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WREXHAM INDUSTRIAL ESTATE

PHASE 1 PRELIMINARY RISK ASSESSMENT

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Client Name: Elite Onyx Properties (UK) SARL

Client Address: 51 Boulevard Grande-Duchesse Charlotte, L-1331, Luxembourg, Grand Duchy of Luxembourg

Site Address: Industrial Unit off Bryn Lane, Wrexham Industrial Estate , Wrexham, LL13 9UT

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EXECUTIVE SUMMARY

Appointment	Curtins were instructed by Elite Onyx Properties (UK) SARL to undertake a Phase 1 Preliminary Risk Assessment (PRA) of land off Bryn Lane, Wrexham Industrial Estate, Wrexham, LL13 9UT. The site is centred on 339440, 350115 and covers an area of approximately 2.1 Ha. It is understood that proposals comprise the construction of a new industrial warehouse with associated infrastructure and civil engineering works. The report is prepared in support of an outline planning application for the proposed redevelopment of the site.
Current Site Status	The northwest of the site is occupied by a concrete slab, currently used for storage. Below ground infrastructure (e.g drains, foundations etc.) appear to remain in place. The slab is situated at a lower level (c. 26.6m AOD) than land directly south (hardstanding and scrubland) and west (existing warehouse) of it (c. 30m AOD), a large retaining structure maintains the levels at these perimeters. The southwestern portion of the site is characterised by scrubland, with small areas of hardstanding currently used for storage. An access road is present, orientated north to south through the centre of the site. The eastern portion is heavily vegetated, including mature trees and scrubland. Residual structures associated with historic tanks are situated in the south east of the site. A drainage ditch is present in the east of the site, orientated north to south. Notwithstanding the vertical level change at the retaining wall the site slopes gently from south to north.
Site History	Earliest mapping (1870s) shows the site as undeveloped agricultural land, with small ponds located to the north, west and south of the site. By 1972, a fiberglass factory was constructed on site, and immediately west of the site. The factory included: • A large main factory building in the northwest, extending off-site to the west. • An access road, from the south of the site to the north. • External hardstanding areas. • Tanks and substations in the northwest of the sites • Tanks in the north of the site • 5 No. above ground circular tanks in the southeast of the site. A small square building was recorded directly north of the tank area. • A small building was recorded in the south of the site, west of the access road. • A drainage ditch orientated north to south, flowing to the north, in the east of the site. In addition to construction of the fibreglass factory to the west of the site, a Water Control Station, Gas Control Stations, tanks two electrical substations were constructed south of the main access road, at the southern part of the wider ownership boundary. Further industrial buildings were constructed north of the site, as well as other above ground tanks. 4 No. large warehouses were constructed 200m – 550m south and southwest of the site. By 2005, the fibreglass factory, including associated infrastructure was demolished / redeveloped. The site was left vacant in its current layout and is currently used for storage.
Geology and Hydrogeology	BGS mapping indicates the site is underlain by Till deposits (Secondary Undifferentiated Aquifer), anticipated to comprise clay soils based on review of BGS records. Underlying bedrock deposits are recorded as the Kinnerton Sandstone Formation (Principal Aquifer). The site is not located within a Source Protection Zone (SPZ). The closest potable groundwater abstraction is located 934m north-east of the site for general farming and domestic purposes.
Hydrology	A drainage ditch is recorded in the east of the site, orientated north to south, which flows to the north. This, and other drains, flow towards the River Dee, approximately 2.5km from the site. Several ponds are located directly north and east of the site, and a large pond is located south of the sub-station, south of the site. Several ponds are also recorded in the wider setting to the north, east south and west. There are no active surface water abstractions within 1km of the site. One pollution incident to controlled waters has been reported within 500m of the site. This was a Category 3 – Minor Incident, comprising a petrol spillage at a waste handling facility in 1994. The nearest discharge consent is located approximately 235m east of the site, where domestic discharge (unspecified) is discharged into an unnamed freshwater stream or river.
Landfill and Pollution	The nearest recorded registered landfill site is located approximately 875m southwest of the study area. The Envirocheck Report states that the site is closed and accepted between 10,000T and 25000T of special waste per year. There is one historic landfill site recorded within 1km of the site, located approximately 300m south of the site where Inert waste and liquid sludge was reported to be deposited between January 1968 and December 1977. The nearest licence waste management facility is a metal recycling site located approximately 320m west of the site. A household waste recycling centre is located approximately 465m west of the site.

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	There are no recorded instances of infilled land within the study area, the nearest is a former pond approximately 85m to the east.
Unexploded Ordnance (UXO)	UXO Risk Mapping records indicate the site is located in a low risk area (regions that show a bomb density of 10 bombs per 1000 acres or fewer). During WWII, the site appeared to be used for agricultural farming, with no specific Luftwaffe targets on site. Mapping records do not indicate any ruins, or buildings that were no longer recorded in post-WWII mapping records, on or surrounding the site Based on the forgoing commentary, the likelihood of encountering UXO on site as part of any Curtins intrusive ground investigation works is **Low**.
Initial Ground Contamination Assessment	The risk from contamination sourced within Made Ground soils to the site end-users and construction workers considered to be **Moderate/Low** and **Moderate**, respectively. The risk posed to Controlled Waters (groundwater and surface water) is considered to be **Low**. The risk posed to site end-users from ground gases is considered to be **Moderate/Low.**
Ground Engineering Considerations	Ground stability hazards including collapsible ground, compressible ground, ground dissolution, landslides, running sands and shrinking or swelling clay are largely recorded as Very Low to No Hazard. Residual obstructions may be present in the ground associated with the historic fiberglass factory building and associated structures and tanks. Tank sub-structures remain in place in the southeast of the site. Further information on historic tanks contents and decommissioning status should be sought.
Recommendations	The following recommendations are made: • Undertake an intrusive ground investigation to collect chemical and geotechnical samples to inform revised conceptual site model and geotechnical assessment. • Undertake an intrusive ground investigation to include the installation of ground gas and groundwater monitoring wells. • Undertake a GQRA as part of the ground investigation to refine the Conceptual Site Model and further assess contaminated land risks. • Undertake ground gas monitoring as part of the ground investigation. • Where visual or olfactory evidence of ground or groundwater contamination is identified, undertake groundwater chemical analysis to assess risks to surface water features (e.g. drainage ditch, nearby ponds). It is further recommended that this work is completed in advance of any development works taking place.

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1 INTRODUCTION

1.1 Project Background

Curtins were instructed by Colliers, on behalf of Elite Onyx Properties (UK) SARL, to undertake a Phase 1 Preliminary Risk Assessment (PRA) of land off Bryn Lane, Wrexham Industrial Estate, Wrexham, LL13 9UT.

It is understood that proposals comprise the construction of a new industrial warehouse with associated infrastructure and civil engineering works. The report is prepared in support of an outline planning application for the proposed redevelopment of the site.

A site location plan is presented in Figure 1. The study area considered in this report is illustrated in red, whilst the wider land ownership boundary is shown in pink. Figure 2 illustrates the proposed development location, within the ownership boundary, adjacent to the existing warehouse.

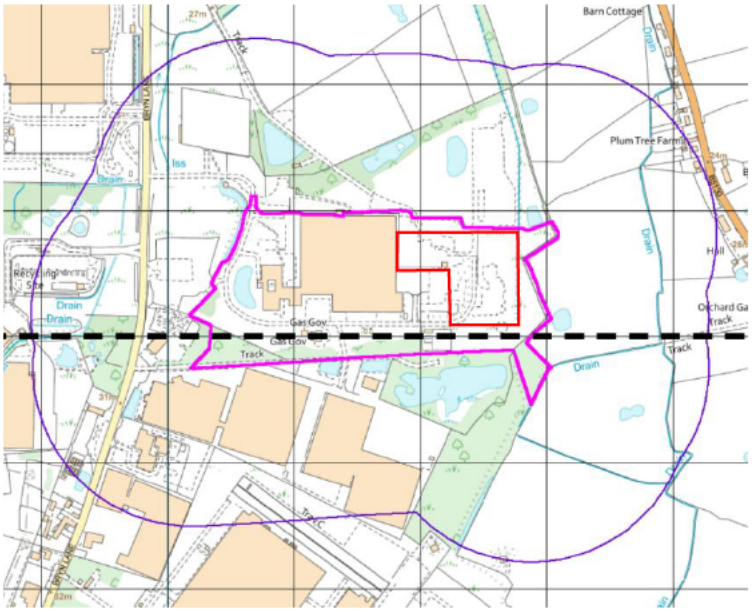


Figure 1 – Ownership Boundary Location Plan, site boundary shown in pink

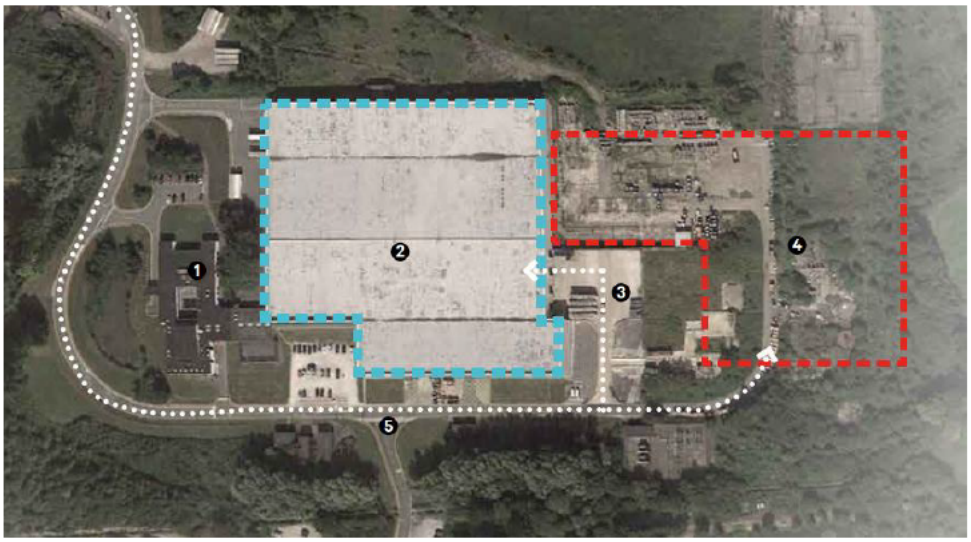


Figure 2 – Development Area, shown in red. Development Plan from Wrexham Industrial Estate, Wrexham Feasibility Report (23020 Ref. 1)

A proposed development plan is included in *Appendix A*.

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1.2 Scope of Services

The Phase 1 PRA is intended to provide an overview of the geo-environmental and geo-technical setting of the site. These works are undertaken in general accordance with the LCRM: Stage 1 risk assessment (Ref. 2).

Through this overview the Phase 1 aims to develop both a working conceptual and ground model for the site, as well as present an initial assessment of any risks that could be presented to the development including its intended end users and the wider environment.

Specifically, the Phase 1 provides an initial assessment of the site regarding:

a) Potential contamination of the site strata by historical and or current use;
b) The potential impact on the wider environment by historical and or current use of the site of interest;
c) The potential impact from surrounding land uses and other environmental factors;
d) Potential problems associated with geological features such as faulting, mineral extraction, mining, and land instability;
e) The location of apparent sub-surface structures that may affect the proposed redevelopment; and
f) The location of above-surface features that may affect the proposed redevelopment.

The Phase 1 PRA is a desk-based exercise written using information provided from a desk based environmental study and other information made available to Curtins from the Client. The PRA can be utilised to inform the requirement for, and extent of, any future investigation work.

Consideration of detailed flood risk, ecology and archaeological issues are outside of the scope of this report.

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2 CURRENT SITE AND SURROUNDING AREA DETAILS

2.1 Site Location and Current Details

Pertinent details for the site have been obtained from satellite imagery and are detailed in Table 1.

Table 1 – Site Details

Site Address	Land off Bryn Lane, Wrexham Industrial Estate, Wrexham, LL13 9UT
NGR	339440, 350115
Area of Site	Development Area – Approximately 2.1 Ha
Current Site Use and Description	The northwest of the site is occupied by a concrete slab, currently used for storage. Below ground infrastructure (e.g drains, foundations etc.) appear to remain in place. The slab is situated at a lower level (c. 26.6m AOD) than land directly south (hardstanding and scrubland) and west (existing warehouse) of it (c. 30m AOD), a large retaining structure maintains the levels at these perimeters. The southwestern portion of the site is characterised by scrubland, with small areas of hardstanding currently used for storage. An access road is present, orientated north to south through the centre of the site. The eastern portion is heavily vegetated, including mature trees and scrubland. Residual structures associated with historic tanks are situated in the south east of the site. A drainage ditch is present in the east of the site, orientated north to south. Notwithstanding the vertical level change at the retaining wall, the site slopes gently from south to north.

The wider ownership boundary comprises the main access road, off Bryn Lane, a warehouse with associated HGV access and turning areas, car parking facilities and soft landscaping. Two substations are located south of the main access road, including one south of the main study area, and one west of the junction to a larger distribution centre south of the ownership area. A Water Control Station and Gas Control Station are also located in the south of the ownership boundary.

2.2 Surrounding Area Details

The information detailed in Table 2 was established through undertaking an environmental database search (Envirocheck report (Ref. 3) included in *Appendix B*).

Table 2 – Surrounding Land Use (Adjacent to the study area)

Direction	Land Use / Description
North	Gass/scrubland, with access tracks. A concrete slab is situated north of the site, east of the access road.
East	Farmland
South	Substation and soft landscaping/woodland with trees. A large pond and distribution centre are situated further south.
West	Existing warehouse and distribution centre, including HGV access and turning area, and car parking further west.

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3 SITE HISTORY

A review of the available historical mapping and other information for the site, as presented within the Envirocheck report (Ref. 3), has been undertaken and is presented in Table 3. Bold text indicates within the site boundary.

Table 3 – Previous Site and Surrounding Area Uses and Potential Sources of Contamination (Study Area)

Date	Description	Potential Sources of Contamination
1872 - 1972	**Earliest mapping (1872) shows the development area as undeveloped agricultural land. A footpath was recorded in the north of the site.** The surrounding area generally comprised of agricultural fields. A pond was recorded directly north of the site, with further ponds to the west and south. A pond was recorded approximately 70m east of the site by 1961.	• **Limited sources of potential contamination on-site.** • Limited sources of potential contamination off-site.

1972 – 2005	**By 1972, a fibreglass factory was constructed on site, including:**
	
	• **A large main factory building in the northwest, extending off-site to the west.**
	• **An access road, from the south of the site to the north.**
	• **External hardstanding areas.**
	• **Tanks and substations in the northwest of the sites**
	• **Tanks in the north of the site**
	• **5 No. above ground circular tanks in the southeast of the site. A small square building was recorded directly north of the tank area.**
	• **A small building was recorded in the south of the site, west of the access road.**
	• **A drainage ditch orientated north to south, flowing to the north, in the east of the site.**
	
	In addition to construction of the fibreglass factory to the west of the site, a Water Control Station, Gas Control Stations, tanks two electrical substations were constructed south of the main access road, at the southern part of the wider ownership boundary.
	
	Further industrial buildings were constructed north of the site, as well as other above ground tanks.
	
	4 No. large warehouses were constructed 200m – 550m south and southwest of the site.
		• **Potential for uncontrolled deposition during the construction of the Fibreglass works on site.**
		• **Asbestos materials may be present in soils accounting for the period in which the factory was constructed.**
		• **Potential contaminants associated with the fibreglass manufacturing works/processing and associated infrastructure (See Section 7.1) including:**
		  ○ **Spillages/leakages from storage tanks**
		  ○ **Manufacturing/processing works**
		  ○ **Leakage/spillage of fuel oils from HGVs and other factory traffic.**
		  ○ **PCB leakages/spillages from sub-stations**
		
		• Mobile contaminants sourced from fibreglass manufacturing and processing works, and associated infrastructure.
		• Potential for uncontrolled deposition of Made Ground during the infilling of off-site ponds.

2005 – 2025	**By 2005, the fibreglass factory, including associated infrastructure was demolished / redeveloped. The site was left vacant in its current layout and is currently used for storage.** The fibreglass factory, including associated infrastructure was demolished / redeveloped. A warehouse was constructed directly west of the site, in its current layout and setting, occupying the footprint of the former factory.	• **Potential for uncontrolled deposition of Made Ground during the demolition of the fibreglass works and associated buildings.** • Potential for uncontrolled deposition of Made Ground during the demolition of the fibreglass works and associated buildings.

Potential sources of on-site contamination are further discussed in *Section 6.0*.

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4 GEOLOGY, HYDROGEOLOGY AND HYDROLOGY

4.1 Geology and Hydrogeology

A study of the Envirocheck records (Ref. 3), British Geological Survey (BGS) 1:50,000 mapping records (Solid and Drift Editions) for Wrexham (Sheet 121) (Ref. 4) and BGS GeoIndex (Ref. 5) indicates the following geological and hydrogeological succession underlying the site, summarised in Table 4:

Table 4 – Geological / Hydrogeological Succession

Geology	Associated Hydrogeological Classification
BGS Records do not indicate the presence of Made Ground on site, however given the historic land use and current setting of the site, it is likely that Made Ground soils will be present.	N/A
Devensian Till[1]	Secondary Undifferentiated Aquifer[2]
Kinnerton Sandstone Formation[3]	Principal Aquifer[4]

Notes:

1. *Till is unsorted and unstratified drift. It consists of a heterogenous mixture of clay, sand, gravel, and boulders varying widely in size and shape.*
2. *Aquifers that do not fit into either Secondary A or Secondary categories. The heterogeneous nature of the rock, which can vary significantly in permeability and water storage capacity. Able to support local water supplies but are not considered significant sources for strategic water supply.*
3. *Red-brown to yellow sandstone. Generally pebble-free, fine- to medium-grained and cross-stratified.*
4. *A principal aquifer is a geologically significant layer of rock or sediment that stores and transmits large quantities of groundwater, often used for drinking water and supporting rivers and wetlands.*

There are four BGS boreholes located within the site boundary and two BGS boreholes immediately north of the site boundary, shown in Figure 4 below. The BGS borehole records are presented in Table 5:

Table 5 – BGS Borehole Records

Record Number	Location (Easting, Northing)	Details (Depth to base m bgl, Description and Thickness)
SJ35SE45	339510, 350050 On Site (Southeast)	**Ground Level 28.50m** 0.00m Made Ground (0.15m) 0.15m Very stiff brown grey silty clay (1.70m) 1.85m Very stiff brown silty boulder clay, with occasional traces of grey and a few moist pockets (13.15m) **Borehole completed at 15.0m bgl.**
SJ35SE46	339450, 350210 c. 20m north of the study area	**Ground Level 28.70m** 0.00m Made Ground (0.15m) 0.15m Very stiff brown silty boulder clay, with occasional traces of grey and a few moist pockets (14.75m) **Borehole completed at 15.0m bgl.**
SJ35SE44	339350, 350050 c. 70m west of the study area	**Ground Level 30.50m** 0.00m Very stiff sandy mottled clay (2.00m) 2.00m Vey stiff brown grey silty clay (5.00m) 7.00m Stiff brown grey boulder clay (8.00m) **Borehole completed at 15.0m bgl.**

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Record Number	Location (Easting, Northing)	Details (Depth to base m bgl, Description and Thickness)
SJ35SE43	339250, 350050 c. 160m west of the study area	**Ground Level 31.50m** 0.00m Very stiff sandy mottled clay (0.50m) 0.50m Vey stiff brown grey silty clay (6.50m) 6.50m Stiff brown silty boulder clay, with occasional traces of grey and a few moist pockets (8.50m) **Borehole completed at 15.0m bgl.**
SJ35SE47	339240, 350210 c. 120m west of the study area	**Ground Level 31.30m** 0.00m Made Ground (0.15m) 0.15m Very stiff brown grey silty clay (1.70m) 1.85m Very stiff brown silty boulder clay, with occasional traces of grey and a few moist pockets (13.15m) **Borehole completed at 15.0m bgl.**
SJ35SE42	339120, 350050 (c. 250m West of the study area)	**Ground Level 32.20m** 0.00m Very stiff sandy mottled clay (1.75m) 1.75m Stiff brown grey boulder clay (10.50m) 12.25m Firm stiff grey laminated silty clay with slight sand traces (2.75m) **Borehole completed at 15.0m bgl.**
SJ34NE34/31	339550, 349850 (c. 160m south of the study area)	**Ground Level 94.45ft (28.79m AOD)** 0.00m Stiff brown boulder clay with occasional pebbles (30.48m) **Borehole completed at 100ft (30.48m) bgl.**

There are no BGS recorded geological fault lines located within 1km of the site.

The underlying Glacial Till is recorded as a Secondary Undifferentiated Aquifer, and the underlying Kinnerton Sandstone Formation is classified as a Principal Aquifer. The site is not recorded to be within groundwater source protection zone (SPZ).

There are no groundwater abstraction points within 500m of the site boundary. The nearest is reported to be a well located 948m northeast of the site for General Farming and Domestic use.

4.1.1 Mining

The Envirocheck Report (Ref. 3) and The Mining Remediation Authority's online interactive mapping (Ref. 6) confirms that the site is not situated within a coal mining reporting area. However, the site is in close proximity to the North Wales Coal Mining Reporting area.

There are no BGS recorded mineral site was located 1km of the site boundary.

Based on the forgoing commentary the likelihood of encountering relic mining features on-site is unlikely and, therefore, has not been considered further.

4.1.2 Other Ground Stability Issues

The Envirocheck Report confirms the following in relation to potential geotechnical hazards highlighted in Table 6 below:

Table 6 – Ground Stability Hazards for the Site and Surrounding Area.

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Ground Stability Hazard	Hazard Potential On-site	Hazard Potential Off-site
Collapsible Ground	**Very Low**	N/A
Compressible Ground	**No Hazard**	N/A
Ground Dissolution (Soluble Rocks)	**No Hazard**	N/A
Landslide	**Very Low**	N/A
Running Sand	**Very Low**	N/A
Shrinking or Swelling Clay	**Very Low**	N/A

Intrusive ground investigation works would confirm the nature of the ground conditions at the subject site.

4.1.3 Radon Ground Gas

The Envirocheck report (Ref. 3), BGS GeoIndex (Ref. 5) and UK Radon Mapping (Ref. 7) confirms the site is situated within a lower probability radon area (less than 1% of homes are estimated to be at or above the radon action level).

No radon protection measures are likely to be required.

If this document is being referred to by an employer/prospective employer utilising space in the proposed development as workplaces, they are reminded of their responsibilities in respect of radon in the workplace under the Health and Safety at Work Act 1974. This is a reminder of legal requirements an employer should be aware of and comply with. This is not related to and does not impact upon the Local Authority Planning requirements and the discharge of conditions advised by a planning application decision notice.

4.2 Hydrology

A drainage ditch is recorded in the east of the site, orientated north to south, which flows to the north. This, and other drains, flow towards the River Dee, approximately 2.5km from the site. Several ponds are located directly north and east of the site, and a large pond is located south of the sub-station, south of the site. Several ponds are also recorded in the wider setting to the north, east south and west.

One pollution incident to controlled waters has been reported within 500m of the site. This was a Category 3 – Minor Incident, comprising a petrol spillage at a waste handling facility in 1994.

There are no active surface water abstractions within 1km of the site.

The nearest discharge consent is located approximately 235m east of the site, where domestic discharge (unspecified) is discharged into an unnamed freshwater stream or river.

Trade discharges (site drainage) are discharged into Is Y Coed Brook approximately 470m west of the site, from CPL Petroleum on Bryn Lane, LL13 9UT.

4.3 Landfill and Pollution

The Envirocheck Report records one historic landfill site within 1km of the study area located approximately 300m south. Inert waste and liquid sludge was reported to be deposited between January 1968 and December 1977.

The nearest licence waste management facility is a metal recycling site located approximately 320m west of the site. A household waste recycling centre is located approximately 465m west of the site.

The nearest recorded registered landfill site is located approximately 875m southwest of the study area. The Envirocheck Report states that the site is closed and accepted between 10,000T and 25000T of special waste per year.

There are no recorded instances of infilled land within the study area, the nearest is a former pond approximately 85m to the east.

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5 PRELIMINARY UNEXPLODED ORDNANCE RISK ASSESSMENT

Military activities including those conducted as part of both the First and Second World Wars have resulted in a legacy of unexploded ordnance (UXO) being present within the shallow soils of the UK.

UXO result from various sources including both allied (military training) and German (bombing raids) with a guide figure of approximately 10% of all munitions failing to function as designed.

An assessment of the likelihood of being UXO encountered has been undertaken to advise any intrusive ground investigation in the event that this is undertaken by Curtins. This risk is influenced by a number of factors including the proximity to strategic targets, the nature of the works being undertaken and evidence of local damage in the post-war periods amongst others. In order to determine the likelihood of UXO being present on a site, a stepwise risk assessment process is followed. This process is outlined within CIRIA C681 Unexploded Ordnance: A Guide for the Construction Industry (Ref. 8).

5.1 Preliminary UXO Assessment

It should be noted that the following assessment will only be applicable to future works with respect to ground investigation works completed by Curtins only. This may include trial pitting and/or boreholes to determine the nature of the ground conditions for geo-environmental and geotechnical information. Where the client is looking to determine the risk from UXO throughout the enabling works and construction phase of the below ground level development, the Principal Contractor appointed for the enabling and construction works must undertake their own risk assessment, with reference to their specific scope of works.

The risk presented by Unexploded Ordnance, identified using preliminary Unexploded Bomb (UXB) risk maps retrieved from Zetica UXO (Ref. 9), indicates that the site is situated in a designated **Low**-Risk area in respect to the potential presence of UXO as a result of World War Two bombing. Low risk areas are defined as regions that show a bomb density of 10 bombs per 1000 acres or fewer.

The Envirocheck Report historical mapping (Ref. 3) indicates the site was occupied by agricultural land with no industrial land use, or Luftwaffe Targets on site. Mapping records do not indicate any ruins, or buildings that were no longer recorded in post-WWII mapping records, on or surrounding the site.

Based on the forgoing commentary, the likelihood of encountering UXO on site as part of any Curtins intrusive ground investigation works is **Low**.

If unexploded ordnance is discovered, stop immediately, prevent access to the area, and inform the police. If the site boundary or location changes then the UXO risk should be reassessed.

Where the client is looking to determine the risk from UXO throughout the enabling works and construction phase of the below ground level development, the Principal Contractor appointed for the enabling and construction works must undertake their own risk assessment, with reference to their specific scope of works.

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6 CONCEPTUAL SITE MODEL & QUALITATIVE RISK ASSESSMENT

The conceptual site model (CSM) and Qualitative Risk Assessment (QRA) are presented in the table presented in this section.

The CSM details the source-pathway-receptor linkages or potential pollutant linkages (PPL) that have been identified for the site. The QRA details the associated level of risk relating to these potential pollutant linkages.

The CSM and QRA concern risk to human health and water environment with additional, more specific risk assessment protocols contained within the main body of this reporting, as detailed in *Section 6.1* below.

The QRA follows the framework outlined within CIRIA C552 which is summarised within *Appendix C.*

The 'risk rating' within the QRA refers to the risk that the source, pathway, receptor linkage or PPL is complete. Unless specifically stated it does not necessarily refer to an immediate risk and is intended to be used as a tool to assess the necessity for further assessment/investigation.

6.1 Additional Risk Assessments

The following risk assessments, listed below, are not included within the main CSM and QRA but none-the-less can be of critical importance to the onward development of the site.

- The risk presented by Mining is discussed and assessed in Section 4.1.1.
- The risk presented by Radon is discussed and assessed in Section 4.1.3.
- The risk presented by Unexploded Ordnance is discussed and assessed in Section 5.1.

Under current health and safety legislation, employers are required to carry out their own appropriate risk assessments and mitigation to protect themselves and their employees, other human receptors, and the environment from potential contamination. Such risks must be adequately mitigated by law, specifically the Construction Design Management (CDM) Regulations (2015) (Ref. 10) which require that potential risks to human health and the environment from construction activities are appropriately identified and all necessary steps taken to eliminate / manage that risk. It has been assumed that any future construction works on site will be undertaken in compliance with these requirements.

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Qualitative Risk Assessment → Generic Quantitative Risk Assessment → Detailed Quantitative Risk Assessment or; Remedial Action

- The table below represents the first stage in the land quality risk assessment process: The Qualitative Risk Assessment.
- For a development site to be deemed 'suitable for use', the level of risk needs to be brought down to acceptable levels, i.e. low to negligible risk. The purpose of each stage of risk assessment is ultimately to establish, if there is a requirement for additional levels of assessment to be made to have sufficient confidence to support a risk characterisation or management decision, e.g. remedial action.
- In the absence of specific site data, a Generic Quantitative Risk Assessment is invariably recommended.

Table 7 – Preliminary Conceptual Site Model

Conceptual Site Model			Qualitative Risk Assessment			
Source	**Pathway(s)**	**Receptor(s)**	**Consequence**	**Likelihood of Occurrence**	**Risk Rating**	**Recommended Actions**
On-Site Sources of Potential Contamination: • Potential for uncontrolled deposition during the construction and demolition of the Fibreglass works on site. • Asbestos materials may be present in soils accounting for the period in which the factory was constructed. • Potential contaminants associated with the fibreglass manufacturing works/processing and associated infrastructure (See Section 7.1) including: o Spillages/leakages from storage tanks o Manufacturing/processing works o Leakage/spillage of fuel oils from HGVs and other factory traffic. o PCB leakages/spillages from sub-stations **Off-site Sources of Potential Contamination:** • Mobile contaminants sourced from fibreglass manufacturing and processing works, and associated infrastructure. • Potential for uncontrolled deposition of Made Ground during the infilling of off-site ponds.	**Direct contact, ingestion, inhalation (dust and vapours)**	**End user of site (Industrial)**	**Medium** Chronic health risk	**Low Likelihood** Historic site use may give rise to soil contamination beneath the site. Sub-structures and remnants of historic tanks remain in-situ in the southeast of the site. Notwithstanding, development proposals comprise the construction of new industrial warehouses with associated infrastructure works, and external hardstanding. Limited soft landscaping is included in development proposals. The presence of hardstanding and the buildings footprint will break the source pathway receptor linkage for direct contact, and ingestion of potentially contaminated soils. There is potential for volatile contamination within Made Ground soils. Soil chemical analysis should include contaminants of concern listed in Section 7.1.	**Moderate/ Low**	**Ground Investigation** **Generic Quantitative Risk Assessment.**
		Construction Workers	**Medium** Chronic health risk	**Likely** Accounts for construction and maintenance workers being provided appropriate PPE and sanitary facilities during the ground investigation, in accordance with their RAMS, to reduce exposure to potential contaminants during their works.	**Moderate**	**Ground Investigation** **Construction Workers should be provided with appropriate PPE and sanitary facilities, with consideration of ground conditions environmental chemical analysis determined through ground investigation.**
	Vertical migration of mobile contamination in perched water / groundwater through the superficial deposits Physical processes including; capillary action and downwards into the natural deposits through infiltration.	**Controlled Waters** (Groundwater) Secondary Undifferentiated Aquifer in the superficial deposits. Principal Aquifer in the bedrock deposits. Site is not located within a Source Protection Zone. There closest potable groundwater abstraction is a well located 948m north east of the site, for farming and domestic use.	**Medium** Pollution of sensitive water resources	**Unlikely** BGS recorded borehole logs indicate a substantial thickness of cohesive Glacial Till (Aquitard) which would limit downward migration of mobile contamination. It is considered unlikely that a pathway between potential shallow ground contamination and sensitive aquifer exists. In absence of a viable source-pathway-receptor linkage, the risk to groundwater is considered to be low.	**Low**	**Ground Investigation** Should evidence of gross contamination in soil or groundwater be encountered during ground investigation, groundwater samples should be taken, the risk should be reassessed and Generic Quantitative Risk Assessment carried out.
	Horizontal migration of mobile contamination in perched water / groundwater over and through the superficial deposits (soils) May occur due to the influence of perched or natural groundwater flow patterns and natural or man-made high permeability zones, e.g. sand lenses or drainage runs.	**Controlled Waters (Surface Water)** Nearest surface water feature is a drainage ditch (low sensitivity)in the east of the site. Various surface water ponds (low sensitivity) in proximity to the site. No surface water abstraction points within 1km.	**Mild** Pollution of non-sensitive water resources	**Low Likelihood** The nearest surface water receptor is a drainage ditch in the east of the site, flowing north towards the River Dee, approximately 2.5km from the site. Ponds are located directly north and east of the site, and a large pond is located south of the sub-station, south of the site. Several ponds are also recorded in the wider setting to the north, east south and west. The is a low likelihood that leachable or mobile contamination may flow over the underlying superficial soils as perched water through Made Ground, towards the drainage ditch or other surface water features in the immediate vicinity of the site. Installation of suitable surface water drainage and hardstanding will limit potential for water ingress facilitating additional mobilisation of contamination. Should evidence of gross contamination in soil or groundwater be encountered during ground investigation, groundwater samples should be taken, to further assess the risk to surface water features. If no visual or olfactory evidence of contamination is identified during the ground investigation, no further action is required.	**Low**	

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Conceptual Site Model			Qualitative Risk Assessment			
Source	Pathway(s)	Receptor(s)	Consequence	Likelihood of Occurrence	Risk Rating	Recommended Actions
On and off-site soils with the potential to generate ground gases: • Organic materials in Made Ground soils • Limited potential for ground gas generation due to the potentially infilled ponds adjacent and near to the site.	**Vertical and horizontal migration through existing service corridors and the underlying superficial deposits**	**End user of site**	**Medium** Acute health risk, e.g. asphyxiation or risk from explosion	**Low Likelihood** Made Ground and natural soils are likely to have very low to low gas generating potential (BS8576 (2013). It is recommended that ground gas monitoring is undertaken during the ground investigation to further characterise the ground gas risk for the proposed development.	**Moderate/ Low**	**Ground investigation** **Ground gas monitoring and ground gas risk assessment**

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7 CONCLUSION AND RECOMMENDATIONS

The qualitative risk assessment (QRA) determined a varied level of level of risk associated with the proposed development, with respect to human health and controlled waters.

The QRA concluded by recommending that generic quantitative risk assessments (GQRA) were conducted to confirm the assessment of risk ascribed to each of the respective potential pollutant linkages (PPLs). It is recommended that the GQRA is conducted as part of a ground investigation in support of the engineering design of the proposed development an outline scope for which is detailed in the section hereafter.

In summary, the following recommendations are made:

- Undertake an intrusive ground investigation to collect chemical and geotechnical samples to inform revised conceptual site model and geotechnical assessment.
- Undertake an intrusive ground investigation to include the installation of ground gas and groundwater monitoring wells.
- Undertake a GQRA as part of the ground investigation to refine the Conceptual Site Model and further assess contaminated land risks.
- Undertake ground gas monitoring as part of the ground investigation.
- Where visual or olfactory evidence of ground or groundwater contamination is identified, undertake groundwater chemical analysis to assess risks to surface water features (e.g. drainage ditch, nearby ponds).

It is further recommended that this work is completed in advance of any development works taking place.

7.1 Contaminants of Concern

Based on the Site History, the potential contaminants of concern include but are not limited to: broad range aliphatic and aromatic hydrocarbons present within any fuel oils; polycyclic aromatic hydrocarbons (PAHs); inorganic compounds including heavy metals, semi-volatile and volatile organic compounds, PCBs and asbestos.

7.2 Other Considerations

Residual obstructions may be present in the ground associated with the historic fiberglass factory building and associated structures. Tank sub-structures remain in place in the southeast of the site, and may be present elsewhere on site. There is potential for unrecorded below ground tanks, voids or structures associated with the historic fibreglass factory to be present beneath the site. It is recommended that site records of tanks are provided where available, the local authority and fire and rescue service should also be contacted to request records they may hold on the historic tanks on site ahead of investigation works.

Substantial site level changes are present on site, included an approximately 3m reduction in levels (south to north) at the retaining wall. Development proposals should consider the implications of existing and proposed level changes. Earthworks (e.g. Cut and Fill exercise) may be required to form a development platform.

The requirement for additional surveys, e.g. arboricultural survey, archaeological and ecological surveys, should be confirmed through advice from a suitably qualified and experienced professional.

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8 REFERENCES

1. **Jones Hargreaves Building & Project Consultants** (2023) Wrexham Industrial Estate, Wrexham Feasibility Report revision B (23020_Wrexham-Feasibility report_B)
2. **Environment Agency** (2021) Land Contamination Risk Management (LCRM) (last updated July 2023).
3. **Landmark** (2026) Envirocheck Report (Report No. 396112609_1_1).
4. **British Geological Society** (BGS) Solid and Drift 1:50,000 mapping, Sheet No. 121 (Wrexham).
5. **BGS GeoIndex** [online] Accessed at: GeoIndex - British Geological Survey (bgs.ac.uk) (accessed March 2026).
6. **The Mining Remediation Authority** Interactive Map Viewer [online] Accessed at: Mining Remediation Authority Map Viewer (accessed February 2026).
7. **UK Maps of Radon** [online] Accessed at: UKradon - UK maps of radon (accessed March 2026).
8. **CIRIA** (2009) Unexploded Ordnance: A Guide for the Construction Industry (Report no. C681).
9. **Zetica Risk Maps** (UXO) [online] Accessed at: Risk Maps | Zetica UXO (accessed March 2026).
10. **Health and Safety Executive** (2015) Construction (Design and Management) Regulations.

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9 APPENDICES

Appendix A – Drawings

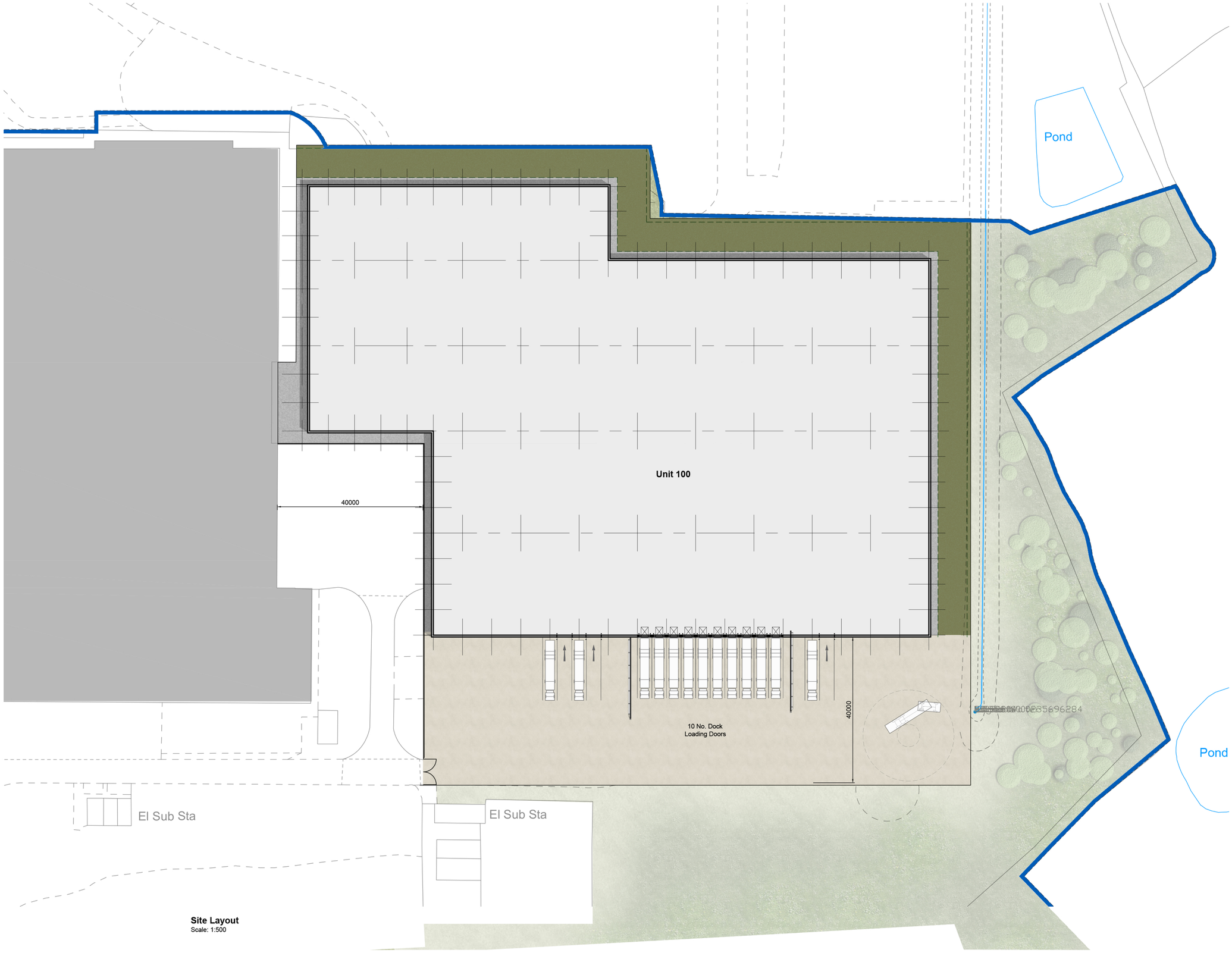
Appendix B – Envirocheck Report

Appendix C – Qualitative Risk Assessment Rationale

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Appendix A

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Site Layout
Scale: 1:500

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General Notes

- This document is to be used for the stated purpose only and should not be used for any other.
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- It is the recipients responsibility to print this document to the correct size & scale.
- All relevant drawings and specifications should be read in conjunction with this document.
- Scaling of this document is not recommended.

North

Document Scale(s)

10m SCALE 1:500

10m SCALE 1:2000

Boundary Notes

The site boundary indicated is taken from Title Plan ref: CYM647568. Please note this information has been provided in scanned .pdf format and is subject to further clarification.

Schedule of accommodation

Total GIA - 16,320 sqm (175,667 sqft)

Project Name

Wrexham Industrial Estate, Bryn Lane

Employer	Project Address
Elite Onyx Properties (UK) SARL	**LL13 9UT**

RIBA Workstage	Suitability
1 - Preparation and Brief	**S2 - Information**

Drawn	Checked	Created	Size
LTS	**SH**	**09.03.2026**	**A1**

UMC Project Reference	Scale	LOD	LOI
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Document Title

Site Layout Option 01 (no office)

Document Reference

26073 - UMC - ZZZZ - SI - DR - A - 0111

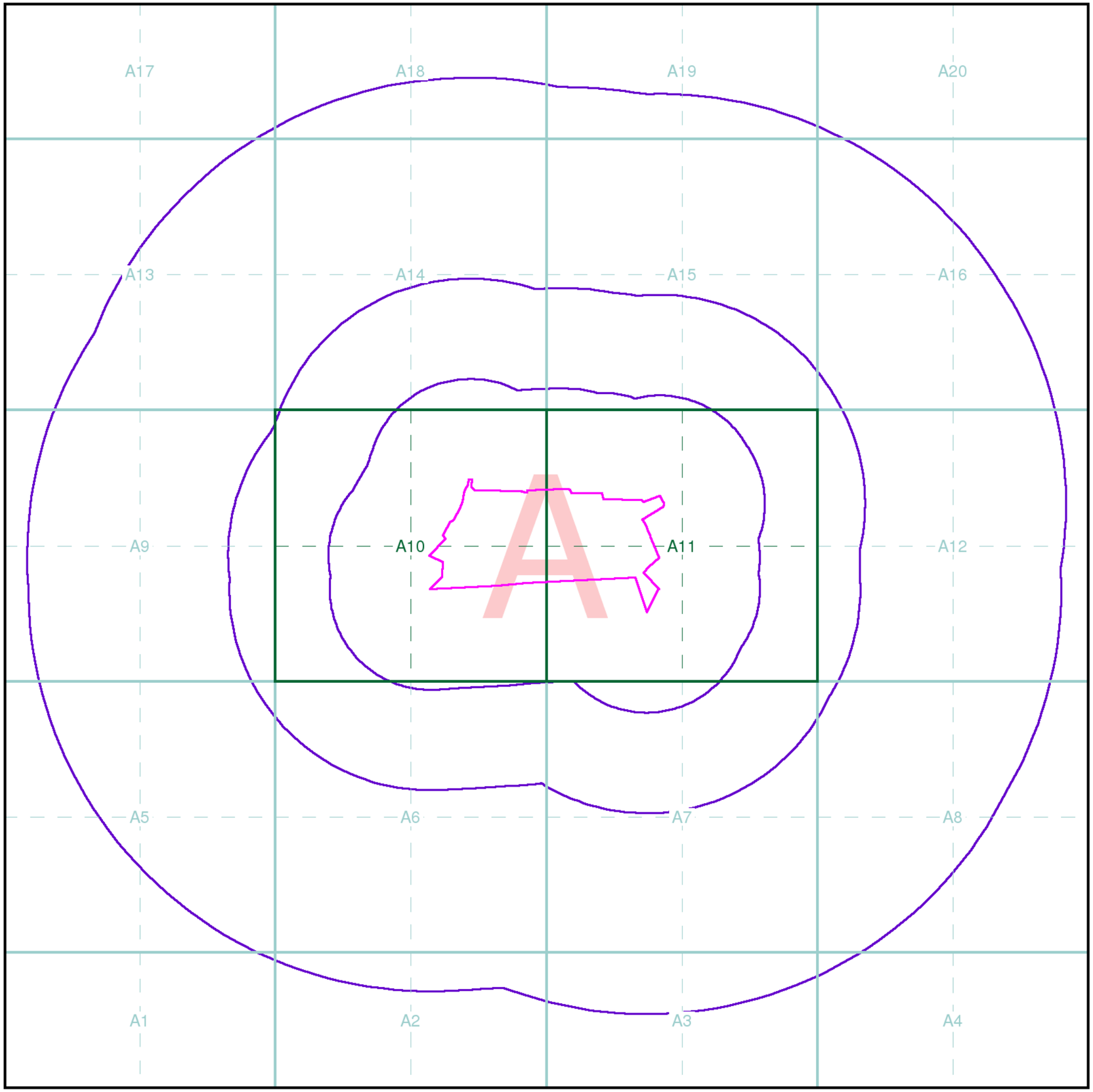
Revision Note

Initial Issue

Issue Date	Status	Current Revision
09.03.2026		**P01**

Appendix B

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Index Map

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

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

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

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

A selection of organisations who provide data within this report:

Map data

British Geological Survey
NATURAL ENVIRONMENT RESEARCH COUNCIL

Cyfoeth Naturiol Cymru
Natural Resources Wales

Envirocheck reports are compiled from 136 different sources of data.

Client Details
Mr J Provis, Curtins Consulting Ltd, Merchant Exchange, 17-19 Whitworth Street West, Manchester, M1 5WG

Order Details
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Search Buffer (m):	1000

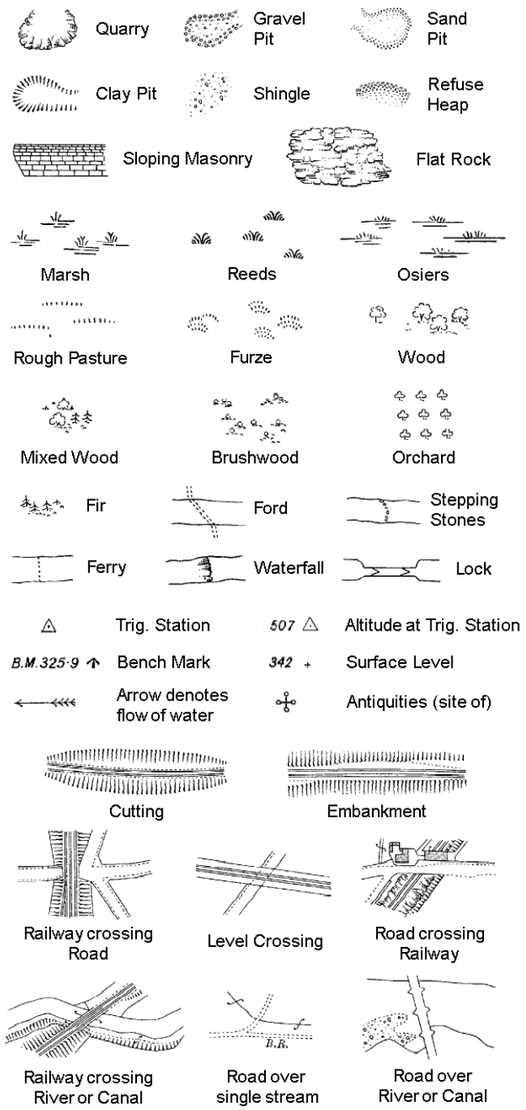
Site Details
T D G Logistics, Bryn Lane Warehouse, Bryn Lane, Wrexham, LL13 9UT

Full Terms and Conditions can be found on the following link:
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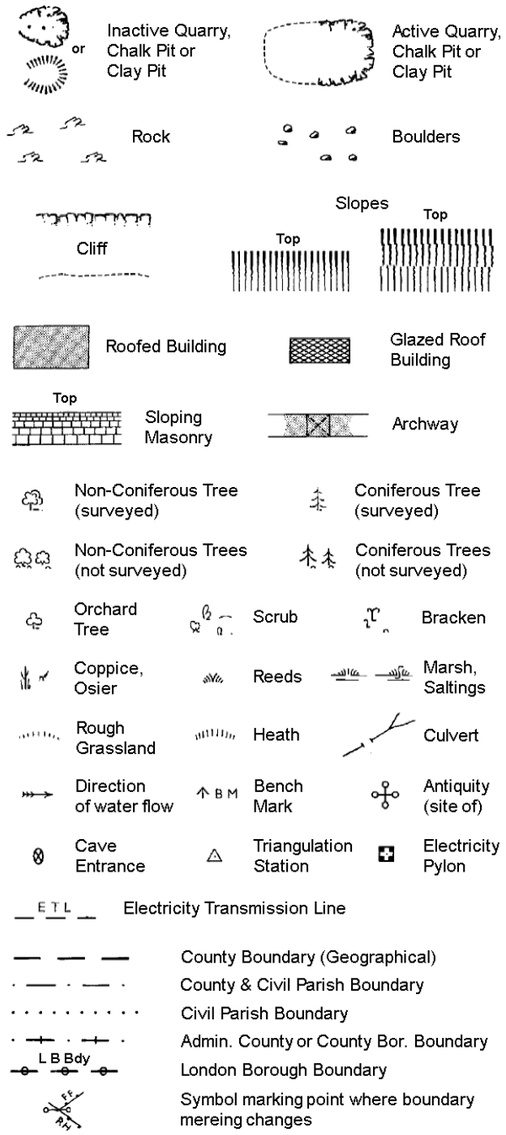
Historical Mapping Legends

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



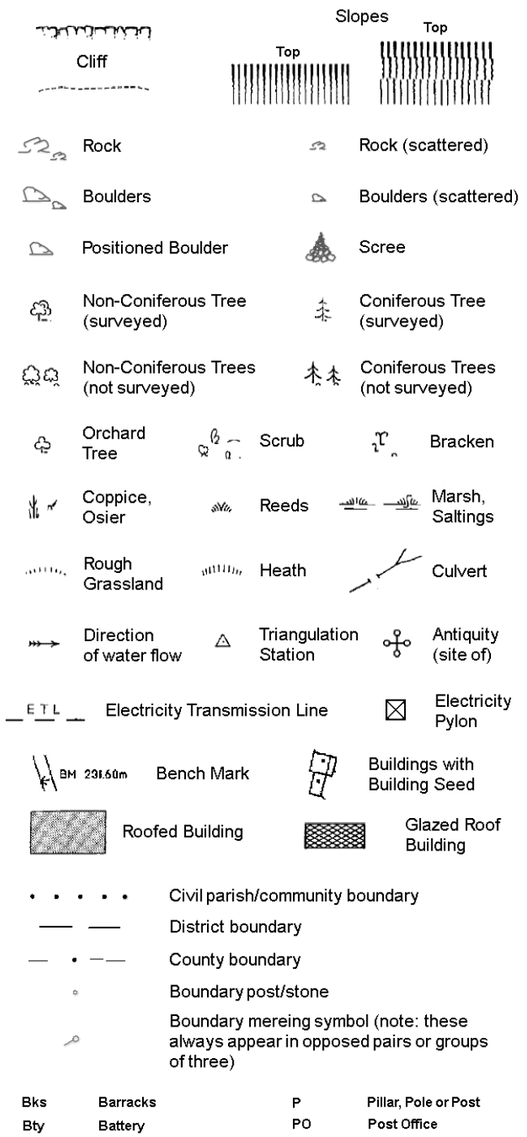
B P B S	Boundary Post or Stone	P.C.B	Police Call Box
B.R.	Bridle Road	P	Pump
E.P	Electricity Pylon	S.P	Signal Post
F.B.	Foot Bridge	St.	Sluice
F.P.	Foot Path	Sp.	Spring
G.P	Guide Post or Board	T.C.B	Telephone Call Box
M.S	Mile Stone	Tr.	Trough
M.P M.R	Mooring Post or Ring	W	Well

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



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

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



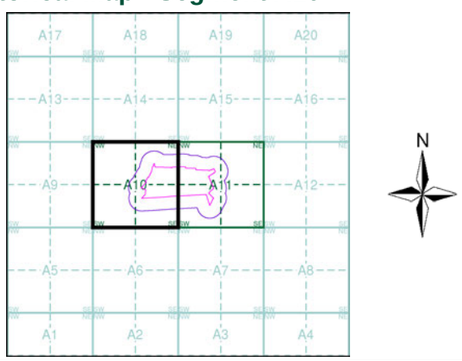
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Bty	Battery	PO	Post Office
Cemy	Cemetery	PC	Public Convenience
Chy	Chimney	Pp	Pump
Cis	Cistern	Ppg Sta	Pumping Station
Dismtd Rly	Dismantled Railway	PW	Place of Worship
El Gen Sta	Electricity Generating Station	Sewage Ppg Sta	Sewage Pumping Station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

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Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Denbighshire	1:2,500	1873	2
Denbighshire	1:2,500	1899	3
Denbighshire	1:2,500	1911	4
Ordnance Survey Plan	1:2,500	1961	5
Ordnance Survey Plan	1:2,500	1972 - 1974	6
Additional SIMs	1:2,500	1982 - 1990	7
Additional SIMs	1:2,500	1987 - 1990	8
Additional SIMs	1:2,500	1989	9
Additional SIMs	1:2,500	1990	10
Ordnance Survey Plan	1:2,500	1992	11
Large-Scale National Grid Data	1:2,500	1992	12
Large-Scale National Grid Data	1:2,500	1993 - 1994	13
Large-Scale National Grid Data	1:2,500	1994	14
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Historical Aerial Photography	1:2,500	2003	16

Historical Map - Segment A10



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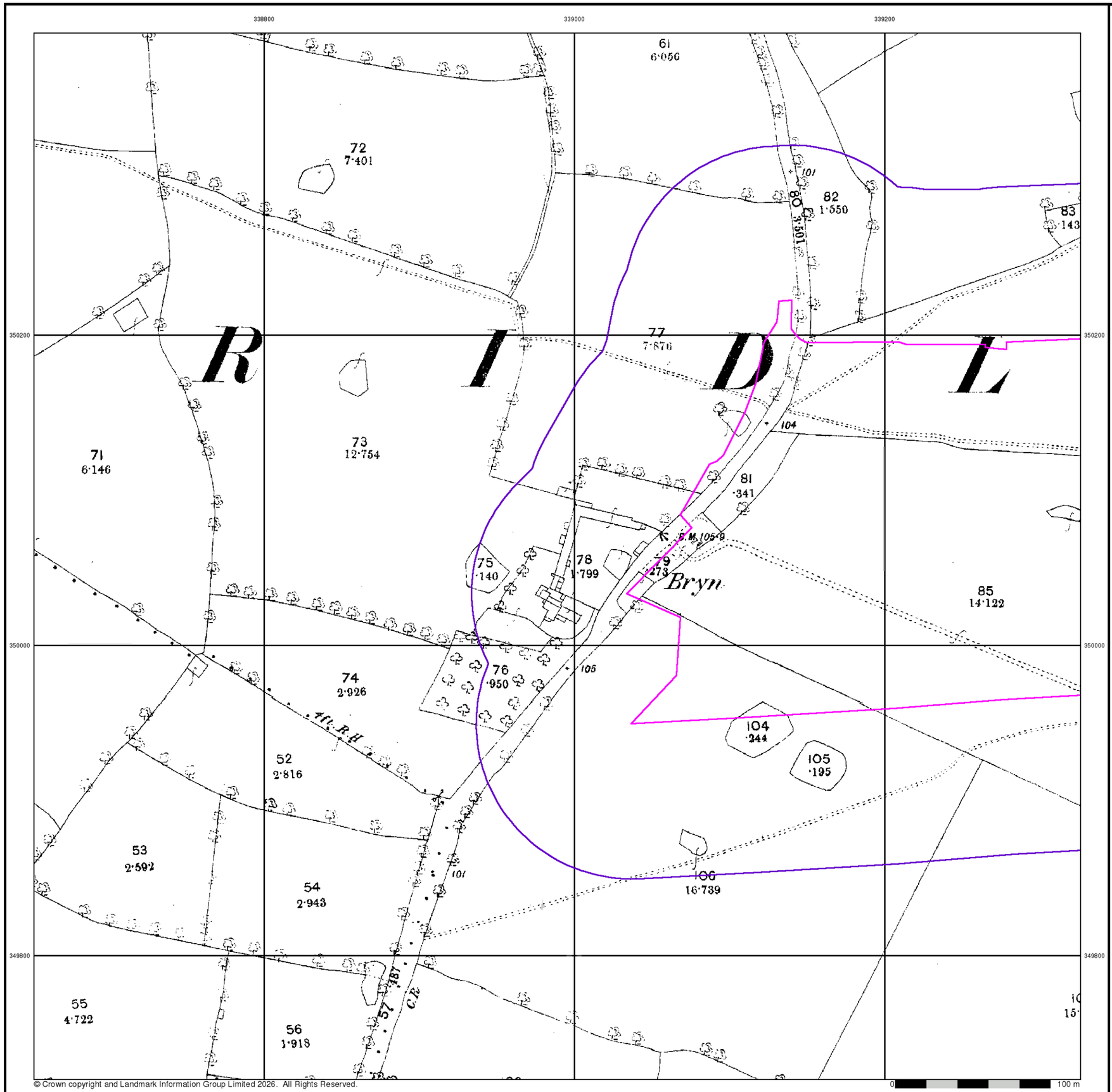
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Search Buffer (m):	100

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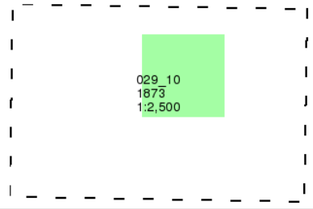
Denbighshire

Published 1873

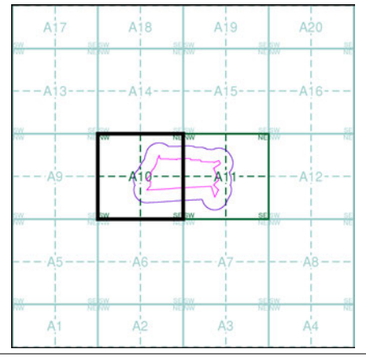
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Map Name(s) and Date(s)



Historical Map - Segment A10



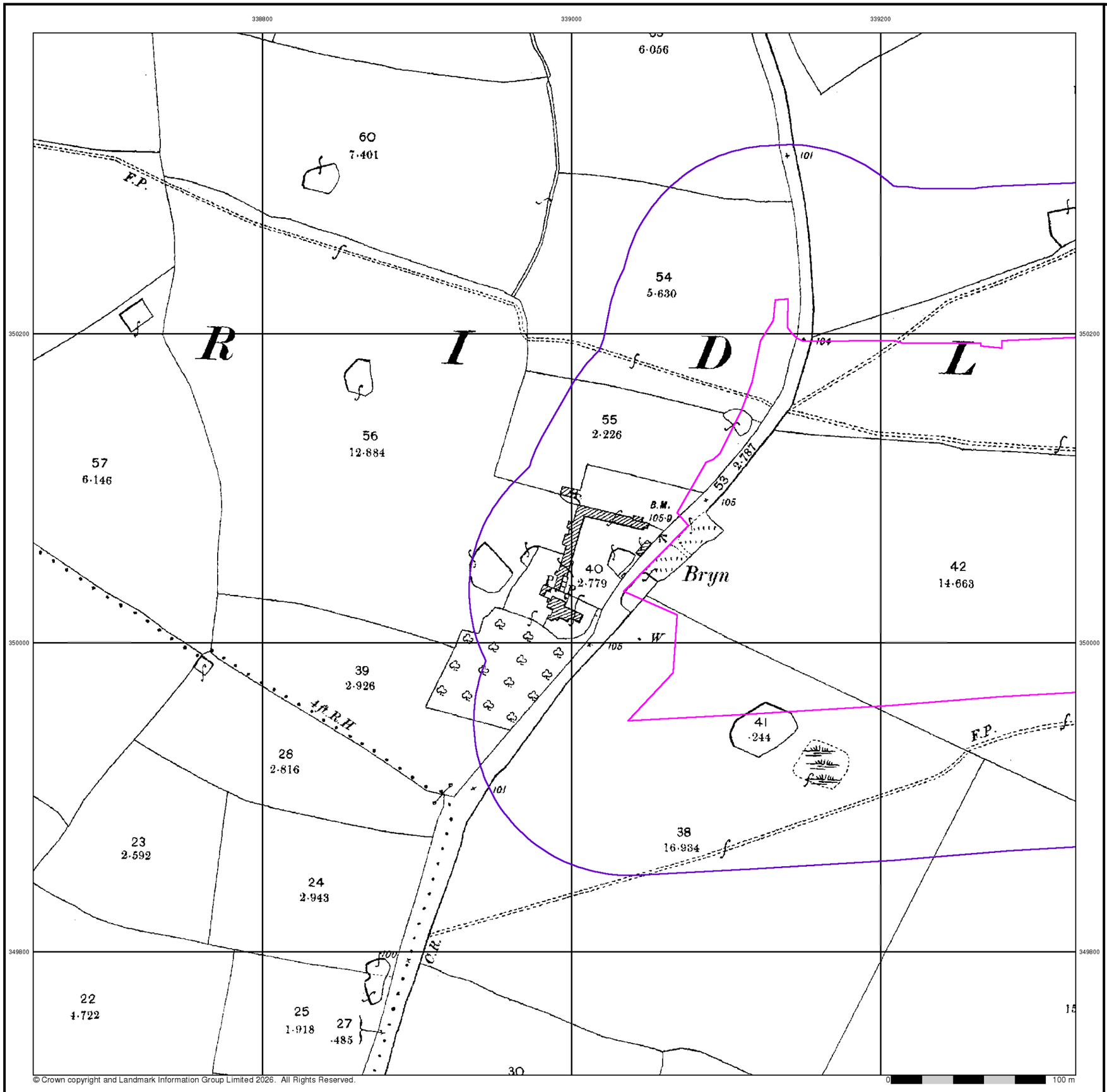
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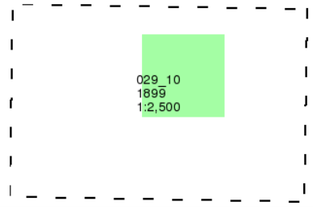
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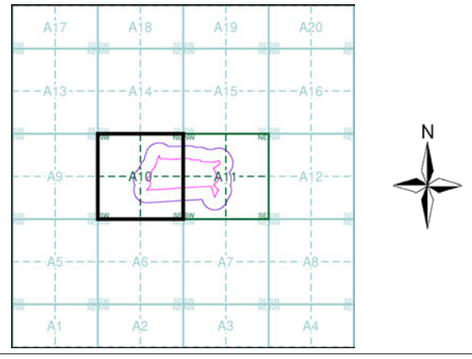
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