has proved that below the surface of the site up to 0.4 metres of topsoil is underlain by a firm to stiff becoming stiff fissured brown very silty sandy gravelly clay to at least 10.0 metres.

Prior to construction the topsoil should be stripped from each building area.

As a general guide, safe allowable bearing pressures (kN/m^2) for both strip and pad foundations at depths of 1.00 and 2.00 metres below existing ground level are given below assuming a breadth to the pad foundation of 2 metres and a 1 metre breadth for strip foundations:-

| <u>Foundation Type</u> | <u>Depth (metres) below existing ground level</u> | |
|------------------------|---|--------------------|
| | <u>1.00 metre</u> | <u>2.00 metres</u> |
| Strip | 140 | 250 |
| Pad | 150 | 270 |

The above are based on shear strength values derived from the Standard Penetration Tests and Triaxial Compression Tests.

Great care should be taken to inspect the soils exposed at the formation level of the foundations, to ensure that conditions are similar to those described on the borehole logs and assumed for the above allowable bearing pressures.

Weathering could rapidly soften the cohesive deposits and reduce their bearing capacity; hence care should be taken to avoid such occurrences by, for example, immediately blinding the formation upon exposure within a layer of concrete where possible.

Consolidation tests carried out at a depth of 1.00 metre in borehole 3 and 4 indicate that the near surface weathered boulder clays have a medium compressibility (section 8.0). Allowing for the fact that the clays are over consolidated, total settlements are unlikely to exceed an order of 25 mm, provided the required bearing capacities for a particular depth and foundation type are kept within those loadings mentioned in the table.

The atterberg limit tests have indicated that the clays are of a low to intermediate plasticity and low shrinkage potential. Consequently the minimum depth of foundation should be 0.75 metres. For buildings sited in their proposed position, founding levels would not need to be increased due to the proximity of the trees which are at least 20 – 25 metres away.

It is expected that due to the highly cohesive nature of the sub surface soils, disposal of surface waters by means of soakaways would be impractical.

6.3 Buried Concrete

In accordance with BRE Special Digest 1 (SD1) chemical analysis has been carried out on four soil samples in order to determine the Aggressive Chemical Environment for Concrete (ACEC) class of the site. Based on the results and the guidelines contained in part 1 of SD1 it should be possible to assign an ACEC class for the site of AC – 1 for all buried concrete.

6.4 Soil Contamination

Four samples of soil have been tested for a general range of contaminants as listed in section 9.0.

Where appropriate the new Contaminated Land Exposure Assessment Model (CLEA) has been used to compare the concentrations of arsenic, cadmium, chromium, mercury, nickel, selenium and lead with their appropriate Soil

Guideline Values (SGV). In using the SGV the proposed land use has been considered as commercial/ industrial.

The concentrations for arsenic, cadmium, chromium, mercury, nickel, selenium and lead were all well below their respective Soil Guideline Values as listed in SGV 1, 3, 4, 5, 7, 9 and 10, and as such based on these contaminants the site could be considered suitable for development without the need for any remedial action to be taken.

The levels found for the other contaminants did not give cause for concern for the proposed end use. No organo-chlorine and organo-phosphorous pesticides were detected in the clay soils directly below the topsoil.

T.J. McLaren, BSc.,FGS
Engineering Geologist

H.S. Lister, BSc., C. Geol.,FGS.,
Director

7.0 CABLE PERCUSSION BOREHOLE LOGS

GROUND INVESTIGATION SPECIALISTS LIMITED

| | | | | |
|----------------------------|-------------------|----------|--|--|
| BOREHOLE RECORD | BORING COMMENCED: | 22.01.04 | TYPE OF BORING: Cable Percussion CLIENT: Tomlinson's Dairies Limited ENGINEER: Mark Dady Associates CONTRACT: Coedpoeth, Nr Wrexham | BOREHOLE: 1 SHEET: 1 OF 1 JOB NO: 457 |
| | BORING COMPLETED: | 22.01.04 | | |
| | GROUND LEVEL: | | | |
| | | | | |

DRILLING

[illegible]

| GROUNDWATER OBSERVATIONS: | | W - Water Sample | M/C - Natural Moisture Content | 'N' - Standard or Cone Penetration Test Result | S - Standard Penetration Test |
|---------------------------|------------------------------|------------------------|--------------------------------|--|---|
| Dry | ▼ - Final groundwater level | | | | |
| | ▽ - Groundwater first struck | B - Bulk Sample | LL - Liquid Limit | | C - Cone Penetration Test |
| | ▲ - Standpipe | J - Jar Sample | PL - Plastic Limit | T - Undrained Triaxial | V - Vane Test (pocket) |
| | ● - Piezometer | U - Undisturbed Sample | PI - Plasticity Index | M - Multi-stage Undrained Triaxial | SO ₃ - Soluble Sulphate Analysis |

GROUND INVESTIGATION SPECIALISTS LIMITED

BOREHOLE RECORD

BORING COMMENCED: 23.01.04
BORING COMPLETED: 23.01.04
GROUND LEVEL:

TYPE OF BORING: Cable Percussion
DIAMETER OF HOLE: 150 mm
BOREHOLE CASING: 1.50 metres

CLIENT: Tomlinson's Dairies Limited
ENGINEER: Mark Dady Associates
CONTRACT: Coedpoeth, Nr Wrexham

BOREHOLE: 2
SHEET: 1 OF 1
JOB NO: 457

DRILLING

| DESCRIPTION OF STRATA | LEGEND | WATER LEVEL | THICKNESS | DEPTH | REDUCED LEVEL | DEPTH | INDEX PROPERTIES | | | | | DENSITIES | | STRENGTH TESTS | | IN-SITU CHEMICAL AND OTHER TESTS AND REMARKS (SPT Blows) |
|--|--------|-------------|-----------|-------|---------------|-------|------------------|-------|------|------|----|--------------------------|--------------------------|----------------|-------------------------------|--|
| | | | | | | | 'N' VALUE | IMC % | LL % | PL % | PI | WET (kg/m ³) | DRY (kg/m ³) | TYPE | COHESION (kN/m ²) | |
| Dark brown TOPSOIL (drillers description) | | | 0.40 | GL | | 0.40 | | | | | | | | | | |
| Firm to stiff mottled brown and light grey very silty sandy CLAY with some fine to coarse angular to sub-angular gravel of various lithologies and occasional limestone cobbles. (BOULDER CLAY) Becomes stiff, dark brown in colour and includes fine to medium gravel from 1.90 metres. Includes much light brown sandstone fragments from 2.10 – 2.80 metres. Becomes firm to stiff below 3.30 metres | ▽ | | | 1.00 | | | 28 | 14 | 32 | 18 | 14 | 2200 | 1940 | T | 93 | No recovery (2.5.8.8.6.6.) Poor recovery (8.6.3.3.3.3.) (2.2.2.2.3.4.) |
| | | | | | | | | | | | | | | | | |
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| | | | | | | | | | | | | | | | | |
| Becomes stiff from 9.50 metres. Borehole complete | | | 9.60 | 10.00 | | | 15 | | | | | | | | | Insufficient recovery for triaxial test Poor recovery due to cobble (8.3.3.3.4.6.) (8.3.5.6.8.8.) |
| | | | | | | | | | | | | | | | | |
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GROUNDWATER OBSERVATIONS:
Seepage at 1.00 metres. Water cut off by casing at 1.50 metres.

W - Water Sample
B - Bulk Sample
J - Jar Sample
U - Undisturbed Sample

M/C - Natural Moisture Content
LL - Liquid Limit
PL - Plastic Limit
PI - Plasticity Index

'N' - Standard or Cone Penetration Test Result
T - Undrained Triaxial
M - Multi-stage Undrained Triaxial

S - Standard Penetration Test
C - Cone Penetration Test
V - Vane Test (pocket)
SO₃ - Soluble Sulphate Analysis

GROUND INVESTIGATION SPECIALISTS LIMITED

| | | | | |
|------------------------|----------------------------|----------------------------------|-------------------------------------|--|
| BOREHOLE RECORD | BORING COMMENCED: 26.01.04 | TYPE OF BORING: Cable Percussion | CLIENT: Tomlinson's Dairies Limited | BOREHOLE: 3 SHEET: 1 OF 1 JOB NO: 457 |
| | BORING COMPLETED: 26.01.04 | DIAMETER OF HOLE: 150 mm | ENGINEER: Mark Dady Associates | |
| | GROUND LEVEL: | BOREHOLE CASING: 1.50 metres | CONTRACT: Coedpoeth, Nr Wrexham | |
| | | | | |

| DRILLING | LEGEND | DESCRIPTION OF STRATA | SAMPLES | | | | | | | | | | RESULTS OF TESTS | | | | IN-SITU CHEMICAL AND OTHER TESTS AND REMARKS (SPT Blows) |
|----------|--------|--|-------------|-----------|-------|---------------|-------|------|----------|-------|------|------|------------------|-----------|----------------|--------------------------------------|--|
| | | | WATER LEVEL | THICKNESS | DEPTH | REDUCED LEVEL | DEPTH | TYPE | N' VALUE | M/C % | LL % | PL % | PI | DENSITIES | STRENGTH TESTS | ANGLE OF INTERNAL FRICTION (degrees) | |
| | | Dark brown TOPSOIL (drillers description) | | 0.30 | GL | | | | | | | | | | | | |
| | | Firm to stiff becoming stiff fissured mottled brown and light grey silty sandy CLAY with some fine to coarse sub-angular gravel of various lithologies. (BOULDER CLAY) | | | 0.30 | | | B1 | | 24 | 41 | 24 | 17 | | | | Insufficient recovery due to nature of material |
| | | Becomes dark brown in colour from 2.00 metres. | | | | | | U2 | | | | | | | | | (1.5.6.6.6.7.) |
| | | Becomes grey in colour from 3.00 metres. | | | | | | B3 | | | | | | | | | (3.4.5.6.6.5.) |
| | | Becomes very clayey SILT from 3.80 – 4.00 metres and 4.80 – 5.45 metres. | | 8.23 | | | | B4 | | | | | | | | | (4.6.6.5.6.7.) |
| | | Becomes very silty from 6.00 – 6.80 metres. | | | | | | S5 | | | | | | | | | Insufficient recovery due to nature of material |
| | | | | | | | | B6 | | | | | | | | | |
| | | | | | | | | S7 | | | | | | | | | |
| | | | | | | | | B8 | | | | | | | | | |
| | | | | | | | | S9 | | | | | | | | | |
| | | | | | | | | B10 | | | | | | | | | |
| | | | | | | | | U11 | | | | | | | | | |
| | | | | | | | | B12 | | | | | | | | | |
| | | | | | | | | B13 | | | | | | | | | |
| | | | | | | | | S14 | | | | | | | | | |
| | | | | | | | | B15 | | | | | | | | | |
| | | | | | | | | U16 | | | | | | | | | |
| | | | | | | | | B17 | | | | | | | | | |
| | | | | | | | | S18 | | | | | | | | | |
| | | | | | | | | B19 | | | | | | | | | |
| | | | | | | | | S19 | | | | | | | | | |
| | | Borehole complete | | | | | | | | | | | | | | | Chiselled for ½ Hour from 8.30- 8.53 metres. (3.4.42.8) |

| | | | | | |
|---------------------------|--------------------------|------------------------|--------------------------------|--|---|
| GROUNDWATER OBSERVATIONS: | Final groundwater level | W - Water Sample | M/C - Natural Moisture Content | 'N' - Standard or Cone Penetration Test Result | S - Standard Penetration Test |
| | Groundwater first struck | B - Bulk Sample | LL - Liquid Limit | T - Undrained Triaxial | C - Cone Penetration Test |
| | Standpipe | J - Jar Sample | PL - Plastic Limit | M - Multi-stage Undrained Triaxial | V - Vane Test (pocket) |
| | Piezometer | U - Undisturbed Sample | PI - Plasticity Index | | SO ₃ - Soluble Sulphate Analysis |

GROUND INVESTIGATION SPECIALISTS LIMITED

| | | | | |
|------------------------|----------------------------|----------------------------------|-------------------------------------|---------------|
| BOREHOLE RECORD | BORING COMMENCED: 22.01.04 | TYPE OF BORING: Cable Percussion | CLIENT: Tomlinson's Dairies Limited | BOREHOLE: 4 |
| | BORING COMPLETED: 22.01.04 | DIAMETER OF HOLE: 150 mm | ENGINEER: Mark Dady Associates | SHEET: 1 OF 1 |
| | GROUND LEVEL: | BOREHOLE CASING: 1.50 metres | CONTRACT: Coedpoeth, Nr Wrexham | JOB NO: 457 |
| | | | | |

DRILLING

| DESCRIPTION OF STRATA | LEGEND | WATER LEVEL | THICKNESS | DEPTH | REDUCED LEVEL | DEPTH | INDEX PROPERTIES | | | | | DENSITIES | | STRENGTH TESTS | IN-SITU CHEMICAL AND OTHER TESTS AND REMARKS (SPT Blows) |
|--|--------|-------------|-----------|-------|---------------|-------|------------------|-------|------|------|----|--------------------------|--------------------------|----------------|---|
| | | | | | | | 'N' VALUE | M/C % | LL % | PL % | PI | WET (kg/m ³) | DRY (kg/m ³) | | |
| Dark brown TOPSOIL (drillers description) | | | 0.40 | GL | | | | | | | | | | | |
| Firm to stiff becoming stiff fissured mottled brown and light grey silty sandy CLAY with some fine to medium sub-angular gravel of various lithologies. (BOULDER CLAY) Becomes very clayey SILT and moist from 1.80 – 2.00 metres. Becomes grey grey in colour from 2.00 metres. Becomes very silty from 3.00 – 4.00 metres. Includes boulder from 3.50- 3.80 metres. | | | | 0.40 | | | | 14 | 34 | 19 | 15 | | | | Insufficient recovery due to nature of material (5.6.6.6.9.6.) |
| | | | | | | | | | | | | | | | (8.10.5.6.6.6.) |
| | | | | | | | | | | | | | | | Chiselled for 1/2 hour from 3.50 – 3.80 metres. |
| | | | | | | | | | | | | | | | (2.3.4.5.6.) |
| | | | | | | | | | | | | | | | No recovery (3.7.6.6.5.6.) |
| | | | | | | | | | | | | | | | (5.6.3.4.6.6.) |
| | | | | | | | | | | | | | | | No recovery (2.4.6.6.8.30.) |
| | | | | | | | | | | | | | | | Chiselled for 1 hour from 7.50- 7.52 metres. |
| | | | | | | | | | | | | | | | 25 blows for 10 mm, then 50 blows for 10 mm |
| | | | | | | | | | | | | | | | |
| Becomes very silty from 5.80 – 6.80 metres and from 7.10 metres. | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| Borehole terminated on possible boulder. | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |

| GROUNDWATER OBSERVATIONS: | W - Water Sample | M/C - Natural Moisture Content | 'N' - Standard or Cone Penetration Test Result | S - Standard Penetration Test |
|---------------------------|------------------------|--------------------------------|--|---|
| | | | | |
| Dry | B - Bulk Sample | LL - Liquid Limit | T - Undrained Triaxial | C - Cone Penetration Test |
| | J - Jar Sample | PL - Plastic Limit | M - Multi-stage Undrained Triaxial | V - Vane Test (pocket) |
| | U - Undisturbed Sample | PI - Plasticity Index | | SO ₃ - Soluble Sulphate Analysis |

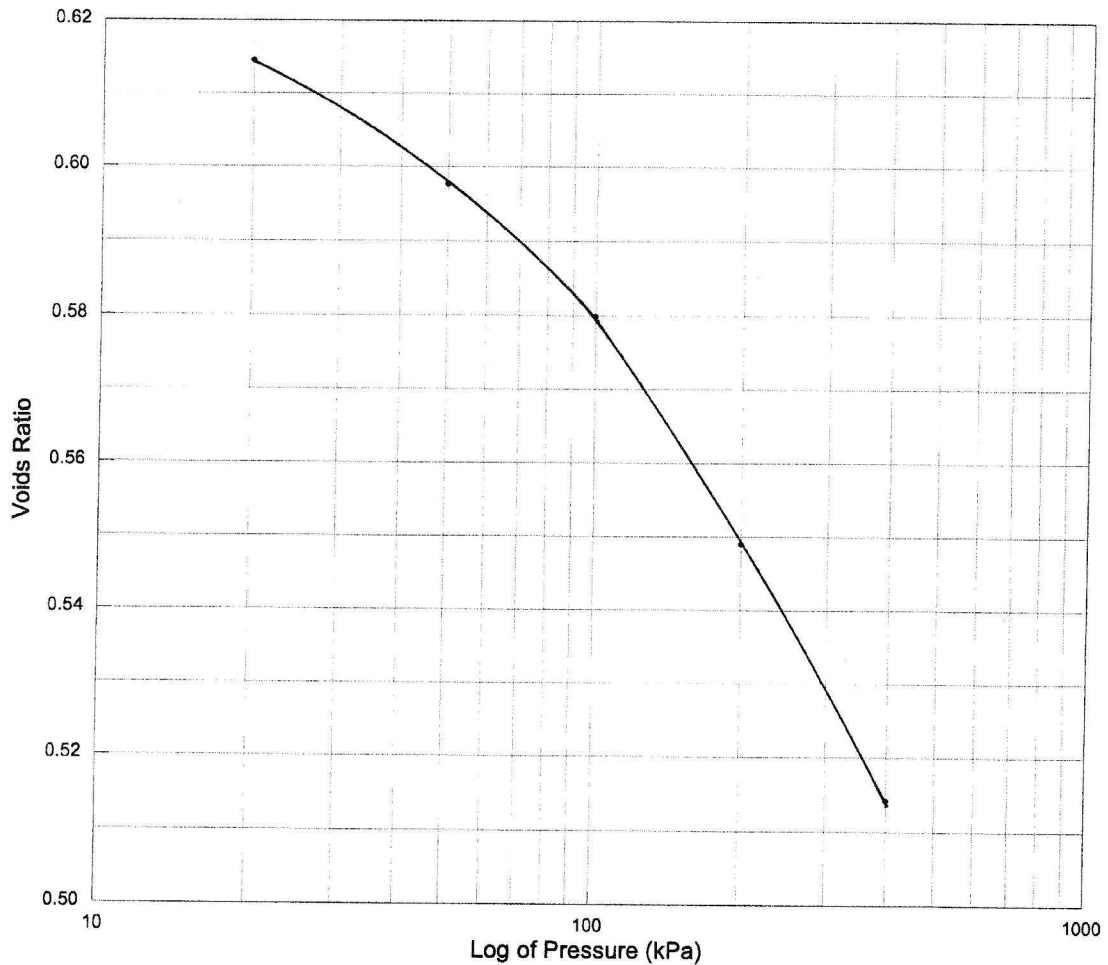
8.0 CONSOLIDATION TEST RESULTS

Determination of One Dimensional Consolidation Properties of Soil

Borehole No: 3
 Sample No: U2
 Depth: 1.00m
 Depth within original sample: 1.30m
 Orientation: Vertical
 Specimen preparation: Undisturbed

Description:

Soft to firm brown slightly sandy CLAY with occasional fine to coarse gravel.



Initial Conditions:

Moisture Content (%) 25
 Voids Ratio 0.627
 Diameter (mm) 76.2
 Height (mm) 18.6
 Bulk Density (Mg/m³) 2.05
 Dry Density (Mg/m³) 1.64

Final Conditions:

Moisture Content (%) 22
 Voids Ratio 0.514
 Particle Density (Mg/m³) 2.67 (Assumed)
 Laboratory Temperature (°C) 19.1

| Pressure Range (kPa) | Mv (m ² /MN) | Cv (m ² /yr) | Time Fitting Method | Voids Ratio |
|----------------------|-------------------------|-------------------------|---------------------|-------------|
| 0 - 20 | 0.377 | 2.15 | t50 | 0.614 |
| 20 - 50 | 0.347 | 2.20 | t50 | 0.598 |
| 50 - 100 | 0.223 | 3.90 | t50 | 0.580 |
| 100 - 200 | 0.195 | 2.83 | t50 | 0.549 |
| 200 - 400 | 0.112 | 4.69 | t50 | 0.514 |

Checked and Approved

Initials: *JS*

Date: 1/3/04

Project Number:

GEO / 6744

Project Name:

COEDPOETH - WREXHAM

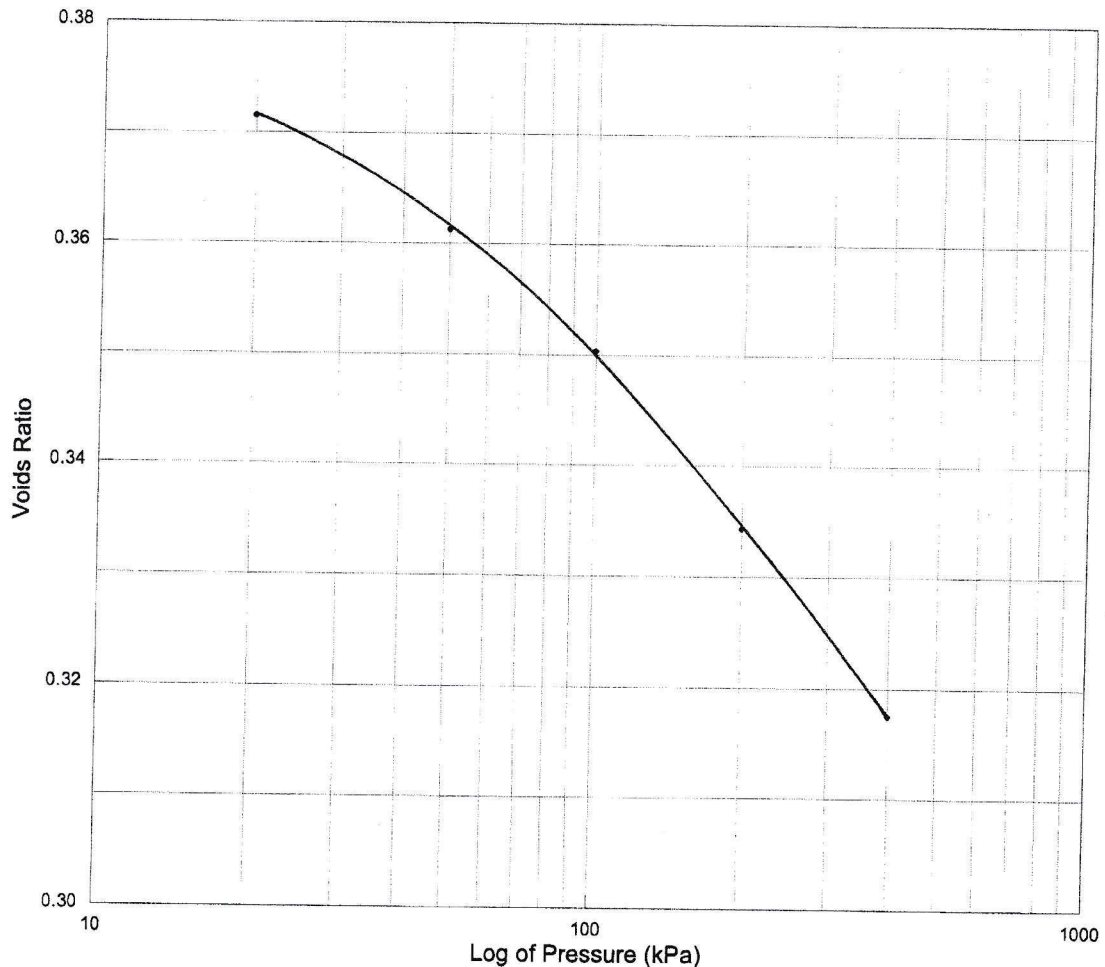
GEOLABS

Determination of One Dimensional Consolidation Properties of Soil

Borehole No: 4
 Sample No: U2
 Depth: 1.00m
 Depth within original sample: 1.25m
 Orientation: Vertical
 Specimen preparation: Undisturbed

Description:

Firm mottled grey and brown silty CLAY with occasional fine to coarse gravel.



Initial Conditions:

Moisture Content (%) 15
 Voids Ratio 0.382
 Diameter (mm) 76.2
 Height (mm) 18.7
 Bulk Density (Mg/m³) 2.24
 Dry Density (Mg/m³) 1.94

Final Conditions:

Moisture Content (%) 15
 Voids Ratio 0.317
 Particle Density (Mg/m³) 2.68 (Assumed)
 Laboratory Temperature (°C) 19.1

| Pressure Range (kPa) | Mv (m ² /MN) | Cv (m ² /yr) | Time Fitting Method | Voids Ratio |
|----------------------|-------------------------|-------------------------|---------------------|-------------|
| 0 - 20 | 0.372 | 6.08 | t50 | 0.372 |
| 20 - 50 | 0.250 | 3.45 | t50 | 0.361 |
| 50 - 100 | 0.160 | 4.50 | t50 | 0.350 |
| 100 - 200 | 0.119 | 3.58 | t50 | 0.334 |
| 200 - 400 | 0.063 | 6.43 | t50 | 0.317 |

Checked and Approved

Initials: *SC*

Date: 1/3/04

Project Number:

GEO / 6744

Project Name:

COEDPOETH - WREXHAM

GEOLABS

9.0 SOIL CONTAMINATION TEST RESULTS

ISO 17025 accredited
* Subcontracted test
» Shown on prev. report

Matrix: SOLID
Location: COEDPOETH
Client Contact: T McLaren

All results expressed on a dry weight basis.

Page 9 of 11

ALcontrol Geochem Analytical Services

Table Of Results - Appendix

Job Number:

04/02169/02

Client:

Ground Investigation Specialists Limited

Client Ref. No.:

Report Key :

NDP No Determination Possible

* Subcontracted test

NFD No Fibres Detected

» Result previously reported (Incremental reports only)

ISO 17025 accredited

Note: Method detection limits are not always achievable due to various circumstances beyond our control.

Summary of Method Codes contained within report :

| Method No. | Reference | Description | Accredited ISO 17025 | Accredited MCERTS | Wet/Dry Sample ¹ |
|------------|---|---|----------------------|-------------------|-----------------------------|
| TM062 | MEWAM BOOK 124 1988.HMSO/ Method 17.7, Second Site property, March 2003 | Determination of Monohydric Phenols by HPLC with electro-chemical detection | Y | N | WET |
| TM098 | Method 4500E, AWWA/APHA, 20th Ed., 1999 | Determination of Sulphate using the Kone Analyser | Y | N | DRY |
| TM105 | Method 4500D, AWWA/APHA, 20th Ed., 1999 | Determination of Acid Soluble Sulphide in soil samples using the Kone Analyser | Y | N | WET |
| TM129 | Method 3120B, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 3050B | Determination of Metal Cations by IRIS Emission Spectrometer | Y | N | DRY |
| TM133 | BS 1377: Part 3 1990 | Determination of pH in Soil and Water using the GLpH pH Meter | Y | N | WET |
| TM136 | Method 17.10, Second Site property, March 2003 | Determination of Sulphur by HPLC | Y | N | DRY |
| TM148 | BS 1377: Part 3 1990 (Extraction) | Analysis of Total Sulphate using Unicam 701 Spectrophotometer | N | N | DRY |
| TM153 | Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999 | Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the "Skalar SANS+ System" Segmented Flow Analyser | Y | N | WET |
| TM154 | In - house Method | Determination of Petroleum Hydrocarbons by EZ Flash GC-FID in the Carbon range C6- C40 | Y | N | WET |
| | | | | | |
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| | | | | | |

¹ Applies to Solid samples only. DRY indicates samples have been dried at 35°C. NA = not applicable.

Alcontrol Geochem

Organo-Chlorine and Organo-Phosphorous Pesticides

Sample Identity - 200402169-001/BH1 0.5
Client / Sample matrix - /soil
Units - µg/kg

| CAS Number | Compound | Concentration |
|------------|---------------------|---------------|
| 62-73-7 | Dichorvos | <1 |
| 7786-34-7 | Mevinphos | <1 |
| 319-84-6 | Alpha-BHC | <1 |
| 319-85-7 | Beta-BHC | <1 |
| 58-89-9 | Gamma-BHC | <1 |
| 333-41-5 | Diazinon | <1 |
| 298-00-0 | Methyl Parathion | <1 |
| 76-44-8 | heptachlor | <1 |
| 122-14-5 | Fenitrothion | <1 |
| 121-75-5 | Malathion | <1 |
| 309-00-2 | Aldrin | <1 |
| 56-38-2 | Parathion | <1 |
| 1024-57-3 | Heptachlor Epoxide | <1 |
| 959-98-8 | Endosulfan I | <1 |
| 72-55-9 | 4,4-DDE | <1 |
| 60-57-1 | Dieldrin | <1 |
| 72-20-8 | Endrin | <1 |
| 33213-65-9 | Endosulfan II | <1 |
| 72-54-8 | 4,4-DDD | <1 |
| 563-12-2 | Ethion | <1 |
| 50-29-3 | 4,4-DDT | <1 |
| 1031-07-8 | Endosulfan Sulphate | <1 |
| 72-43-5 | Methoxychlor | <1 |
| 86-50-0 | Azinphos Methyl | <1 |
| Total | | <1 |

Alcontrol Geochem

Organo-Chlorine and Organo-Phosphorous Pesticides

Sample Identity - 200402169-002/BH2 0.5
 Client / Sample matrix - /soil
 Units - µg/kg

| CAS Number | Compound | Concentration |
|--------------|---------------------|---------------|
| 62-73-7 | Dichorvos | <1 |
| 7786-34-7 | Mevinphos | <1 |
| 319-84-6 | Alpha-BHC | <1 |
| 319-85-7 | Beta-BHC | <1 |
| 58-89-9 | Gamma-BHC | <1 |
| 333-41-5 | Diazinon | <1 |
| 298-00-0 | Methyl Parathion | <1 |
| 76-44-8 | heptachlor | <1 |
| 122-14-5 | Fenitrothion | <1 |
| 121-75-5 | Malathion | <1 |
| 309-00-2 | Aldrin | <1 |
| 56-38-2 | Parathion | <1 |
| 1024-57-3 | Heptachlor Epoxide | <1 |
| 959-98-8 | Endosulfan I | <1 |
| 72-55-9 | 4,4-DDE | <1 |
| 60-57-1 | Dieldrin | <1 |
| 72-20-8 | Endrin | <1 |
| 33213-65-9 | Endosulfan II | <1 |
| 72-54-8 | 4,4-DDD | <1 |
| 563-12-2 | Ethion | <1 |
| 50-29-3 | 4,4-DDT | <1 |
| 1031-07-8 | Endosulfan Sulphate | <1 |
| 72-43-5 | Methoxychlor | <1 |
| 86-50-0 | Azinphos Methyl | <1 |
| Total | | <1 |

Alcontrol Geochem

Organo-Chlorine and Organo-Phosphorous Pesticides

Sample Identity - 200402169-003/BH3 0.5
Client / Sample matrix - /soil
Units - µg/kg

| CAS Number | Compound | Concentration |
|------------|---------------------|---------------|
| 62-73-7 | Dichorvos | <1 |
| 7786-34-7 | Mevinphos | <1 |
| 319-84-6 | Alpha-BHC | <1 |
| 319-85-7 | Beta-BHC | <1 |
| 58-89-9 | Gamma-BHC | <1 |
| 333-41-5 | Diazinon | <1 |
| 298-00-0 | Methyl Parathion | <1 |
| 76-44-8 | heptachlor | <1 |
| 122-14-5 | Fenitrothion | <1 |
| 121-75-5 | Malathion | <1 |
| 309-00-2 | Aldrin | <1 |
| 56-38-2 | Parathion | <1 |
| 1024-57-3 | Heptachlor Epoxide | <1 |
| 959-98-8 | Endosulfan I | <1 |
| 72-55-9 | 4,4-DDE | <1 |
| 60-57-1 | Dieldrin | <1 |
| 72-20-8 | Endrin | <1 |
| 33213-65-9 | Endosulfan II | <1 |
| 72-54-8 | 4,4-DDD | <1 |
| 563-12-2 | Ethion | <1 |
| 50-29-3 | 4,4-DDT | <1 |
| 1031-07-8 | Endosulfan Sulphate | <1 |
| 72-43-5 | Methoxychlor | <1 |
| 86-50-0 | Azinphos Methyl | <1 |
| Total | | <1 |

Alcontrol Geochem

Organo-Chlorine and Organo-Phosphorous Pesticides

Sample Identity - 200402169-004/BH4 0.5
Client / Sample matrix - /soil
Units - µg/kg

| CAS Number | Compound | Concentration |
|------------|---------------------|---------------|
| 62-73-7 | Dichorvos | <1 |
| 7786-34-7 | Mevinphos | <1 |
| 319-84-6 | Alpha-BHC | <1 |
| 319-85-7 | Beta-BHC | <1 |
| 58-89-9 | Gamma-BHC | <1 |
| 333-41-5 | Diazinon | <1 |
| 298-00-0 | Methyl Parathion | <1 |
| 76-44-8 | heptachlor | <1 |
| 122-14-5 | Fenitrothion | <1 |
| 121-75-5 | Malathion | <1 |
| 309-00-2 | Aldrin | <1 |
| 56-38-2 | Parathion | <1 |
| 1024-57-3 | Heptachlor Epoxide | <1 |
| 959-98-8 | Endosulfan I | <1 |
| 72-55-9 | 4,4-DDE | <1 |
| 60-57-1 | Dieldrin | <1 |
| 72-20-8 | Endrin | <1 |
| 33213-65-9 | Endosulfan II | <1 |
| 72-54-8 | 4,4-DDD | <1 |
| 563-12-2 | Ethion | <1 |
| 50-29-3 | 4,4-DDT | <1 |
| 1031-07-8 | Endosulfan Sulphate | <1 |
| 72-43-5 | Methoxychlor | <1 |
| 86-50-0 | Azinphos Methyl | <1 |
| Total | | <1 |

10.0 SITE PLAN

DOCKET

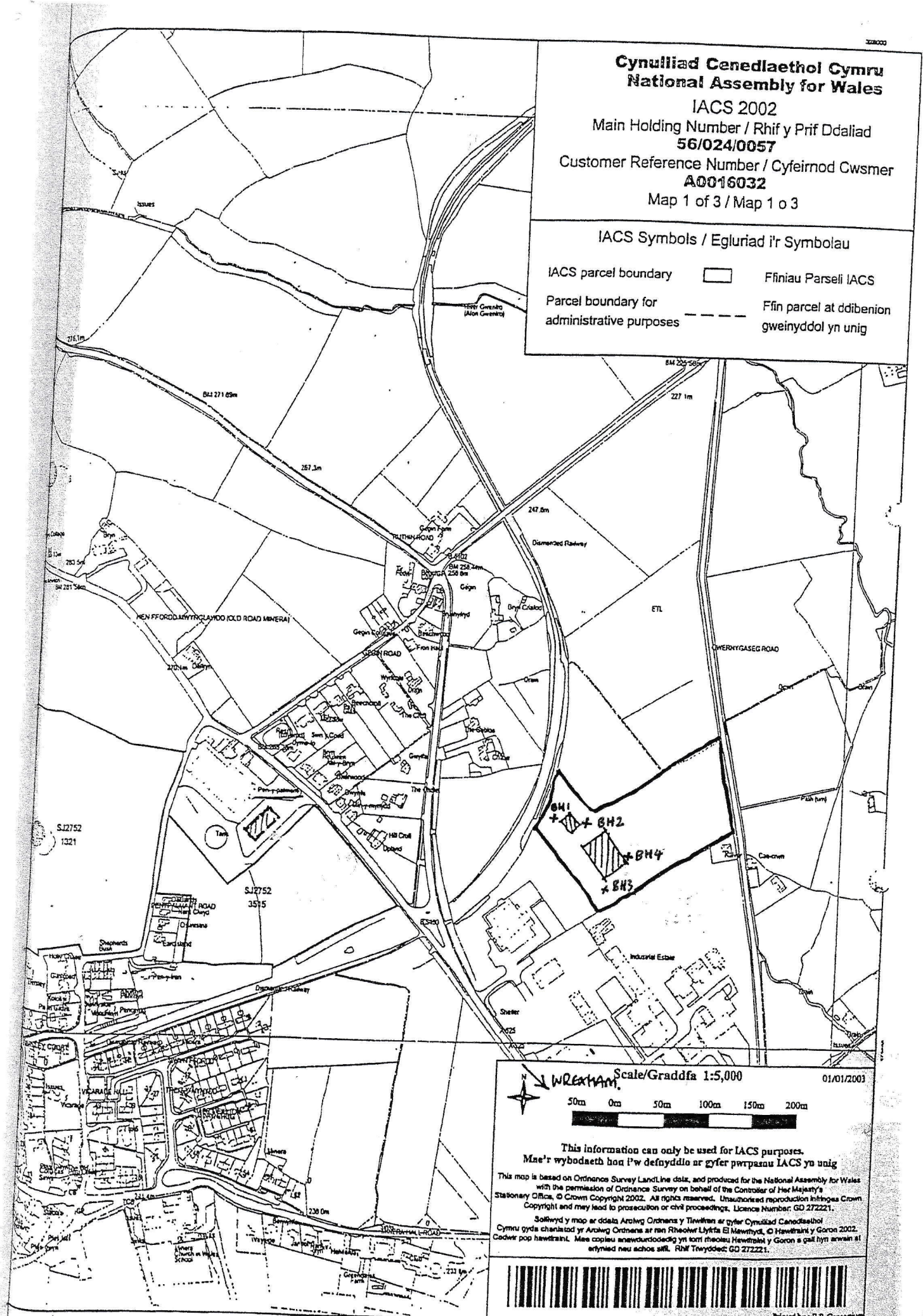
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27 OCT 1962

ANNEX D Groundsure Report



Paul Downing Ltd
23, Carlton Road,
Headley Down, GU35 8JW

Groundsure Reference: GS-3343997
Your Reference: Tomlinsons_Dairy
Report Date 3 Oct 2016
Report Delivery Method: Email - pdf

Groundsure Enviro Insight

Address: UNIT D, FIVE CROSSES INDUSTRIAL ESTATE, WREXHAM, LL11 3RD

Dear Sir/ Madam,

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

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

Yours faithfully,

Managing Director
Groundsure Limited

Enc.
Groundsure Enviroinsight

Groundsure Enviro Insight

Address: UNIT D, FIVE CROSSES INDUSTRIAL ESTATE, WREXHAM, LL11 3RD
Date: 3 Oct 2016
Reference: GS-3343997
Client: Paul Downing Ltd

NW

N

NE

W

E



SW

S

SE

Aerial Photograph Capture date: 09-Jun-2013
Grid Reference: 327762,352256
Site Size: 3.98ha

Report Reference: GS-3343997
Client Reference: Tomlinsons_Dairy

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Overview of Findings

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

| Section 1: Historical Industrial Sites | On-site | 0-50 | 51-250 | 251-500 |
|--|---------|-------|--------|---------|
| 1.1 Potentially Contaminative Uses identified from 1:10,000 scale mapping | 3 | 19 | 31 | 90 |
| 1.2 Additional Information – Historical Tank Database | 0 | 0 | 1 | 1 |
| 1.3 Additional Information – Historical Energy Features Database | 0 | 0 | 3 | 3 |
| 1.4 Additional Information – Historical Petrol and Fuel Site Database | 0 | 0 | 0 | 0 |
| 1.5 Additional Information – Historical Garage and Motor Vehicle Repair Database | 0 | 0 | 0 | 4 |
| 1.6 Potentially Infilled Land | 0 | 9 | 16 | 95 |
| Section 2: Environmental Permits, Incidents and Registers | On-site | 0-50m | 51-250 | 251-500 |
| 2.1 Industrial Sites Holding Environmental Permits and/or Authorisations | | | | |
| 2.1.1 Records of historic IPC Authorisations | 0 | 0 | 0 | 0 |
| 2.1.2 Records of Part A(1) and IPPC Authorised Activities | 0 | 0 | 0 | 0 |
| 2.1.3 Records of Red List Discharge Consents | 0 | 0 | 0 | 0 |
| 2.1.4 Records of List 1 Dangerous Substances Inventory sites | 0 | 0 | 0 | 0 |
| 2.1.5 Records of List 2 Dangerous Substances Inventory sites | 0 | 0 | 0 | 0 |
| 2.1.6 Records of Part A(2) and Part B Activities and Enforcements | 0 | 0 | 3 | 0 |
| 2.1.7 Records of Category 3 or 4 Radioactive Substances Authorisations | 0 | 0 | 0 | 0 |
| 2.1.8 Records of Licensed Discharge Consents | 0 | 0 | 0 | 2 |
| 2.1.9 Records of Water Industry Referrals | 0 | 0 | 0 | 0 |
| 2.1.10 Records of Planning Hazardous Substance Consents and Enforcements within 500m of the study site | 0 | 0 | 0 | 0 |
| 2.2 Records of COMAH and NIHHS sites | 0 | 0 | 0 | 0 |
| 2.3 Environment Agency Recorded Pollution Incidents | | | | |
| 2.3.1 National Incidents Recording System, List 2 | 0 | 0 | 0 | 2 |
| 2.3.2 National Incidents Recording System, List 1 | 0 | 0 | 0 | 0 |
| 2.4 Sites Determined as Contaminated Land under Part 2A EPA 1990 | 0 | 0 | 0 | 0 |

| Section 3: Landfill and Other Waste Sites | On-site | 0-50m | 51-250 | 251-500 | 501-1000 | 1000-1500 |
|--|---------|-------|--------|---------|--------------|--------------|
| 3.1 Landfill Sites | | | | | | |
| 3.1.1 Environment Agency Registered Landfill Sites | 0 | 0 | 0 | 0 | 0 | Not searched |
| 3.1.2 Environment Agency Historic Landfill Sites | 0 | 0 | 0 | 0 | 1 | 3 |
| 3.1.3 BGS/DoE Landfill Site Survey | 0 | 0 | 0 | 0 | 0 | 0 |
| 3.1.4 Records of Landfills in Local Authority and Historical Mapping Records | 0 | 0 | 0 | 0 | 0 | 1 |
| 3.2 Landfill and Other Waste Sites Findings | | | | | | |
| 3.2.1 Operational and Non-Operational Waste Treatment, Transfer and Disposal Sites | 0 | 0 | 0 | 0 | Not searched | Not searched |
| 3.2.2 Environment Agency Licensed Waste Sites | 0 | 0 | 2 | 0 | 0 | 3 |

| Section 4: Current Land Use | On-site | 0-50m | 51-250 | 251-500 |
|--|---------|-------|--------|--------------|
| 4.1 Current Industrial Sites Data | 2 | 5 | 23 | Not searched |
| 4.2 Records of Petrol and Fuel Sites | 0 | 0 | 0 | 0 |
| 4.3 National Grid Underground Electricity Cables | 0 | 0 | 0 | 0 |
| 4.4 National Grid Gas Transmission Pipelines | 0 | 0 | 0 | 0 |

| Section 5: Geology | |
|--|-----|
| 5.1 Are there any records of Artificial Ground and Made Ground present beneath the study site? | Yes |
| 5.2 Are there any records of Superficial Ground and Drift Geology present beneath the study site? | Yes |
| 5.3 For records of Bedrock and Solid Geology beneath the study site see the detailed findings section. | |

| Section 6: Hydrogeology and Hydrology | 0-500m | | | | | |
|--|---------|-------|--------|---------|--------------|--------------|
| 6.1 Are there any records of Strata Classification in the Superficial Geology within 500m of the study site? | Yes | | | | | |
| 6.2 Are there any records of Strata Classification in the Bedrock Geology within 500m of the study site? | Yes | | | | | |
| | On-site | 0-50m | 51-250 | 251-500 | 501-1000 | 1000-2000 |
| 6.3 Groundwater Abstraction Licences (within 2000m of the study site) | 0 | 0 | 0 | 0 | 1 | 1 |
| 6.4 Surface Water Abstraction Licences (within 2000m of the study site) | 0 | 0 | 0 | 0 | 0 | 0 |
| 6.5 Potable Water Abstraction Licences (within 2000m of the study site) | 0 | 0 | 0 | 0 | 1 | 1 |
| 6.6 Source Protection Zones (within 500m of the study site) | 0 | 0 | 0 | 0 | Not searched | Not searched |
| 6.7 Source Protection Zones within Confined Aquifer | 0 | 0 | 0 | 0 | Not searched | Not searched |
| 6.8 Groundwater Vulnerability and Soil Leaching Potential (within 500m of the study site) | 1 | 0 | 2 | 0 | Not searched | Not searched |
| | On-site | 0-50m | 51-250 | 251-500 | 501-1000 | 1000-1500 |

Section 6: Hydrogeology and Hydrology

0-500m

| | | | | | | |
|--|-----|-----|-----|--------------|--------------|--------------|
| 6.9 Is there any Environment Agency information on river quality within 1500m of the study site? | No | No | No | No | No | No |
| 6.10 Detailed River Network entries within 500m of the site | 1 | 1 | 8 | 8 | Not searched | Not searched |
| 6.11 Surface water features within 250m of the study site | Yes | Yes | Yes | Not searched | Not searched | Not searched |

Section 7: Flooding

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

Section 8: Designated Environmentally Sensitive Sites

On-site 0-50m 51-250 251-500 501-1000 1000-2000

| | | | | | | |
|--|---|---|---|---|---|----|
| 8.1 Records of Sites of Special Scientific Interest (SSSI) | 0 | 0 | 0 | 0 | 0 | 2 |
| 8.2 Records of National Nature Reserves (NNR) | 0 | 0 | 0 | 0 | 0 | 0 |
| 8.3 Records of Special Areas of Conservation (SAC) | 0 | 0 | 0 | 0 | 0 | 3 |
| 8.4 Records of Special Protection Areas (SPA) | 0 | 0 | 0 | 0 | 0 | 0 |
| 8.5 Records of Ramsar sites | 0 | 0 | 0 | 0 | 0 | 0 |
| 8.6 Records of Ancient Woodlands | 0 | 0 | 0 | 1 | 8 | 39 |
| 8.7 Records of Local Nature Reserves (LNR) | 0 | 0 | 0 | 0 | 0 | 0 |
| 8.8 Records of World Heritage Sites | 0 | 0 | 0 | 0 | 0 | 0 |
| 8.9 Records of Environmentally Sensitive Areas | 0 | 0 | 0 | 0 | 0 | 0 |
| 8.10 Records of Areas of Outstanding Natural Beauty (AONB) | 0 | 0 | 0 | 0 | 1 | 0 |

| Section 8: Designated Environmentally Sensitive Sites | On-site | 0-50m | 51-250 | 251-500 | 501-1000 | 1000-2000 |
|---|---------|-------|--------|---------|----------|-----------|
| 8.11 Records of National Parks | 0 | 0 | 0 | 0 | 0 | 0 |
| 8.12 Records of Nitrate Sensitive Areas | 0 | 0 | 0 | 0 | 0 | 0 |
| 8.13 Records of Nitrate Vulnerable Zones | 0 | 0 | 0 | 0 | 0 | 0 |
| 8.14 Records of Green Belt land | 0 | 0 | 0 | 0 | 0 | 0 |

| Section 9: Natural Hazards | |
|--|--|
| 9.1 What is the maximum risk of natural ground subsidence? | Very Low |
| 9.1.1 What is the maximum Shrink-Swell hazard rating identified on the study site? | Very Low |
| 9.1.2 What is the maximum Landslides hazard rating identified on the study site? | Very Low |
| 9.1.3 What is the maximum Soluble Rocks hazard rating identified on the study site? | Negligible |
| 9.1.4 What is the maximum Compressible Ground hazard rating identified on the study site? | Very Low |
| 9.1.5 What is the maximum Collapsible Rocks hazard rating identified on the study site? | Very Low |
| 9.1.6 What is the maximum Running Sand hazard rating identified on the study site? | Very Low |
| 9.2 Radon | |
| 9.2.1 Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level? | The property is in a Radon Affected Area, as between 5 and 10% of properties are above the Action Level. |
| 9.2.2 Is the property in an area where Radon Protection are required for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment? | Basic radon protective measures are necessary. |

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

Using this report

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

1. Historical Industrial Sites

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

2. Environmental Permits, Incidents and Registers

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

3. Landfills and Other Waste Sites

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

4. Current Land Uses

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

5. Geology

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

6. Hydrogeology and Hydrology

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

7. Flooding

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

8. Designated Environmentally Sensitive Sites

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

9. Natural Hazards

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

10. Mining

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

11. Contacts

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

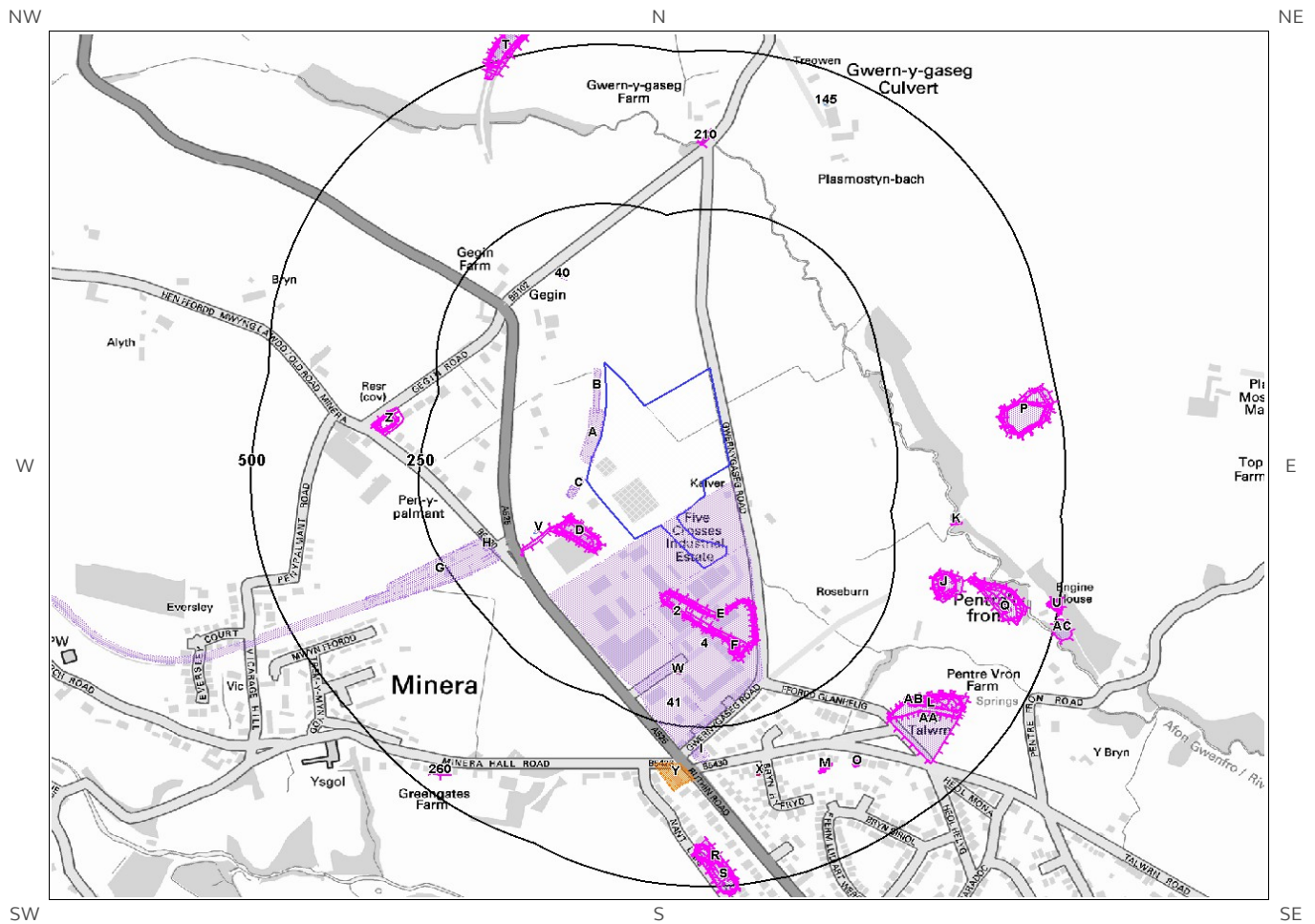
Note: Maps

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

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

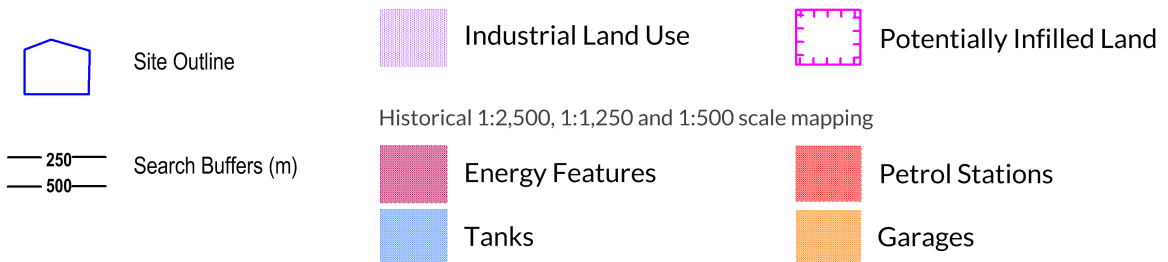
All distances given in this report are in Metres (m). Directions are given as compass headings such as N: North, E: East, NE: North East from the nearest point of the study site boundary.

1. Historical Land Use



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



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

1. Historical Industrial Sites

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

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

Records of sites with a potentially contaminative past land use within 500m of the search boundary: 143

| ID | Distance [m] | Direction | Use | Date |
|-----|--------------|-----------|-----------------------------------|------|
| 1A | 0 | On Site | Railway Sidings | 1960 |
| 2 | 0 | On Site | Unspecified Commercial/Industrial | 1989 |
| 3A | 0 | W | Railway Sidings | 1938 |
| 4 | 1 | SE | Unspecified Works | 1985 |
| 5C | 3 | W | Railway Station | 1900 |
| 6B | 7 | W | Railway Building | 1938 |
| 7B | 7 | W | Railway Building | 1960 |
| 8B | 8 | W | Railway Building | 1949 |
| 9A | 8 | W | Railway Sidings | 1910 |
| 10C | 18 | SW | Railway Station | 1938 |
| 11C | 19 | SW | Railway Station | 1910 |
| 12C | 19 | SW | Railway Station | 1960 |
| 13C | 20 | SW | Railway Station | 1949 |
| 14D | 41 | SW | Unspecified Heap | 1938 |
| 15D | 41 | SW | Unspecified Heap | 1938 |
| 16D | 42 | SW | Unspecified Heap | 1900 |
| 17D | 42 | SW | Unspecified Ground Workings | 1910 |
| 18D | 43 | SW | Unspecified Heap | 1949 |
| 19D | 44 | SW | Unspecified Heap | 1985 |
| 20D | 44 | SW | Unspecified Heap | 1974 |
| 21D | 44 | SW | Unspecified Heap | 1989 |
| 22D | 44 | SW | Unspecified Heap | 1960 |
| 23E | 52 | SW | Unspecified Heap | 1985 |
| 24E | 52 | SW | Unspecified Heap | 1974 |
| 25E | 55 | S | Unspecified Heap | 1900 |
| 26E | 56 | SW | Unspecified Heap | 1938 |
| 27E | 56 | SW | Unspecified Heap | 1938 |
| 28E | 59 | SW | Unspecified Ground Workings | 1910 |
| 29E | 61 | SW | Unspecified Heap | 1949 |
| 30E | 62 | SW | Unspecified Heap | 1960 |
| 31V | 99 | SW | Railway Building | 1949 |
| 32F | 130 | S | Unspecified Old Shaft | 1938 |

| | | | | |
|-----|-----|----|---------------------------|------|
| 33F | 130 | S | Unspecified Old Shaft | 1938 |
| 34F | 131 | S | Unspecified Old Shaft | 1910 |
| 35F | 132 | SE | Unspecified Old Shaft | 1900 |
| 36F | 132 | S | Unspecified Old Shaft | 1949 |
| 37F | 134 | S | Unspecified Disused Shaft | 1985 |
| 38F | 134 | S | Unspecified Disused Shaft | 1974 |
| 39F | 134 | S | Unspecified Old Shaft | 1960 |
| 40 | 142 | NW | Railway Building | 1872 |
| 41 | 161 | S | Unspecified Works | 1974 |
| 42G | 173 | SW | Mineral Railway Sidings | 1938 |
| 43 | 174 | SW | Railway Sidings | 1900 |
| 44H | 176 | SW | Railway Building | 1938 |
| 45G | 178 | SW | Railway Sidings | 1960 |
| 46G | 179 | SW | Railway Sidings | 1949 |
| 47H | 179 | SW | Railway Building | 1938 |
| 48H | 180 | SW | Railway Building | 1949 |
| 49H | 181 | SW | Railway Building | 1960 |
| 50G | 196 | SW | Railway Sidings | 1910 |
| 51G | 245 | SW | Railway Building | 1938 |
| 52G | 248 | SW | Railway Building | 1960 |
| 53G | 249 | SW | Railway Building | 1949 |
| 54I | 277 | S | Smithy | 1900 |
| 55I | 282 | S | Smithy | 1872 |
| 56J | 308 | E | Unspecified Heap | 1949 |
| 57J | 309 | E | Unspecified Heap | 1938 |
| 58J | 309 | E | Unspecified Heap | 1938 |
| 59J | 310 | E | Unspecified Heap | 1910 |
| 60J | 311 | E | Unspecified Heap | 1960 |
| 61J | 316 | E | Refuse Heap | 1872 |
| 62J | 319 | E | Unspecified Old Shafts | 1949 |
| 63J | 319 | E | Unspecified Old Shafts | 1910 |
| 64J | 320 | E | Unspecified Old Shafts | 1960 |
| 65J | 321 | E | Unspecified Old Shafts | 1938 |
| 66J | 321 | E | Unspecified Old Shafts | 1938 |
| 67J | 325 | E | Unspecified Old Shafts | 1900 |
| 68K | 338 | E | Unspecified Old Shaft | 1949 |
| 69K | 340 | E | Unspecified Old Shaft | 1910 |
| 70K | 340 | E | Unspecified Old Shaft | 1938 |
| 71K | 340 | E | Unspecified Old Shaft | 1938 |
| 72K | 340 | E | Unspecified Disused Shaft | 1974 |
| 73K | 340 | E | Unspecified Disused Shaft | 1989 |
| 74K | 340 | E | Unspecified Disused Shaft | 1985 |
| 75K | 340 | E | Unspecified Old Shaft | 1960 |
| 76L | 349 | SE | Old Colliery | 1910 |
| 77L | 349 | SE | Colliery | 1938 |
| 78L | 349 | SE | Colliery | 1938 |

| | | | | |
|------|-----|----|-----------------------------|------|
| 79AA | 351 | SE | Old Colliery | 1949 |
| 80L | 352 | SE | Unspecified Ground Workings | 1910 |
| 81L | 353 | SE | Unspecified Heap | 1938 |
| 82L | 353 | SE | Unspecified Heap | 1938 |
| 83L | 353 | SE | Unspecified Ground Workings | 1949 |
| 84L | 354 | SE | Unspecified Heap | 1960 |
| 85M | 356 | SE | Unspecified Old Shaft | 1938 |
| 86M | 356 | SE | Unspecified Old Shaft | 1938 |
| 87M | 357 | SE | Unspecified Disused Shafts | 1974 |
| 88M | 357 | SE | Unspecified Disused Shafts | 1985 |
| 89M | 358 | SE | Unspecified Old Shaft | 1910 |
| 90M | 358 | SE | Unspecified Old Shaft | 1949 |
| 91AB | 359 | SE | Unspecified Old Shaft | 1900 |
| 92N | 360 | E | Unspecified Ground Workings | 1938 |
| 93N | 360 | E | Unspecified Ground Workings | 1938 |
| 94M | 360 | SE | Unspecified Old Shaft | 1900 |
| 95N | 361 | E | Unspecified Heap | 1949 |
| 96M | 361 | SE | Unspecified Old Shaft | 1960 |
| 97N | 366 | E | Unspecified Heap | 1872 |
| 98N | 367 | E | Unspecified Heap | 1960 |
| 99O | 376 | SE | Unspecified Disused Shafts | 1985 |
| 100O | 376 | SE | Unspecified Disused Shafts | 1974 |
| 101P | 409 | E | Unspecified Heap | 1949 |
| 102P | 409 | E | Unspecified Heap | 1910 |
| 103P | 411 | E | Unspecified Heap | 1938 |
| 104P | 411 | E | Unspecified Heap | 1938 |
| 105P | 412 | E | Unspecified Heap | 1960 |
| 106P | 414 | E | Unspecified Heap | 1872 |
| 107Q | 419 | E | Unspecified Old Shafts | 1949 |
| 108P | 419 | E | Refuse Heap | 1900 |
| 109Q | 420 | E | Unspecified Old Shafts | 1910 |
| 110N | 421 | E | Unspecified Old Shafts | 1938 |
| 111N | 421 | E | Unspecified Old Shafts | 1938 |
| 112Q | 422 | E | Unspecified Old Shafts | 1960 |
| 113R | 426 | S | Refuse Heap | 1900 |
| 114Q | 426 | E | Unspecified Old Shafts | 1900 |
| 115R | 433 | S | Unspecified Heap | 1938 |
| 116R | 433 | S | Unspecified Heap | 1938 |
| 117R | 435 | S | Unspecified Heaps | 1910 |
| 118R | 435 | S | Refuse Heap | 1872 |

| | | | | |
|-------|-----|---|-----------------------|------|
| 119R | 435 | S | Unspecified Heap | 1949 |
| 120R | 441 | S | Unspecified Heap | 1960 |
| 121R | 449 | S | Unspecified Shaft | 1900 |
| 122R | 455 | S | Unspecified Old Shaft | 1938 |
| 123R | 455 | S | Unspecified Old Shaft | 1938 |
| 124R | 457 | S | Unspecified Shaft | 1949 |
| 125R | 458 | S | Unspecified Tank | 1910 |
| 126R | 459 | S | Coal Shaft | 1872 |
| 127S | 461 | S | Unspecified Heap | 1938 |
| 128S | 461 | S | Unspecified Heap | 1938 |
| 129S | 462 | S | Unspecified Heap | 1949 |
| 130T | 476 | N | Cuttings | 1872 |
| 131T | 479 | N | Cuttings | 1900 |
| 132U | 481 | E | Unspecified Pit | 1960 |
| 133U | 484 | E | Unspecified Pit | 1938 |
| 134U | 484 | E | Unspecified Pit | 1938 |
| 135U | 485 | E | Unspecified Pit | 1949 |
| 136T | 491 | N | Cuttings | 1910 |
| 137T | 492 | N | Cuttings | 1938 |
| 138T | 495 | N | Cuttings | 1949 |
| 139T | 498 | N | Cuttings | 1960 |
| 140T | 498 | N | Cuttings | 1974 |
| 141T | 498 | N | Cuttings | 1985 |
| 142T | 498 | N | Cuttings | 1989 |
| 143AC | 499 | E | Unspecified Heap | 1872 |

1.2 Additional Information – Historical Tank Database

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

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

2

| ID | Distance (m) | Direction | Use | Date |
|------|--------------|-----------|------------------|------|
| 144V | 109 | SW | Unspecified Tank | 1962 |
| 145 | 448 | N | Unspecified Tank | 1993 |

1.3 Additional Information – Historical Energy Features Database

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

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

6

| ID | Distance (m) | Direction | Use | Date |
|------|--------------|-----------|------------------------|------|
| 146W | 165 | S | Electricity Substation | 1989 |
| 147W | 165 | S | Electricity Substation | 1984 |
| 148W | 165 | S | Electricity Substation | 1993 |
| 149X | 330 | S | Electricity Substation | 1993 |
| 150X | 331 | S | Electricity Substation | 1989 |
| 151X | 331 | S | Electricity Substation | 1984 |

1.4 Additional Information – Historical Petrol and Fuel Site Database

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

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

0

Database searched and no data found.

1.5 Additional Information – Historical Garage and Motor Vehicle Repair Database

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

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

4

| ID | Distance (m) | Direction | Use | Date |
|------|--------------|-----------|--------|------|
| 152Y | 309 | S | Garage | 1993 |
| 153Y | 309 | S | Garage | 1962 |
| 154Y | 322 | S | Garage | 1989 |
| 155Y | 322 | S | Garage | 1984 |

1.6 Potentially Infilled Land

Records of Potentially Infilled Features from 1:10,000 scale mapping within 500m of the study site: 120

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

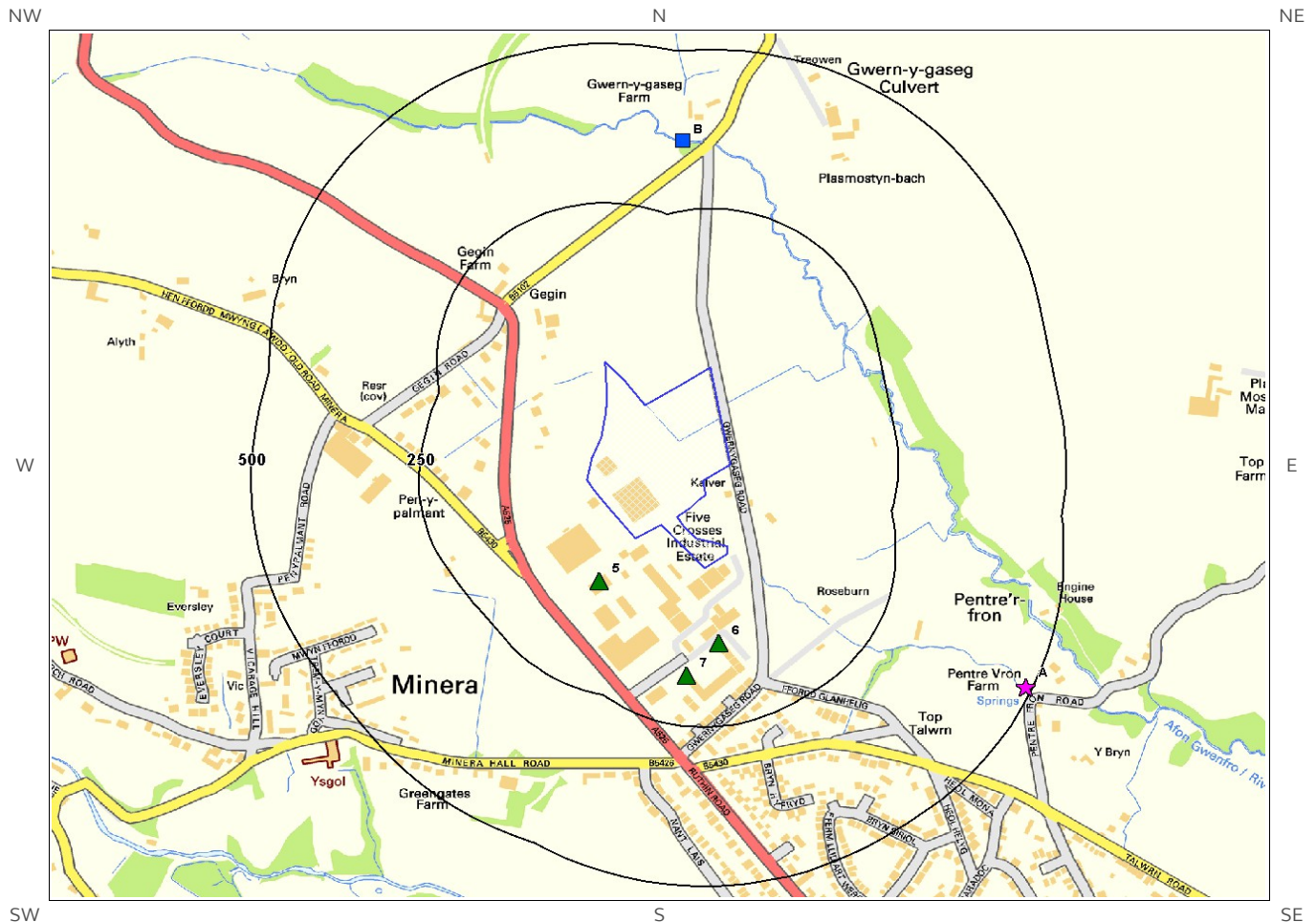
| ID | Distance(m) | Direction | Use | Date |
|------|-------------|-----------|------------------|------|
| 156D | 41 | SW | Unspecified Heap | 1938 |
| 157D | 41 | SW | Unspecified Heap | 1938 |
| 158D | 42 | SW | Unspecified Heap | 1900 |

| | | | | |
|------|-----|----|-----------------------------|------|
| 159D | 42 | SW | Unspecified Ground Workings | 1910 |
| 160D | 43 | SW | Unspecified Heap | 1949 |
| 161D | 44 | SW | Unspecified Heap | 1960 |
| 162D | 44 | SW | Unspecified Heap | 1985 |
| 163D | 44 | SW | Unspecified Heap | 1989 |
| 164D | 44 | SW | Unspecified Heap | 1974 |
| 165E | 52 | SW | Unspecified Heap | 1974 |
| 166E | 52 | SW | Unspecified Heap | 1985 |
| 167E | 55 | S | Unspecified Heap | 1900 |
| 168E | 56 | SW | Unspecified Heap | 1938 |
| 169E | 56 | SW | Unspecified Heap | 1938 |
| 170E | 59 | SW | Unspecified Ground Workings | 1910 |
| 171E | 61 | SW | Unspecified Heap | 1949 |
| 172E | 62 | SW | Unspecified Heap | 1960 |
| 173F | 130 | S | Unspecified Old Shaft | 1938 |
| 174F | 130 | S | Unspecified Old Shaft | 1938 |
| 175F | 131 | S | Unspecified Old Shaft | 1910 |
| 176F | 132 | SE | Unspecified Old Shaft | 1900 |
| 177F | 132 | S | Unspecified Old Shaft | 1949 |
| 178F | 134 | S | Unspecified Old Shaft | 1960 |
| 179F | 134 | S | Unspecified Disused Shaft | 1974 |
| 180F | 134 | S | Unspecified Disused Shaft | 1985 |
| 181Z | 288 | W | Pond | 1974 |
| 182Z | 288 | W | Pond | 1985 |
| 183Z | 293 | W | Reservoir | 1900 |
| 184Z | 298 | W | Reservoir | 1872 |
| 185Z | 299 | W | Reservoir | 1949 |
| 186Z | 300 | W | Reservoir | 1938 |
| 187J | 308 | E | Unspecified Heap | 1949 |
| 188J | 309 | E | Unspecified Heap | 1938 |
| 189J | 309 | E | Unspecified Heap | 1938 |
| 190J | 310 | E | Unspecified Heap | 1910 |
| 191J | 311 | E | Unspecified Heap | 1960 |
| 192J | 316 | E | Refuse Heap | 1872 |
| 193J | 319 | E | Unspecified Old Shafts | 1949 |
| 194J | 319 | E | Unspecified Old Shafts | 1910 |
| 195J | 320 | E | Unspecified Old Shafts | 1960 |
| 196J | 321 | E | Unspecified Old Shafts | 1938 |
| 197J | 321 | E | Unspecified Old Shafts | 1938 |
| 198J | 325 | E | Unspecified Old Shafts | 1900 |
| 199K | 338 | E | Unspecified Old Shaft | 1949 |
| 200K | 340 | E | Unspecified Old Shaft | 1910 |
| 201K | 340 | E | Unspecified Old Shaft | 1938 |
| 202K | 340 | E | Unspecified Old Shaft | 1938 |















| | | | | |
|-------|-----|----|-----------------------------|------|
| 203K | 340 | E | Unspecified Disused Shaft | 1985 |
| 204K | 340 | E | Unspecified Disused Shaft | 1989 |
| 205K | 340 | E | Unspecified Disused Shaft | 1974 |
| 206K | 340 | E | Unspecified Old Shaft | 1960 |
| 207L | 349 | SE | Old Colliery | 1910 |
| 208L | 349 | SE | Colliery | 1938 |
| 209L | 349 | SE | Colliery | 1938 |
| 210 | 351 | N | Pond | 1872 |
| 211AA | 351 | SE | Old Colliery | 1949 |
| 212L | 352 | SE | Unspecified Ground Workings | 1910 |
| 213L | 353 | SE | Unspecified Heap | 1938 |
| 214L | 353 | SE | Unspecified Heap | 1938 |
| 215L | 353 | SE | Unspecified Ground Workings | 1949 |
| 216AB | 354 | SE | Unspecified Heap | 1960 |
| 217M | 356 | SE | Unspecified Old Shaft | 1938 |
| 218M | 356 | SE | Unspecified Old Shaft | 1938 |
| 219M | 357 | SE | Unspecified Disused Shafts | 1974 |
| 220M | 357 | SE | Unspecified Disused Shafts | 1985 |
| 221M | 358 | SE | Unspecified Old Shaft | 1910 |
| 222M | 358 | SE | Unspecified Old Shaft | 1949 |
| 223AB | 359 | SE | Unspecified Old Shaft | 1900 |
| 224N | 360 | E | Unspecified Ground Workings | 1938 |
| 225N | 360 | E | Unspecified Ground Workings | 1938 |
| 226M | 360 | SE | Unspecified Old Shaft | 1900 |
| 227Q | 361 | E | Unspecified Heap | 1949 |
| 228M | 361 | SE | Unspecified Old Shaft | 1960 |
| 229Q | 366 | E | Unspecified Heap | 1872 |
| 230Q | 367 | E | Unspecified Heap | 1960 |
| 231O | 376 | SE | Unspecified Disused Shafts | 1985 |
| 232O | 376 | SE | Unspecified Disused Shafts | 1974 |
| 233P | 409 | E | Unspecified Heap | 1949 |
| 234P | 409 | E | Unspecified Heap | 1910 |
| 235P | 411 | E | Unspecified Heap | 1938 |
| 236P | 411 | E | Unspecified Heap | 1938 |
| 237P | 412 | E | Unspecified Heap | 1960 |
| 238P | 414 | E | Unspecified Heap | 1872 |
| 239Q | 419 | E | Unspecified Old Shafts | 1949 |
| 240P | 419 | E | Refuse Heap | 1900 |
| 241Q | 420 | E | Unspecified Old Shafts | 1910 |
| 242Q | 421 | E | Unspecified Old Shafts | 1938 |

| | | | | |
|-------|-----|----|------------------------|------|
| 243Q | 421 | E | Unspecified Old Shafts | 1938 |
| 244Q | 422 | E | Unspecified Old Shafts | 1960 |
| 245R | 426 | S | Refuse Heap | 1900 |
| 246Q | 426 | E | Unspecified Old Shafts | 1900 |
| 247R | 433 | S | Unspecified Heap | 1938 |
| 248R | 433 | S | Unspecified Heap | 1938 |
| 249S | 435 | S | Unspecified Heaps | 1910 |
| 250R | 435 | S | Refuse Heap | 1872 |
| 251R | 435 | S | Unspecified Heap | 1949 |
| 252S | 441 | S | Unspecified Heap | 1960 |
| 253R | 449 | S | Unspecified Shaft | 1900 |
| 254R | 455 | S | Unspecified Old Shaft | 1938 |
| 255R | 455 | S | Unspecified Old Shaft | 1938 |
| 256R | 457 | S | Unspecified Shaft | 1949 |
| 257R | 459 | S | Coal Shaft | 1872 |
| 258S | 461 | S | Unspecified Heap | 1938 |
| 259S | 461 | S | Unspecified Heap | 1938 |
| 260 | 462 | SW | Pond | 1872 |
| 261S | 462 | S | Unspecified Heap | 1949 |
| 262T | 476 | N | Cuttings | 1872 |
| 263T | 479 | N | Cuttings | 1900 |
| 264U | 481 | E | Unspecified Pit | 1960 |
| 265U | 484 | E | Unspecified Pit | 1938 |
| 266U | 484 | E | Unspecified Pit | 1938 |
| 267U | 485 | E | Unspecified Pit | 1949 |
| 268T | 491 | N | Cuttings | 1910 |
| 269T | 492 | N | Cuttings | 1938 |
| 270T | 495 | N | Cuttings | 1949 |
| 271T | 498 | N | Cuttings | 1989 |
| 272T | 498 | N | Cuttings | 1985 |
| 273T | 498 | N | Cuttings | 1974 |
| 274T | 498 | N | Cuttings | 1960 |
| 275AC | 499 | E | Unspecified Heap | 1872 |

2. Environmental Permits, Incidents and Registers Map



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

2. Environmental Permits, Incidents and Registers

2.1 Industrial Sites Holding Licences and/or Authorisations

Searches of information provided by the Environment Agency and Local Authorities reveal the following information:

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

0

Database searched and no data found.

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

0

Database searched and no data found.

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

0

Database searched and no data found.

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

0

Database searched and no data found.

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

0

Database searched and no data found.

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

3

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

| ID | Distance (m) | Direction | NGR | Details |
|----|--------------|-----------|------------------|--|
| 5 | 88 | SW | 327680 352075 | Address: Minera Building Supplies Ltd, Five Crosses Industrial Estate, Ruthin Road, Minera, Wrexham, LL11 3RD Process: Mineral Process Status: Current Permit Permit Type: Part B Enforcement: No Enforcement Notified. Date of Enforcement: No Enforcement Notified. Comment: No Enforcement Notified. |
| 6 | 123 | S | 327858 351977 | Address: Jones Automotive Services, Minera Garage, Unit 30, Five Crosses Industrial Estate, Minera, Wrexham, LL11 3RD Process: Waste Oil Burning Process Status: New Legislation Applies Permit Type: Part B Enforcement: No Enforcement Notified. Date of Enforcement: No Enforcement Notified. Comment: No Enforcement Notified. |
| 7 | 174 | S | 327810 351926 | Address: Minera Tyres and Exhausts Ltd, Unit 36, Five Crosses Industrial Estate, Minera, Wrexham, LL11 3RD Process: Waste Oil Burning Process Status: New Legislation Applies Permit Type: Part B Enforcement: No Enforcement Notified. Date of Enforcement: No Enforcement Notified. Comment: No Enforcement Notified. |

2.1.7 Records of Category 3 or 4 Radioactive Substances Authorisations:

0

Database searched and no data found.

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

2

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

| ID | Distance (m) | Direction | NGR | Details |
|----|--------------|-----------|------------------|---|
| 3B | 358 | N | 327805 352768 | Address: BARN A & B, GWERN Y GASEG FARM, MINERA ROAD, MINERA, WREXHAM, CLWYD, LL11 3AJ Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY Permit Number: NPSWQD005307 Permit Version: 1 Receiving Water: Status: NEW CONSENT (WRA 91, S88 & SCHED 10 AS AMENDED BY ENV ACT 1995) Issue date: 26/11/2008 Effective Date: 26-Nov-2008 Revocation Date: - |

| ID | Distance (m) | Direction | NGR | Details |
|----|--------------|-----------|------------------|---|
| 4B | 358 | N | 327805 352768 | <p>Address: BARN A & B, GWERN Y GASEG FARM, MINERA ROAD, MINERA, WREXHAM, CLWYD, LL11 3AJ</p> <p>Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY</p> <p>Permit Number: NPSWQD005307 Permit Version: 1</p> <p>Receiving Water: Status: NEW CONSENT (WRA 91, S88 & SCHED 10 AS AMENDED BY ENV ACT 1995) Issue date: 26/11/2008 Effective Date: 26-Nov-2008 Revocation Date: -</p> |

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

0

Database searched and no data found.

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

0

Database searched and no data found.

2.2 Dangerous or Hazardous Sites

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

0

Database searched and no data found.

2.3 Environment Agency Recorded Pollution Incidents

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

2

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

| ID | Distance (m) | Direction | NGR | Details |
|----|--------------|-----------|------------------|---|
| 1A | 489 | SE | 328314 351911 | <p>Incident Date: 13-Mar-2003 Incident Identification: 142816 Pollutant: Sewage Materials Pollutant Description: Other Sewage Material</p> <p>Water Impact: Category 3 (Minor) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)</p> |

| ID | Distance (m) | Direction | NGR | Details | |
|----|--------------|-----------|------------------|--|---|
| 2A | 489 | SE | 328314 351911 | Incident Date: 13-Mar-2003 Incident Identification: 142816 Pollutant: Sewage Materials Pollutant Description: Other Sewage Material | Water Impact: Category 3 (Minor) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact) |

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

0

Database searched and no data found.

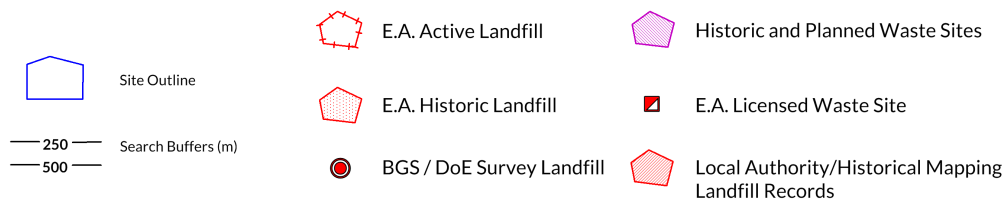
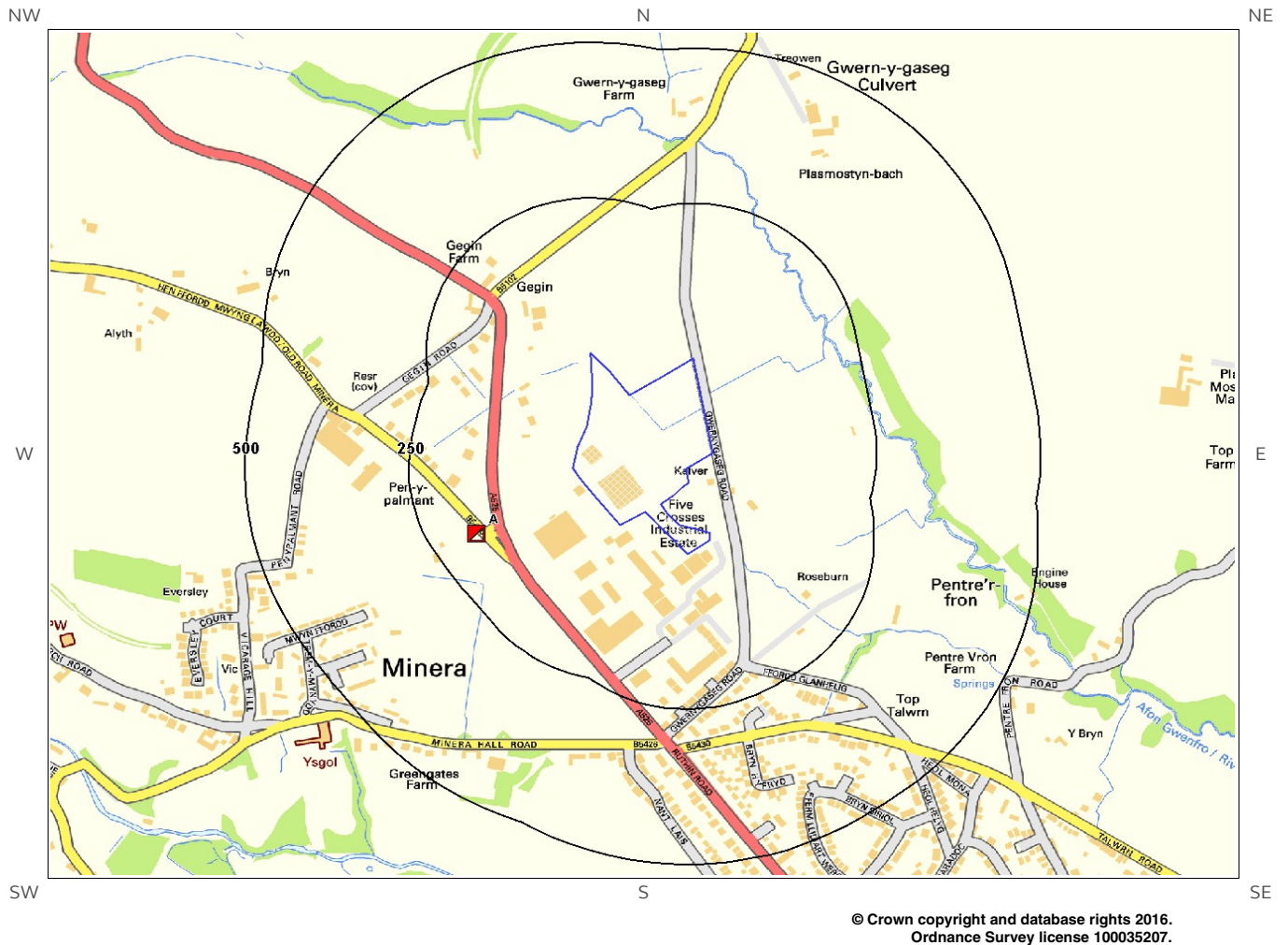
2.4 Sites Determined as Contaminated Land under Part 2A EPA 1990

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

0

Database searched and no data found.

3. Landfill and Other Waste Sites Map



3. Landfill and Other Waste Sites

3.1 Landfill Sites

3.1.1 Records from Environment Agency landfill data within 1000m of the study site:

0

Database searched and no data found.

3.1.2 Records of Environment Agency historic landfill sites within 1500m of the study site:

4

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

| ID | Distance (m) | Direction | NGR | Details | |
|-----------|--------------|-----------|------------------|--|---|
| Not shown | 735 | N | 327800 353100 | Site Address: Pentre Saeson Foundry, Brymbo Road, Wrexham, Bwlchgwyn Waste Licence: Yes Site Reference: WMBC L/20 Waste Type: Industrial Environmental Permitting Regulations (Waste) Reference: - | Licence Issue: 29-Sep-1977 Licence Surrendered: 31-Dec-1989 Licence Holder Address: - Operator: - Licence Holder: Taylor Brothers First Recorded: 31-Dec-1935 Last Recorded: 31-Dec-1985 |
| Not shown | 1271 | E | 329100 352100 | Site Address: Peniel House, Peniel, Wrexham, Fron Waste Licence: Yes Site Reference: WMBC L/27 Waste Type: Inert Environmental Permitting Regulations (Waste) Reference: - | Licence Issue: 29-Feb-1980 Licence Surrendered: 28-Feb-1982 Licence Holder Address: - Operator: - Licence Holder: Mr P Dempsey First Recorded: 31-Dec-1980 Last Recorded: 28-Feb-1982 |
| Not shown | 1396 | NE | 329641 352527 | Site Address: Works Bank, Brymbo, Lodge, Wrexham Waste Licence: Yes Site Reference: - Waste Type: Industrial Environmental Permitting Regulations (Waste) Reference: WU1/L/BRI001 | Licence Issue: 19-Jul-1977 Licence Surrendered: 19-May-2008 Licence Holder Address: Parkhill House, Newport, 133 High Street, Shropshire Operator: Brymbo Steel Works Ltd Licence Holder: Brymbo Steel Works Ltd First Recorded: 30-Dec-1899 Last Recorded: - |
| Not shown | 1438 | NE | 329000 353400 | Site Address: Brymbo Steelworks, Wrexham, Brymbo Waste Licence: Yes Site Reference: WMBC L/11 Waste Type: Industrial, Special, Liquid sludge Environmental Permitting Regulations (Waste) Reference: - | Licence Issue: 19-Jul-1977 Licence Surrendered: 31-Dec-1990 Licence Holder Address: - Operator: - Licence Holder: Brymbo Steel Works Limited First Recorded: 31-Dec-1940 Last Recorded: 31-Dec-1985 |

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

0

Database searched and no data found.

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

1

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

| ID | Distance (m) | Direction | NGR | Site Address | Source | Data Type |
|-----------|--------------|-----------|------------------|--------------|--------------|-----------|
| Not shown | 1013 | E | 328915 352249 | Refuse Tip | 1961 mapping | Polygon |

3.2 Other Waste Sites

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

0

Database searched and no data found.

3.2.2 Records of Environment Agency licensed waste sites within 1500m of the study site:

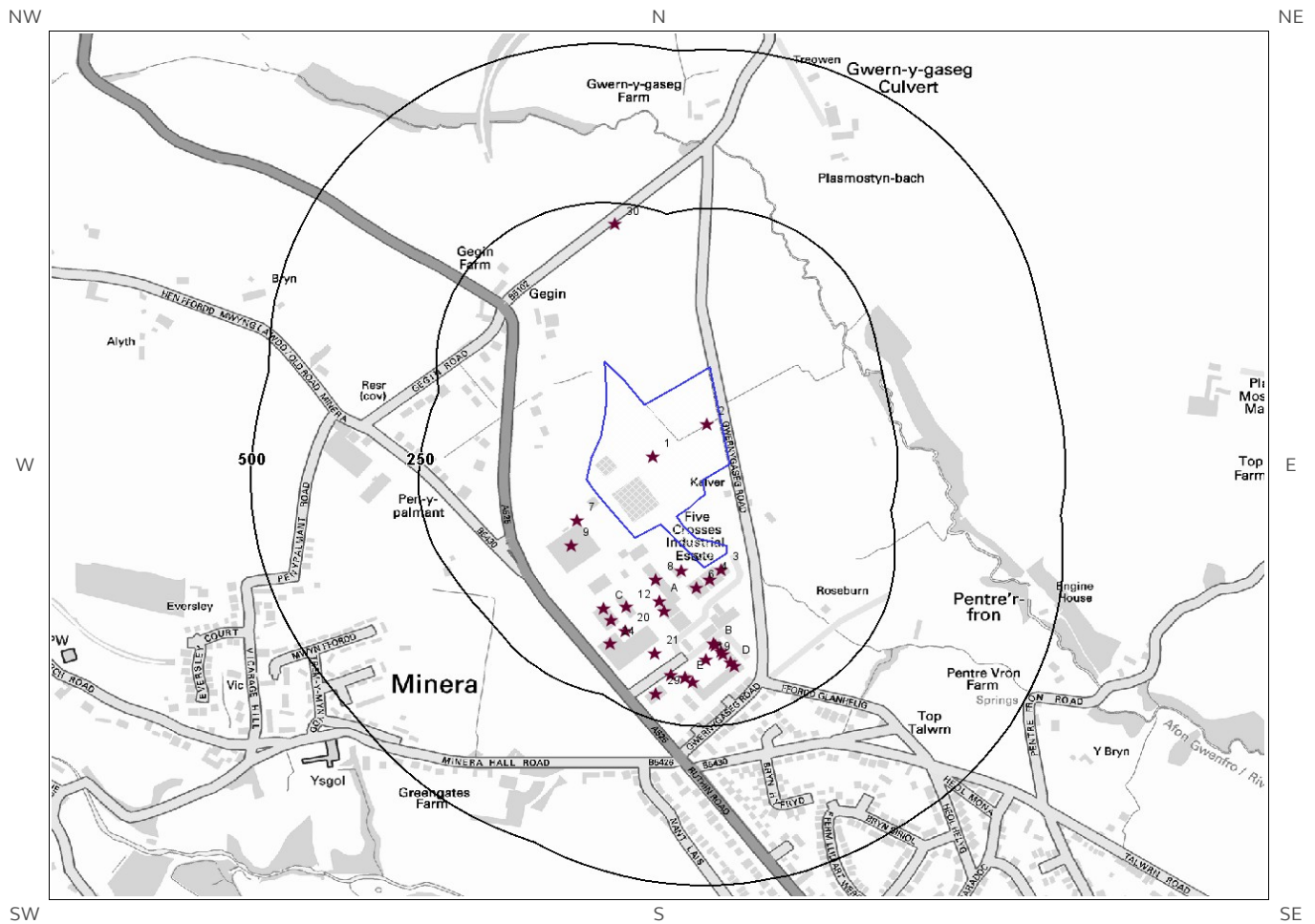
5

The following waste treatment, transfer or disposal sites records are represented as points on the Landfill and Other Waste Sites map:

| ID | Distance (m) | Direction | NGR | Details |
|----|--------------|-----------|------------------|--|
| 5A | 181 | SW | 327515 352131 | <p>Site Address: Station House, Old Road, Minera, Wrexham, Clwyd, LL11 3YQ Type: Household, Commercial & Industrial Waste T Stn Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: SKM001 EPR reference: JP3694FP/A001 Operator: S And K Matthews Skip Hire Waste Management licence No: 37287 Annual Tonnage: 4500.0</p> <p>Issue Date: 29/11/2005 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued Site Name: S And K Matthews Skip Hire Correspondence Address: -</p> |

| ID | Distance (m) | Direction | NGR | Details |
|-----------|--------------|-----------|------------------|--|
| 6A | 181 | SW | 327515 352131 | <p>Site Address: S And K Matthews Skip Hire, Minera, Wrexham, Wrexham, LL11 3YQ</p> <p>Type: -</p> <p>Size: Unknown</p> <p>Environmental Permitting Regulations (Waste) Licence Number: JP3694FP</p> <p>EPR reference: -</p> <p>Operator: S And K Matthews Skip Hire</p> <p>Waste Management licence No: 0</p> <p>Annual Tonnage: 5000.0</p> <p>Issue Date: 29/11/2005</p> <p>Effective Date: 29/11/2005</p> <p>Modified: -</p> <p>Surrendered Date: -</p> <p>Expiry Date: -</p> <p>Cancelled Date: -</p> <p>Status: Effective</p> <p>Site Name: -</p> <p>Correspondence Address: -</p> |
| Not shown | 1054 | SW | 327254 351206 | <p>Site Address: Marions House, New Brighton, Minera, Wrexham, Clwyd, LL11 3DS</p> <p>Type: Metal Recycling Site (Vehicle Dismantler)</p> <p>Size: < 25000 tonnes</p> <p>Environmental Permitting Regulations (Waste) Licence Number: HKM001</p> <p>EPR reference: EA/EPR/XP3394FK/V005</p> <p>Operator: Williams Henry Kingsley</p> <p>Waste Management licence No: 37059</p> <p>Annual Tonnage: 4999.0</p> <p>Issue Date: 16/02/1993</p> <p>Effective Date: -</p> <p>Modified: 28/01/2013</p> <p>Surrendered Date: -</p> <p>Expiry Date: -</p> <p>Cancelled Date: -</p> <p>Status: Modified</p> <p>Site Name: H K Motors</p> <p>Correspondence Address: -</p> |
| Not shown | 1054 | SW | 327254 351206 | <p>Site Address: Marions House, New Brighton, Minera, Wrexham, Clwyd, LL11 3DS</p> <p>Type: Metal Recycling Site (Vehicle Dismantler)</p> <p>Size: Unknown</p> <p>Environmental Permitting Regulations (Waste) Licence Number: HKM001</p> <p>EPR reference: XP3394FK/V005</p> <p>Operator: Williams Henry Kingsley</p> <p>Waste Management licence No: 37059</p> <p>Annual Tonnage: 0.0</p> <p>Issue Date: 16/02/1993</p> <p>Effective Date: -</p> <p>Modified: 28/01/2013</p> <p>Surrendered Date: -</p> <p>Expiry Date: -</p> <p>Cancelled Date: -</p> <p>Status: Modified</p> <p>Site Name: H K Motors</p> <p>Correspondence Address: -</p> |
| Not shown | 1054 | SW | 327254 351206 | <p>Site Address: H K Motors, New Brighton, Minera, Wrexham, LL11 3DS</p> <p>Type: -</p> <p>Size: Unknown</p> <p>Environmental Permitting Regulations (Waste) Licence Number: XP3394FK</p> <p>EPR reference: -</p> <p>Operator: Henry Kingsley Williams</p> <p>Waste Management licence No: 0</p> <p>Annual Tonnage: 4999.0</p> <p>Issue Date: 16/02/1993</p> <p>Effective Date: 16/02/1993</p> <p>Modified: -</p> <p>Surrendered Date: -</p> <p>Expiry Date: -</p> <p>Cancelled Date: -</p> <p>Status: Effective</p> <p>Site Name: -</p> <p>Correspondence Address: -</p> |

4. Current Land Use Map



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4. Current Land Uses

4.1 Current Industrial Data

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

30

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

| ID | Distance (m) | Direction | Company | NGR | Address | Activity | Category |
|-----|--------------|-----------|---|------------------|---|--|---|
| 1 | 0 | On Site | Electricity Sub Station | 327760 352273 | LL11 | Electrical Features | Infrastructure and Facilities |
| 2 | 0 | On Site | Pylon | 327841 352324 | LL11 | Electrical Features | Infrastructure and Facilities |
| 3 | 16 | SE | Alpine Engineering Ltd | 327862 352095 | Unit 9, Five Crosses Industrial Estate, Minera, Wrexham, LL11 3RD | Industrial Engineers | Engineering Services |
| 4 | 20 | SE | Strafford's Coaches | 327845 352079 | Unit 7-8, Five Crosses Industrial Estate, Minera, Wrexham, LL11 3RD | Bus and Coach Stations, Depots and Companies | Public Transport, Stations and Infrastructure |
| 5 | 27 | SW | Industrial Estate | 327803 352094 | LL11 | Business Parks and Industrial Estates | Industrial Features |
| 6 | 33 | S | Industrial Engineering Services Wrexham Ltd | 327825 352066 | Unit 5, Five Crosses Industrial Estate, Minera, Wrexham, LL11 3RD | Industrial Engineers | Engineering Services |
| 7 | 48 | SW | Electricity Sub Station | 327648 352173 | LL11 | Electrical Features | Infrastructure and Facilities |
| 8 | 65 | SW | D S W | 327764 352079 | Unit 4, Five Crosses Industrial Estate, Minera, Wrexham, LL11 3RD | Electronic Equipment | Industrial Products |
| 9 | 80 | SW | The Village Bakery Ltd | 327638 352133 | Five Crosses Industrial Estate, Minera, Wrexham, LL11 3RD | Baking and Confectionery | Foodstuffs |
| 10A | 84 | SW | C A M Gas | 327770 352045 | Five Crosses Industrial Estate, Minera, Wrexham, LL11 3RD | Fuel Distributors and Suppliers | Household, Office, Leisure and Garden |
| 11A | 90 | SW | Site Solutions Engineering Ltd | 327777 352030 | Unit 1, Five Crosses Industrial Estate, Minera, Wrexham, LL11 3RD | Industrial Engineers | Engineering Services |
| 12 | 108 | S | A & C Pierce | 327721 352036 | Unit C, Five Crosses Industrial Estate, Minera, Wrexham, LL11 3RD | Vehicle Repair, Testing and Servicing | Repair and Servicing |
| 13C | 119 | SW | C J C Motor Services | 327687 352034 | Unit K-L, Five Crosses Industrial Estate, Minera, Wrexham, LL11 3RD | Vehicle Repair, Testing and Servicing | Repair and Servicing |
| 14B | 119 | S | A & P Autopanel | 327851 351979 | Unit 31, Five Crosses Industrial Estate, Minera, Wrexham, LL11 3RD | Vehicle Parts and Accessories | Motoring |
| 15B | 124 | S | Minera Garage | 327853 351975 | Unit 30, Five Crosses Industrial Estate, Minera, Wrexham, LL11 3RD | Vehicle Repair, Testing and Servicing | Repair and Servicing |

| ID | Distance (m) | Direction | Company | NGR | Address | Activity | Category |
|-----|--------------|-----------|-----------------------------|------------------|---|---|-------------------------------|
| 16C | 133 | S | Fat Dubbers | 327699 352016 | Unit G, Five Crosses Industrial Estate, Minera, Wrexham, LL11 3RD | Vehicle Repair, Testing and Servicing | Repair and Servicing |
| 17B | 134 | S | Wrexham Installations | 327862 351966 | Unit 28-29, Five Crosses Industrial Estate, Minera, Wrexham, LL11 3RD | Lifting and Handling Equipment | Industrial Products |
| 18B | 139 | S | Minera M O T Centre | 327865 351961 | Unit 27, Five Crosses Industrial Estate, Minera, Wrexham, LL11 3RD | Vehicle Repair, Testing and Servicing | Repair and Servicing |
| 19 | 144 | S | Gas Valve Compound | 327839 351954 | LL11 | Gas Features | Infrastructure and Facilities |
| 20 | 146 | S | Pylon | 327720 351999 | LL11 | Electrical Features | Infrastructure and Facilities |
| 21 | 153 | SW | Industrial Estate | 327764 351964 | LL11 | Business Parks and Industrial Estates | Industrial Features |
| 22D | 154 | S | T R Ogden Auto Body Repairs | 327876 351948 | Unit 24, Five Crosses Industrial Estate, Minera, Wrexham, LL11 3RD | Vehicle Repair, Testing and Servicing | Repair and Servicing |
| 23D | 160 | S | D C Autos | 327881 351944 | Unit 23, Five Crosses Industrial Estate, Minera, Wrexham, LL11 3RD | Vehicle Repair, Testing and Servicing | Repair and Servicing |
| 24 | 169 | S | F W B Cymru Ltd | 327697 351978 | Five Crosses Industrial Estate, Minera, Wrexham, LL11 3RD | General Construction Supplies | Industrial Products |
| 25E | 175 | S | Minera Tyres & Exhausts | 327808 351925 | Unit 36, Five Crosses Industrial Estate, Minera, Wrexham, LL11 3RD | Vehicle Parts and Accessories | Motoring |
| 26E | 175 | S | HiQ Centre | 327808 351925 | Unit 36, Five Crosses Industrial Estate, Minera, Wrexham, LL11 3RD | Vehicle Repair, Testing and Servicing | Repair and Servicing |
| 27E | 176 | S | Electricity Sub Station | 327788 351929 | LL11 | Electrical Features | Infrastructure and Facilities |
| 28E | 181 | S | Wrexham Auto Kraft | 327820 351918 | Unit 35, Five Crosses Industrial Estate, Minera, Wrexham, LL11 3RD | Vehicle Repair, Testing and Servicing | Repair and Servicing |
| 29 | 211 | S | Reclaim Services | 327764 351900 | Unit 50, Five Crosses Industrial Estate, Minera, Wrexham, LL11 3RD | Colours, Chemicals and Water Softeners and Supplies | Industrial Products |
| 30 | 218 | N | Pylon | 327704 352638 | LL11 | Electrical Features | Infrastructure and Facilities |

4.2 Petrol and Fuel Sites

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

0

Database searched and no data found.

4.3 National Grid High Voltage Underground Electricity Transmission Cables

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

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

0

Database searched and no data found.

4.4 National Grid High Pressure Gas Transmission Pipelines

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

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

0

Database searched and no data found.

5. Geology

5.1 Artificial Ground and Made Ground

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

| Lex Code | Description | Rock Type |
|----------|-------------------------|--------------------|
| MGR-MGRD | MADE GROUND (UNDIVIDED) | ARTIFICIAL DEPOSIT |

5.2 Superficial Ground and Drift Geology

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

| Lex Code | Description | Rock Type |
|----------|-----------------|-----------|
| TILLD | TILL, DEVENSIAN | DIAMICTON |

5.3 Bedrock and Solid Geology

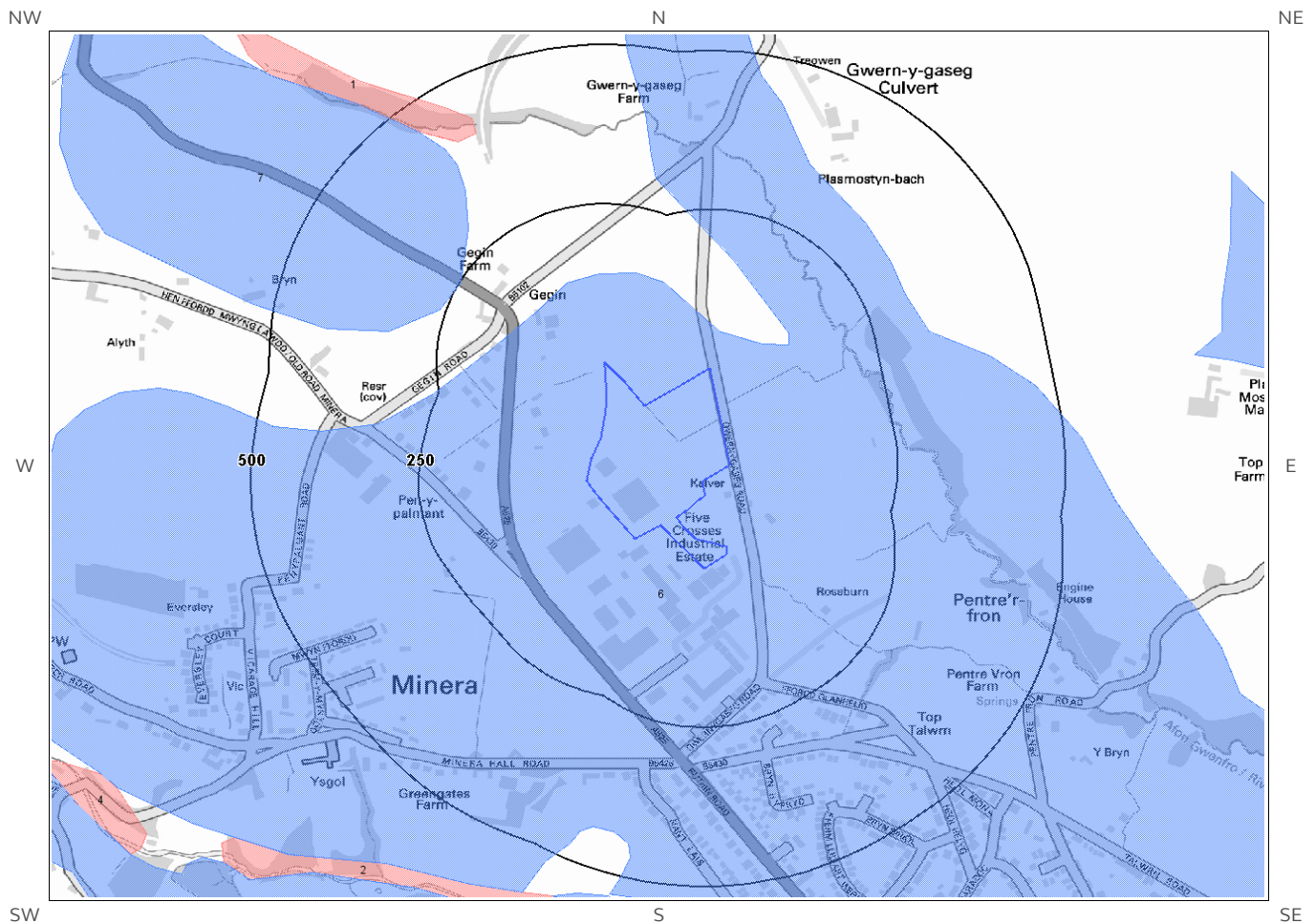
The database has been searched on site, including a 50m buffer.

| Lex Code | Description | Rock Type |
|-----------|---|-----------------------------------|
| PLMC-SDST | PENNINE LOWER COAL MEASURES FORMATION AND PENNINE MIDDLE COAL MEASURES FORMATION (UNDIFFERENTIATED) | SANDSTONE |
| PLMC-MDSS | PENNINE LOWER COAL MEASURES FORMATION AND PENNINE MIDDLE COAL MEASURES FORMATION (UNDIFFERENTIATED) | MUDSTONE, SILTSTONE AND SANDSTONE |
| PLMC-MDSS | PENNINE LOWER COAL MEASURES FORMATION AND PENNINE MIDDLE COAL MEASURES FORMATION (UNDIFFERENTIATED) | MUDSTONE, SILTSTONE AND SANDSTONE |
| PLMC-MDSS | PENNINE LOWER COAL MEASURES FORMATION AND PENNINE MIDDLE COAL MEASURES FORMATION (UNDIFFERENTIATED) | MUDSTONE, SILTSTONE AND SANDSTONE |

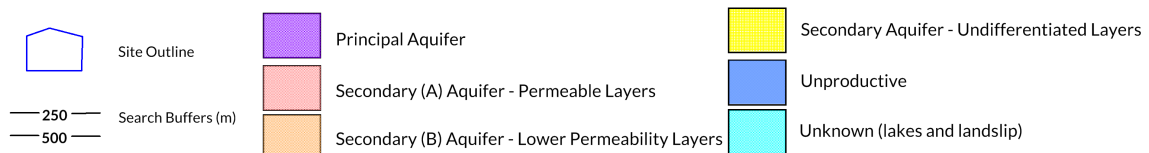
(Derived from the BGS 1:50,000 Digital Geological Map of Great Britain)

6 Hydrogeology and Hydrology

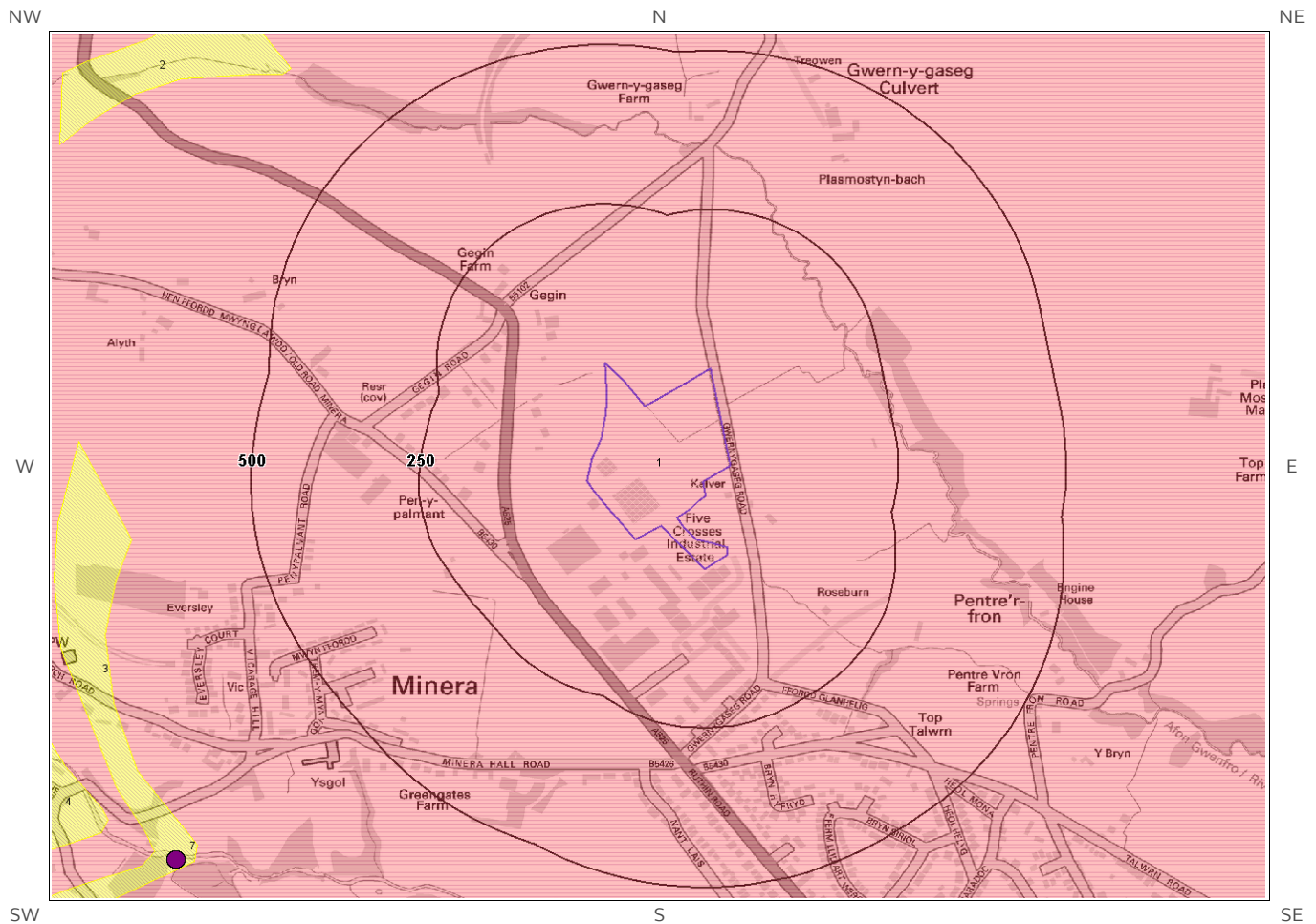
6a. Aquifer Within Superficial Geology



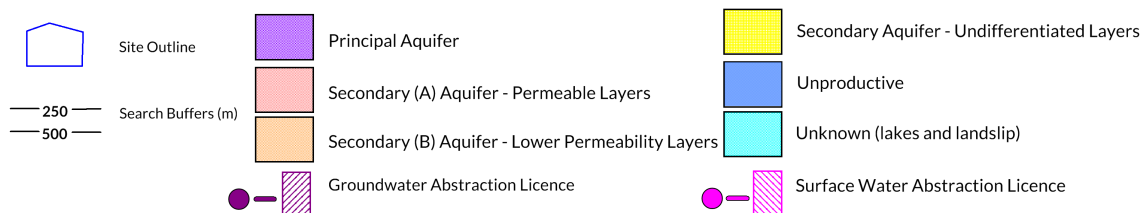
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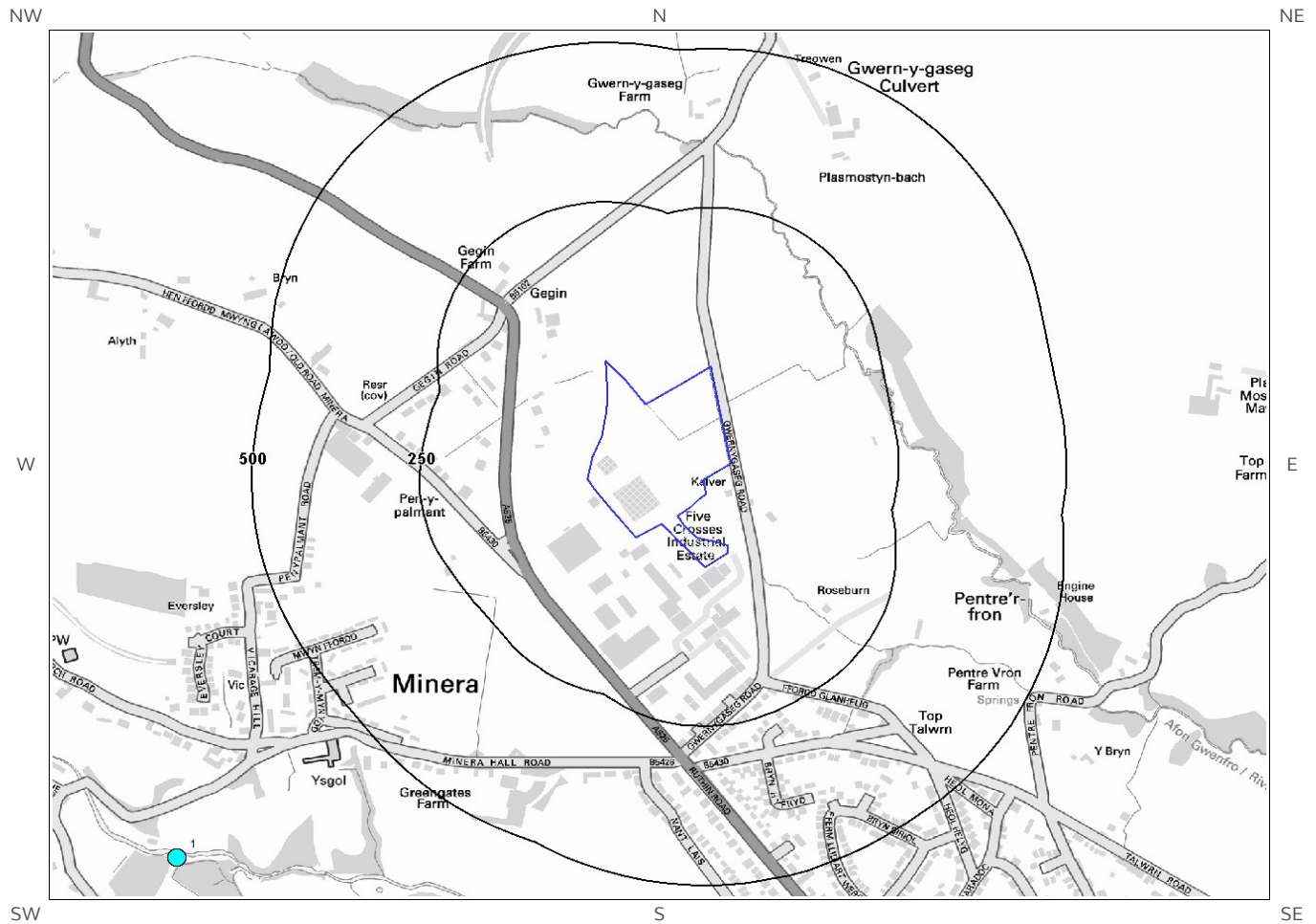
6b. Aquifer Within Bedrock Geology and Abstraction Licenses



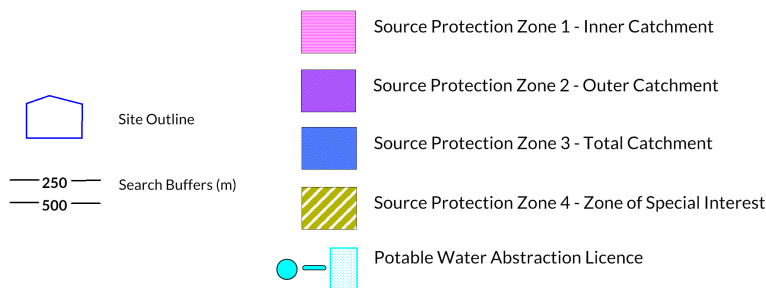
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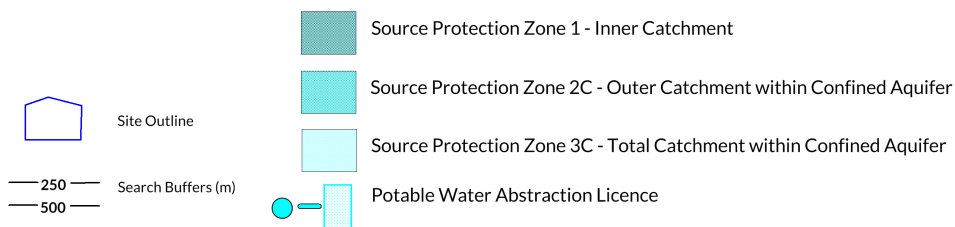
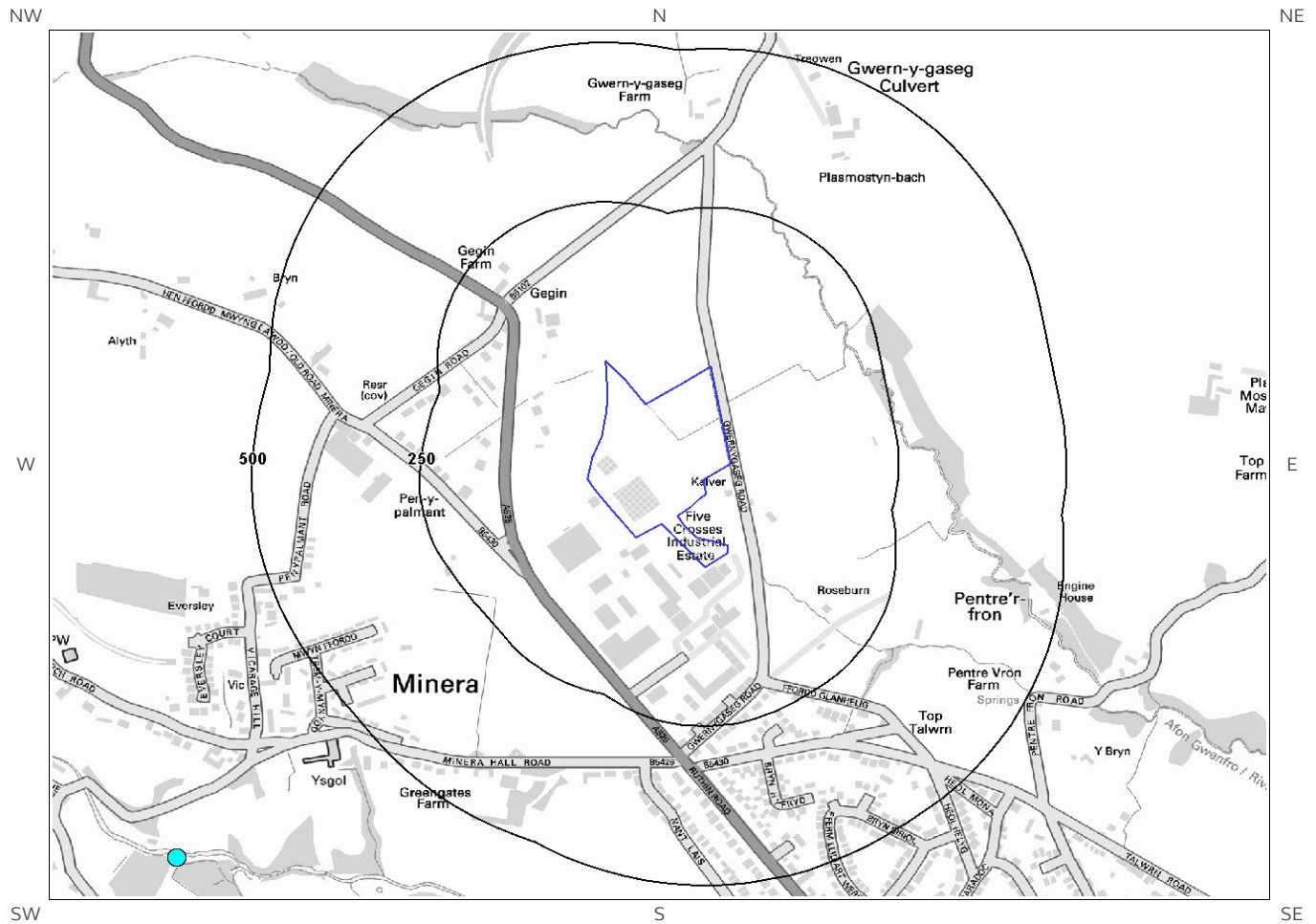
6c. Hydrogeology – Source Protection Zones and Potable Water Abstraction Licenses



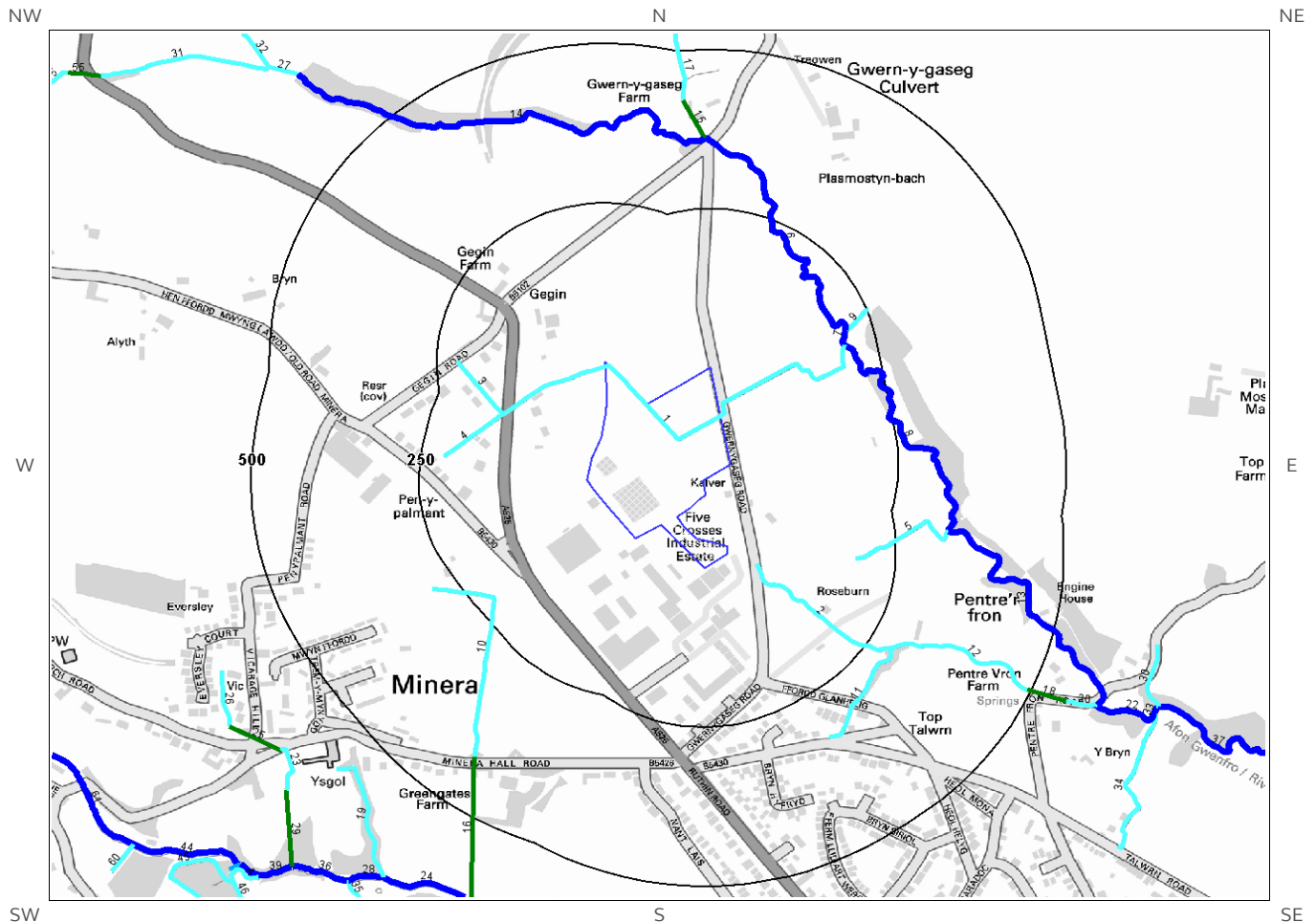
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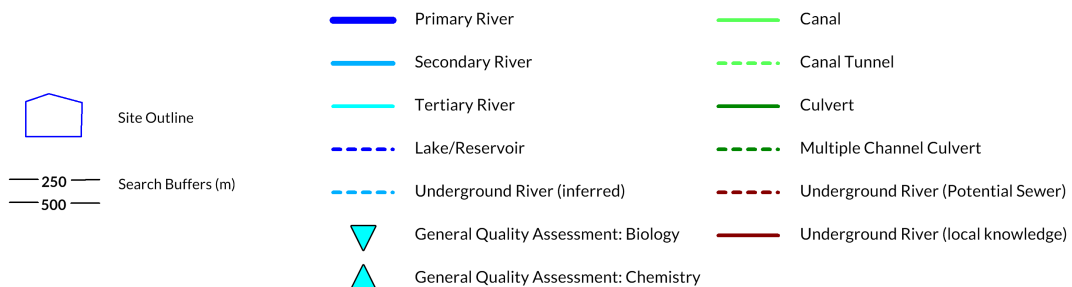
6d. Hydrogeology – Source Protection Zones within confined aquifer



6e. Hydrology – Detailed River Network and River Quality



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6. Hydrogeology and Hydrology

6.1 Aquifer within Superficial Deposits

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

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

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

| ID | Distance (m) | Direction | Designation | Description |
|----|--------------|-----------|--------------|--|
| 6 | 0 | On Site | Unproductive | These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow |
| 7 | 248 | NW | Unproductive | These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow |
| 1 | 409 | NW | Secondary A | Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers |

6.2 Aquifer within Bedrock Deposits

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

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

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

| ID | Distance (m) | Direction | Designation | Description |
|----|--------------|-----------|-------------|--|
| 1 | 0 | On Site | Secondary A | Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers |

6.3 Groundwater Abstraction Licences

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

Yes

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

| ID | Distance (m) | Direction | NGR | Details |
|-----------|--------------|-----------|------------------|---|
| 7 | 848 | SW | 327050 351641 | Status: Historical Licence No: 24/67/7/0035 Details: Potable Water Supply - Direct Direct Source: Eaw Groundwater Point: Park Day Level Data Type: Point Name: Dee Valley Water Plc Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: 4/9(h) Original Start Date: 5/7/1966 Expiry Date: - Issue No: 100 Version Start Date: 5/7/1966 Version End Date: |
| Not shown | 1173 | SW | 326890 351330 | Status: Historical Licence No: 24/67/7/0035 Details: Potable Water Supply - Direct Direct Source: Eaw Groundwater Point: Speedwell Shaft Data Type: Point Name: Dee Valley Water Plc Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: 4/9(h) Original Start Date: 5/7/1966 Expiry Date: - Issue No: 100 Version Start Date: 5/7/1966 Version End Date: |

6.4 Surface Water Abstraction Licences

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

No

Database searched and no data found.

6.5 Potable Water Abstraction Licences

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

Yes

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

| ID | Distance (m) | Direction | NGR | Details |
|----|--------------|-----------|------------------|---|
| 1 | 848 | SW | 327050 351641 | Status: Historical Licence No: 24/67/7/0035 Details: Potable Water Supply - Direct Direct Source: Eaw Groundwater Point: Park Day Level Data Type: Point Name: Dee Valley Water Plc Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: 4/9(h) Original Start Date: 5/7/1966 Expiry Date: - Issue No: 100 Version Start Date: Version End Date: |

| ID | Distance (m) | Direction | NGR | Details |
|-----------|--------------|-----------|------------------|--|
| Not shown | 1173 | SW | 326890 351330 | Status: Historical Licence No: 24/67/7/0035 Details: Potable Water Supply - Direct Direct Source: Eaw Groundwater Point: Speedwell Shaft Data Type: Point Name: Dee Valley Water Plc Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: 4/9(h) Original Start Date: 5/7/1966 Expiry Date: - Issue No: 100 Version Start Date: Version End Date: |

6.6 Source Protection Zones

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

No

Database searched and no data found.

6.7 Source Protection Zones within Confined Aquifer

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

No

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

Database searched and no data found.

6.8 Groundwater Vulnerability and Soil Leaching Potential

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

| Distance (m) | Direction | Classification | Soil Vulnerability Category | Description |
|--------------|-----------|---------------------------------------|-----------------------------|---|
| 0 | On Site | Minor Aquifer/Low Leaching Potential | L | Soils in which pollutants are unlikely to penetrate the soil layer because either water movement is largely horizontal, or they have the ability to attenuate diffuse pollutants. |
| 164 | W | Minor Aquifer/High Leaching Potential | HU | Soil information for urban areas and restored mineral workings. These soils are therefore assumed to be highly permeable in the absence of site-specific information. |
| 249 | SE | Minor Aquifer/High Leaching Potential | HU | Soil information for urban areas and restored mineral workings. These soils are therefore assumed to be highly permeable in the absence of site-specific information. |

6.9 River Quality

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

6.9.1 Biological Quality:

Database searched and no data found.

6.9.2 Chemical Quality:

Database searched and no data found.

6.10 Detailed River Network

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

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

| ID | Distance (m) | Direction | Details |
|----|--------------|-----------|--|
| 1 | 0 | On Site | <div> <div>River Name: Drain Welsh River Name: - Alternative Name: -</div> <div>River Type: Tertiary River Main River Status: Currently Undefined</div> </div> |

| ID | Distance (m) | Direction | Details | |
|----|--------------|-----------|--|--|
| 2 | 46 | E | River Name: Drain Welsh River Name: - Alternative Name: - | River Type: Tertiary River Main River Status: Currently Undefined |
| 3 | 148 | W | River Name: Drain Welsh River Name: - Alternative Name: - | River Type: Tertiary River Main River Status: Currently Undefined |
| 4 | 148 | W | River Name: - Welsh River Name: - Alternative Name: - | River Type: Tertiary River Main River Status: Currently Undefined |
| 5 | 190 | E | River Name: Drain Welsh River Name: - Alternative Name: - | River Type: Tertiary River Main River Status: Currently Undefined |
| 6 | 192 | NE | River Name: River Gwenfro Welsh River Name: Afon Gwenfro Alternative Name: - | River Type: Primary River Main River Status: Currently Undefined |
| 7 | 201 | E | River Name: River Gwenfro Welsh River Name: Afon Gwenfro Alternative Name: - | River Type: Primary River Main River Status: Currently Undefined |
| 8 | 202 | E | River Name: River Gwenfro Welsh River Name: Afon Gwenfro Alternative Name: - | River Type: Primary River Main River Status: Currently Undefined |
| 9 | 209 | E | River Name: - Welsh River Name: - Alternative Name: - | River Type: Tertiary River Main River Status: Currently Undefined |
| 10 | 221 | SW | River Name: - Welsh River Name: - Alternative Name: - | River Type: Tertiary River Main River Status: Currently Undefined |
| 11 | 283 | SE | River Name: - Welsh River Name: - Alternative Name: - | River Type: Tertiary River Main River Status: Currently Undefined |
| 12 | 285 | SE | River Name: - Welsh River Name: - Alternative Name: - | River Type: Tertiary River Main River Status: Currently Undefined |
| 13 | 330 | E | River Name: River Gwenfro Welsh River Name: Afon Gwenfro Alternative Name: - | River Type: Primary River Main River Status: Currently Undefined |
| 14 | 354 | N | River Name: River Gwenfro Welsh River Name: Afon Gwenfro Alternative Name: - | River Type: Primary River Main River Status: Currently Undefined |
| 15 | 361 | N | River Name: - Welsh River Name: - Alternative Name: - | River Type: Culvert Main River Status: Currently Undefined |
| 16 | 418 | SW | River Name: - Welsh River Name: - Alternative Name: - | River Type: Culvert Main River Status: Currently Undefined |
| 17 | 422 | N | River Name: Drain Welsh River Name: - Alternative Name: - | River Type: Tertiary River Main River Status: Currently Undefined |
| 18 | 494 | SE | River Name: - Welsh River Name: - Alternative Name: - | River Type: Culvert Main River Status: Currently Undefined |

6.11 Surface Water Features

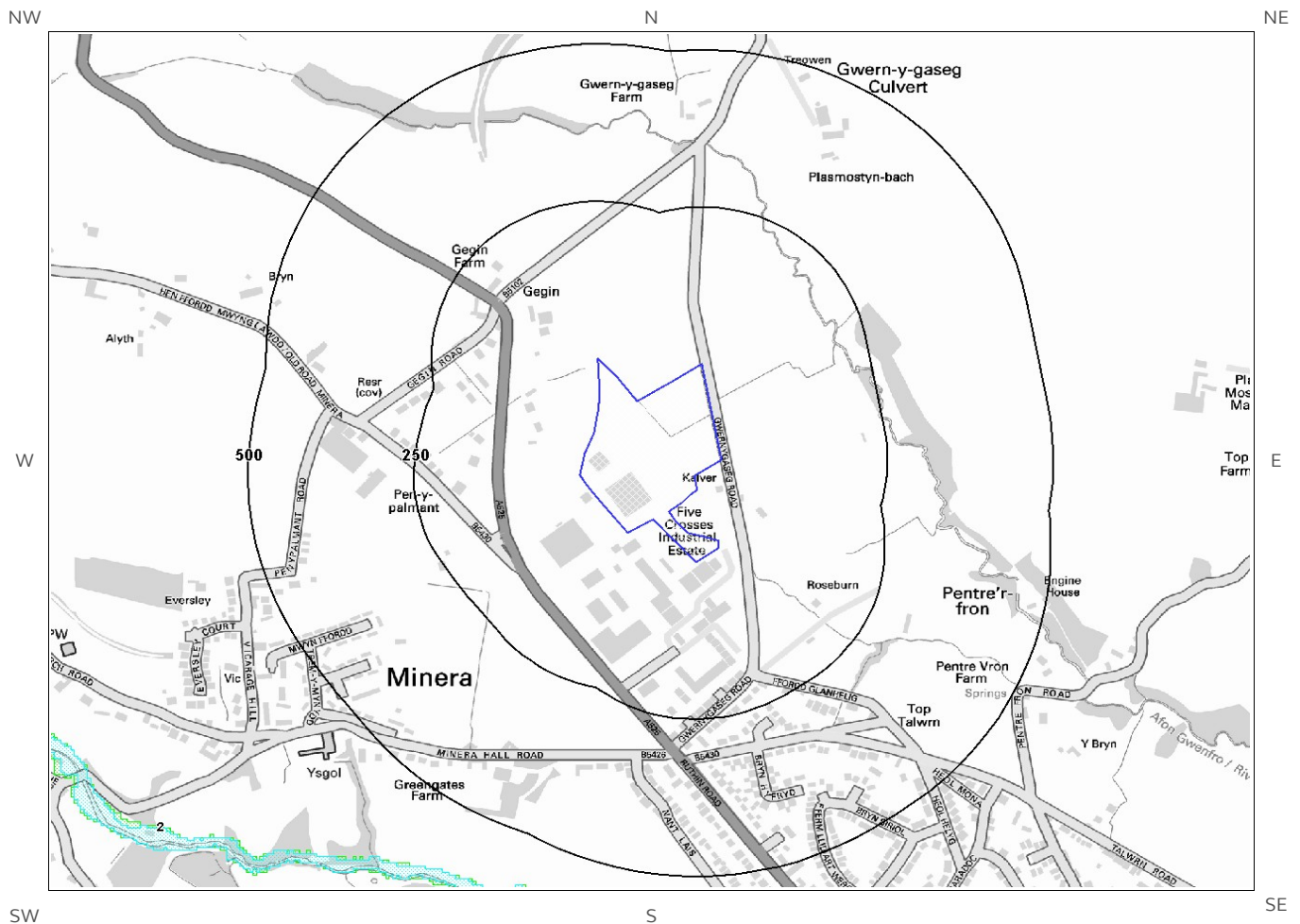
Are there any surface water features within 250m of the study site?

Yes

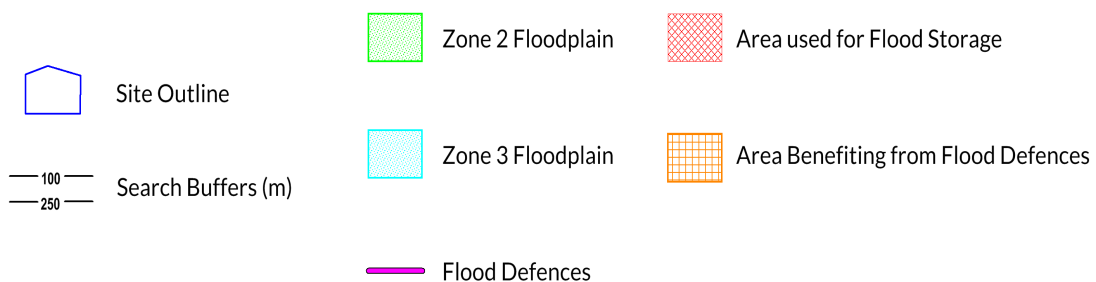
The following surface water records are not represented on mapping:

| Distance (m) | Direction |
|--------------|-----------|
| 0 | On Site |
| 7 | E |
| 21 | W |
| 46 | E |
| 119 | W |
| 152 | W |
| 162 | W |
| 190 | E |
| 191 | NE |
| 195 | SE |
| 211 | E |
| 223 | SW |
| 228 | SW |

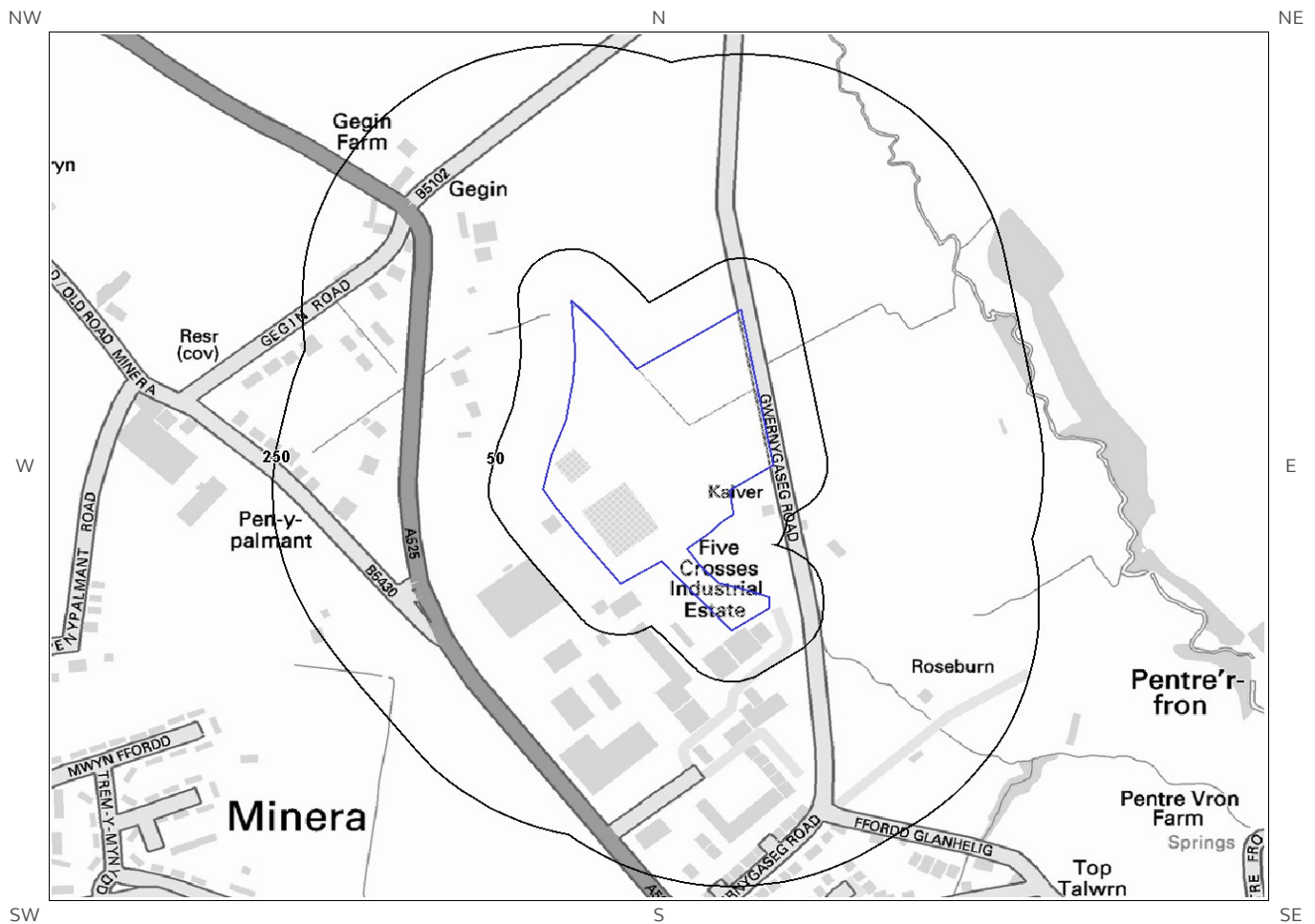
7a. Environment Agency Flood Map for Planning (from rivers and the sea)



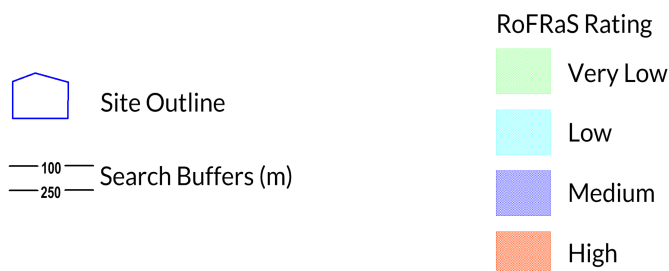
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7b. Environment Agency Risk of Flooding from Rivers and the Sea (RoFRaS) Map



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7 Flooding

7.1 River and Coastal Zone 2 Flooding

Is the site within 250m of an Environment Agency Zone 2 floodplain? No

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

Database searched and no data found.

7.2 River and Coastal Zone 3 Flooding

Is the site within 250m of an Environment Agency Zone 3 floodplain? No

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

Database searched and no data found.

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

What is the highest risk of flooding onsite? Very Low

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

RoFRaS data for the study site indicates the property is in an area with a Very Low (less than 1 in 1000) chance of flooding in any given year.

7.4 Flood Defences

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

7.5 Areas benefiting from Flood Defences

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

7.6 Areas benefiting from Flood Storage

Are there any areas used for Flood Storage within 250m of the study site?

No

7.7 Groundwater Flooding Susceptibility Areas

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

Does this relate to Clearwater Flooding or Superficial Deposits Flooding?

Clearwater Flooding

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

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

Limited potential

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

7.8 Groundwater Flooding Confidence Areas

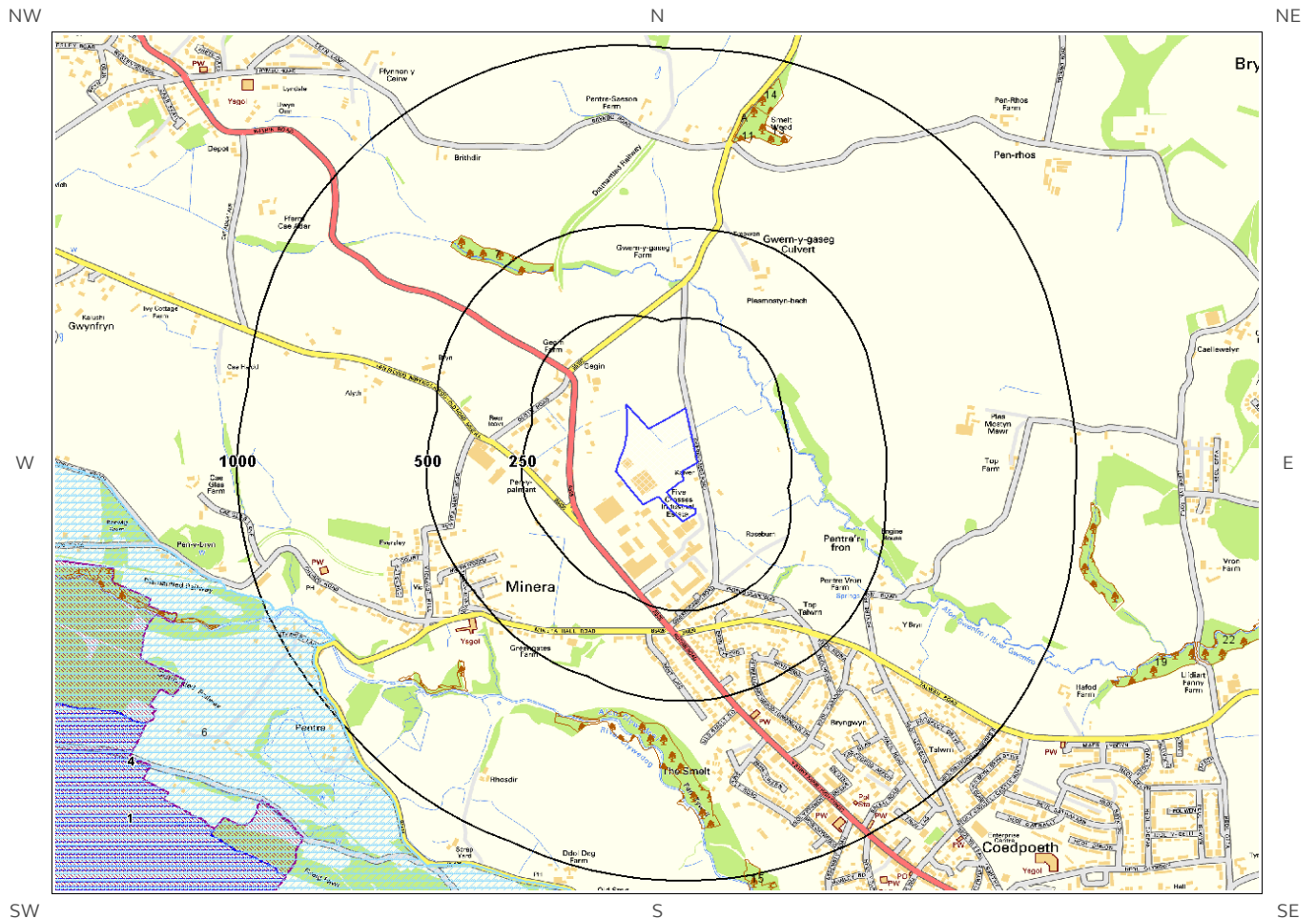
What is the British Geological Survey confidence rating in this result?

High

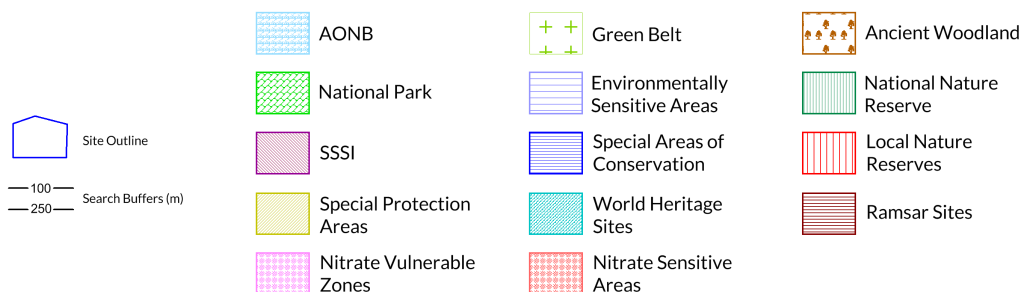
Notes: Groundwater flooding is defined as the emergence of groundwater at the ground surface or the rising of groundwater into man-made ground under conditions where the normal range of groundwater levels is exceeded.

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

8. Designated Environmentally Sensitive Sites Map



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8. Designated Environmentally Sensitive Sites

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

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

2

The following Site of Special Scientific Interest (SSSI) records provided by Natural England/Natural Resources Wales are represented as polygons on the Designated Environmentally Sensitive Sites Map:

| ID | Distance (m) | Direction | SSSI Name | Data Source |
|-----------|--------------|-----------|---|-------------------------|
| 4 | 1225 | W | RUABON/LLANTYSILIO MOUNTAINS AND MINERA | Natural Resources Wales |
| Not shown | 1657 | W | RUABON/LLANTYSILIO MOUNTAINS AND MINERA | Natural Resources Wales |

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

0

Database searched and no data found.

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

3

The following Special Area of Conservation (SAC) records provided by Natural England/Natural Resources Wales are represented as polygons on the Designated Environmentally Sensitive Sites Map:

| ID | Distance (m) | Direction | SAC Name | Data Source |
|-----------|--------------|-----------|---|-------------------------|
| 1 | 1398 | SW | Berwyn a Mynyddoedd De Clwyd / Berwyn and South Clwyd Mountains | Natural Resources Wales |
| Not shown | 1657 | W | Berwyn a Mynyddoedd De Clwyd / Berwyn and South Clwyd Mountains | Natural Resources Wales |
| Not shown | 1668 | W | Berwyn a Mynyddoedd De Clwyd / Berwyn and South Clwyd Mountains | Natural Resources Wales |

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

0

Database searched and no data found.

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

0

Database searched and no data found.

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

48

The following records of Designated Ancient Woodland provided by Natural England/Natural Resources Wales are represented as polygons on the Designated Environmentally Sensitive Sites Map:

| ID | Distance (m) | Direction | Ancient Woodland Name | Data Source |
|-----------|--------------|-----------|-----------------------|-----------------------------------|
| 7 | 420 | NW | Unknown | Restored Ancient Woodland Site |
| 8 | 552 | S | Unknown | Ancient and Semi-Natural Woodland |
| 9 | 646 | SW | Unknown | Ancient and Semi-Natural Woodland |
| 10A | 750 | N | Unknown | Restored Ancient Woodland Site |
| 11 | 758 | N | Unknown | Ancient and Semi-Natural Woodland |
| 12A | 762 | N | Unknown | Restored Ancient Woodland Site |
| 13 | 783 | N | Unknown | Ancient and Semi-Natural Woodland |
| 14 | 843 | N | Unknown | Ancient and Semi-Natural Woodland |
| 15 | 956 | S | Unknown | Ancient and Semi-Natural Woodland |
| 16 | 1017 | E | Unknown | Ancient and Semi-Natural Woodland |
| Not shown | 1063 | S | Unknown | Restored Ancient Woodland Site |
| 18 | 1131 | W | Unknown | Ancient and Semi-Natural Woodland |
| 19 | 1189 | SE | Unknown | Ancient and Semi-Natural Woodland |
| Not shown | 1285 | N | Unknown | Ancient and Semi-Natural Woodland |
| Not shown | 1309 | S | Unknown | Ancient and Semi-Natural Woodland |
| 22 | 1370 | E | Unknown | Ancient and Semi-Natural Woodland |
| Not shown | 1433 | N | GLASCOED | Ancient and Semi-Natural Woodland |
| Not shown | 1433 | N | GLASCOED | Ancient and Semi-Natural Woodland |
| Not shown | 1462 | N | GLASCOED | Ancient and Semi-Natural Woodland |
| Not shown | 1487 | N | GLASCOED | Ancient and Semi-Natural Woodland |
| Not shown | 1526 | N | Unknown | Ancient Replanted Woodland |
| Not shown | 1538 | N | Unknown | Ancient Replanted Woodland |
| Not shown | 1540 | S | Unknown | Restored Ancient Woodland Site |
| Not shown | 1629 | N | GLASCOED | Ancient and Semi-Natural Woodland |
| Not shown | 1654 | N | Unknown | Ancient Replanted Woodland |
| Not shown | 1671 | N | Unknown | Ancient Replanted Woodland |
| Not shown | 1674 | N | GLASCOED | Ancient and Semi-Natural Woodland |

| ID | Distance (m) | Direction | Ancient Woodland Name | Data Source |
|-----------|--------------|-----------|-----------------------|-----------------------------------|
| Not shown | 1676 | N | Unknown | Ancient and Semi-Natural Woodland |
| Not shown | 1686 | E | Unknown | Ancient and Semi-Natural Woodland |
| Not shown | 1688 | N | Unknown | Ancient and Semi-Natural Woodland |
| Not shown | 1704 | N | GLASCOED | Ancient and Semi-Natural Woodland |
| Not shown | 1734 | N | Unknown | Ancient and Semi-Natural Woodland |
| Not shown | 1735 | N | Unknown | Ancient and Semi-Natural Woodland |
| Not shown | 1827 | N | GLASCOED | Ancient and Semi-Natural Woodland |
| Not shown | 1833 | S | Unknown | Restored Ancient Woodland Site |
| Not shown | 1834 | N | Unknown | Ancient and Semi-Natural Woodland |
| Not shown | 1881 | SE | Unknown | Restored Ancient Woodland Site |
| Not shown | 1897 | NE | Unknown | Other Ancient Woodland |
| Not shown | 1917 | NE | Unknown | Other Ancient Woodland |
| Not shown | 1925 | N | GLASCOED | Ancient and Semi-Natural Woodland |
| Not shown | 1934 | E | Unknown | Other Ancient Woodland |
| Not shown | 1957 | E | Unknown | Other Ancient Woodland |
| Not shown | 1960 | N | GLASCOED | Ancient and Semi-Natural Woodland |
| Not shown | 1967 | NW | Unknown | Restored Ancient Woodland Site |
| Not shown | 1972 | NW | Unknown | Restored Ancient Woodland Site |
| Not shown | 1976 | NW | Unknown | Ancient and Semi-Natural Woodland |
| Not shown | 1986 | N | GLASCOED | Ancient and Semi-Natural Woodland |
| Not shown | 1999 | NW | Unknown | Ancient Replanted Woodland |

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

0

Database searched and no data found.

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

0

Database searched and no data found.

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

0

Database searched and no data found.

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

1

The following Area of Outstanding Natural Beauty (AONB) records provided by Natural England/Natural Resources Wales are represented as polygons on the Designated Environmentally Sensitive Sites Map:

| ID | Distance (m) | Direction | AONB/NSA Name | Data Source |
|----|--------------|-----------|---|-------------------------|
| 6 | 878 | SW | BRYNIAU CLWYD A DYFFRYN DYFRDWY/CLWYDIAN RANGE AND DEE VALLEY | Natural Resources Wales |

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

0

Database searched and no data found.

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

0

Database searched and no data found.

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

0

Database searched and no data found.

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

0

Database searched and no data found.

9. Natural Hazards Findings

9.1 Detailed BGS GeoSure Data

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

9.1.1 Shrink Swell

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

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

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

9.1.2 Landslides

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

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

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

9.1.3 Soluble Rocks

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

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

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

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

9.1.4 Compressible Ground

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

Very Low

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

| Hazard |
|--|
| Very low potential for compressible deposits to be present. No special actions required to avoid problems due to compressible deposits. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with compressible deposits. |

9.1.5 Collapsible Rocks

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

Very Low

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

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

9.1.6 Running Sand

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

Very Low

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

| Hazard |
|--|
| Very low potential for running sand problems if water table rises or if sandy strata are exposed to water. No special actions required, to avoid problems due to running sand. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with running sand. |

9.2 Radon

9.2.1 Radon Affected Areas

Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level? The property is in a Radon Affected Area, as between 5 and 10% of properties are above the Action Level.

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

9.2.2 Radon Protection

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

ones as described in publication BR211 by the Building Research Establishment? Basic radon protective measures are necessary.

10. Mining

10.1 Coal Mining

Are there any coal mining areas within 75m of the study site?

Yes

The following coal mining information provided by the Coal Authority is not represented on Mapping:

| Distance (m) | Direction | Details |
|--------------|-----------|---|
| 0 | On Site | The study site is located within the specified search distance of an identified mining area. Further details concerning this can be obtained from the Coal Authority Helpline on 0845 762 6848. |

10.2 Non-Coal Mining

Are there any Non-Coal Mining areas within 50m of the study site boundary?

Yes

The following non-coal mining information is provided by the BGS:

| Distance (m) | Direction | Name | Commodity | Assessment of likelihood |
|--------------|-----------|---------------|-------------------|--|
| 0.0 | On Site | Not available | Iron Ore (Bedded) | Localised small scale underground mining may have occurred. Potential for difficult ground conditions are unlikely or localised and are at a level where they need not be considered |

Past underground mine workings may occur. The rock types present in these areas are such that small mineral veins may be present on which it is possible that small scale mining has been undertaken and/or it is possible that limited underground extraction of other materials may have occurred. All such occurrences are likely to be of minor localised extent and infrequent. It should be noted, however, that there is always the possibility of the existence of other sub-surface excavations, such as wells, cess pits, follies, air raid shelters/bunkers and other military structures etc. that could affect surface ground stability but which are outside the scope of this dataset. However, if in a coalfield area you should still consider a Coal Authority mining search for the area of interest.

10.3 Brine Affected Areas

Are there any brine affected areas within 75m of the study site?

No

Guidance: No Guidance Required.

Contact Details

Groundsure Helpline
Telephone: 08444 159 000
info@groundsure.com

British Geological Survey Enquiries

Kingsley Dunham Centre
Keyworth, Nottingham NG12 5GG
Tel: 0115 936 3143.
Fax: 0115 936 3276.
Email:

Web: www.bgs.ac.uk

BGS Geological Hazards Reports and general geological enquiries:
enquiries@bgs.ac.uk

Environment Agency

National Customer Contact Centre, PO Box 544
Rotherham, S60 1BY
Tel: 08708 506 506

Web: www.environment-agency.gov.uk

Email: enquiries@environment-agency.gov.uk

Public Health England

Public information access office
Public Health England, Wellington House
133-155 Waterloo Road, London, SE1 8UG
www.gov.uk/phe

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

The Coal Authority

200 Lichfield Lane
Mansfield
Notts NG18 4RG
Tel: 0345 7626 848
DX 716176 Mansfield 5
www.coal.gov.uk

Ordnance Survey

Adanac Drive, Southampton
SO16 0AS
Tel: 08456 050505

Local Authority

Authority: Wrexham - Wrexham County Borough Council
Phone: 01978 292 000

Web: <http://www.wrexham.gov.uk/>

Address: The Guildhall, Wrexham, Wrexham, LL11 1AY

Gemapping PLC

Virginia Villas, High Street, Hartley Witney,
Hampshire RG27 8NW
Tel: 01252 845444



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

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