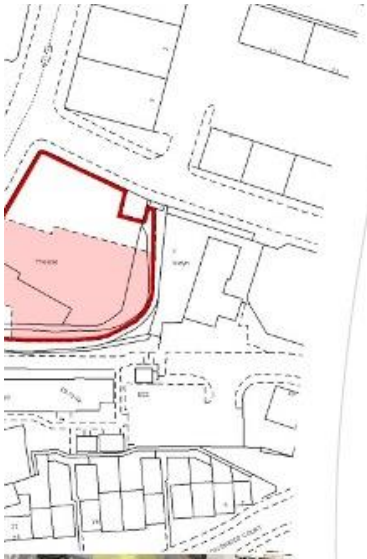







EARTH ENVIRONMENTAL
& GEOTECHNICAL

# Phase 1 GeoEnvironmental Desk Study

## Salop Road
## Wrexham

December 2021

On behalf of

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# SALOP ROAD

# WREXHAM

# PHASE I GEOENVIRONMENTAL DESK STUDY

# FOR

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**Report No. A4428/21** **DECEMBER 2021**

| | |
|---|---|
| **Report Title:** | **Salop Road, Wrexham**<br>**Phase I GeoEnvironmental Desk Study** |
| **Report Reference:** | **A4428/21** |
| **Client:** | **P1 Speedyfit Ltd** |
| **Issue Date:** | **6th December 2021** |
| **Drafted By:** | **H Richards** |
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# 1.0 INTRODUCTION

## Appointment

1.1 Earth Environmental & Geotechnical Ltd has been commissioned by P1 Speedyfit Ltd (the Client) to undertake a Phase I GeoEnvironmental Desk Study for the proposed development on the land at the junction of Salop Road and Rivulet, Wrexham.

1.2 It is understood that the Client wishes to construct a car wash and car maintenance centre comprising of a 405m$^2$ steel framed building, with a corrugated plastic roof, an antivandal security cabin, canopies, and water protection screen, all of which is designed to be dismantled.

1.3 It is understood that the new unit will be a portal framed building with shallow foundations.

1.4 Vehicle access is currently from Rivulet Road to the north of the site 13m from the junction with Salop Road.

1.5 Proposed development plans for the site are shown in Figure 1 and 2 below and overleaf.

**Figure 1 Proposed Development Plan**

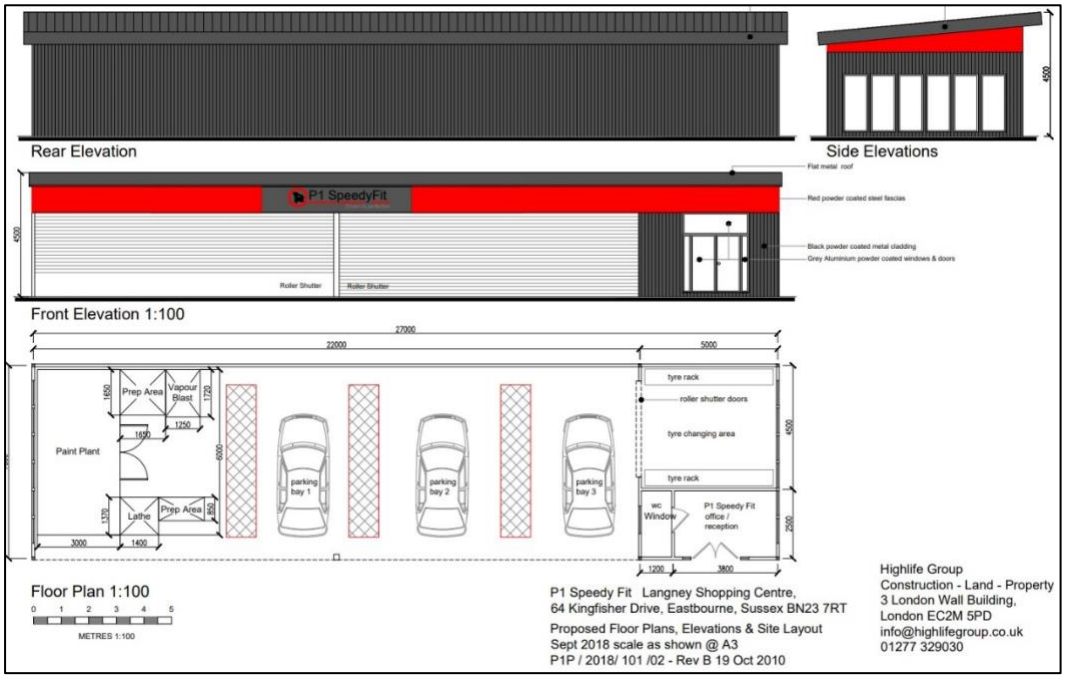
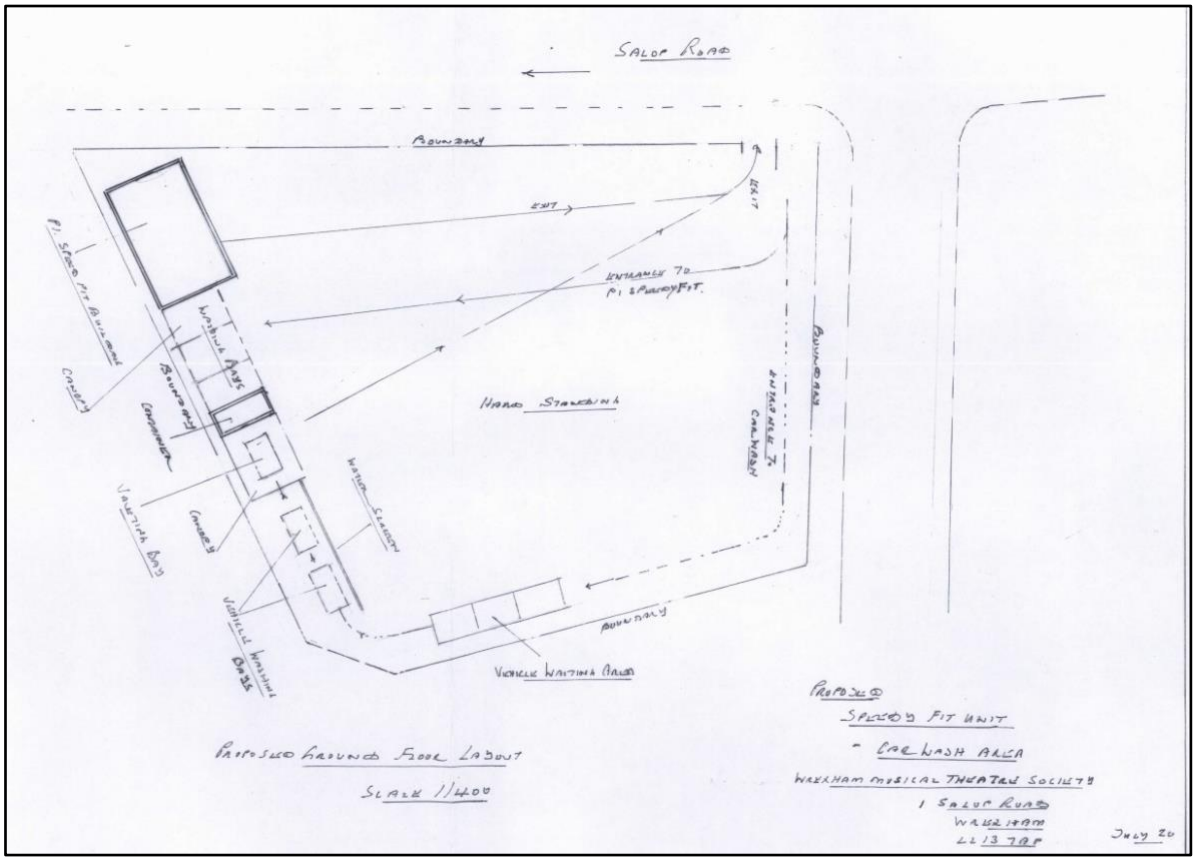


**Figure 2 Proposed Development Plan 2**




## Objective

1.6 The purpose of the Desk Study is to collate available geological and environmental data for the site (and its environment) and provide a preliminary geotechnical and geo-environmental appraisal, with a site-specific conceptual model. This enables a preliminary assessment of geo-environmental risks to be undertaken and, if necessary, provides information for the design of a Phase 2 Ground Investigation.

## Scope

1.7 The Phase I Environmental Desk Study comprises of a site reconnaissance visit and a review of the following information sources, some of which was provided by the client.

- British Geological Survey online maps.
- Google Earth imagery.
- Environment Agency online mapping data.
- Historical Ordnance Survey maps.
- The site and surrounding areas environmental, geological, and mining data presented in the site specific GroundSure Reports (Appendix 1).
- Coal Authority Interactive Viewer.
- Weetwood, Flood Consequences Assessment, 1 Salop Road, Wrexham, June 2021.
- Wrexham County Borough Council Planning Portal.

## 2.0 SITE LOCATION AND DESCRIPTION

2.1 The site is in Wrexham, Wales, approximately 0.5 km to the south of Wrexham Town Centre. The approximate National Grid Reference for the centre of the site is SJ 33736 49936 (X: 333736, Y: 349936) with the closest postcode being LL13 8DL.

2.2 The site is an irregular shaped parcel of land with current access via locked gates on Rivulet Road to the north of the site. The maximum dimensions of the proposed site are 55m northeast-southwest 45m northwest to southeast. The site occupies an area of approximately 0.15 hectares.

2.3 The site is currently vacant and surrounded by a low brick wall and having some asphalt hard standing with a few shrubs and tree saplings which have taken hold in the rubble in the southern third of the site.

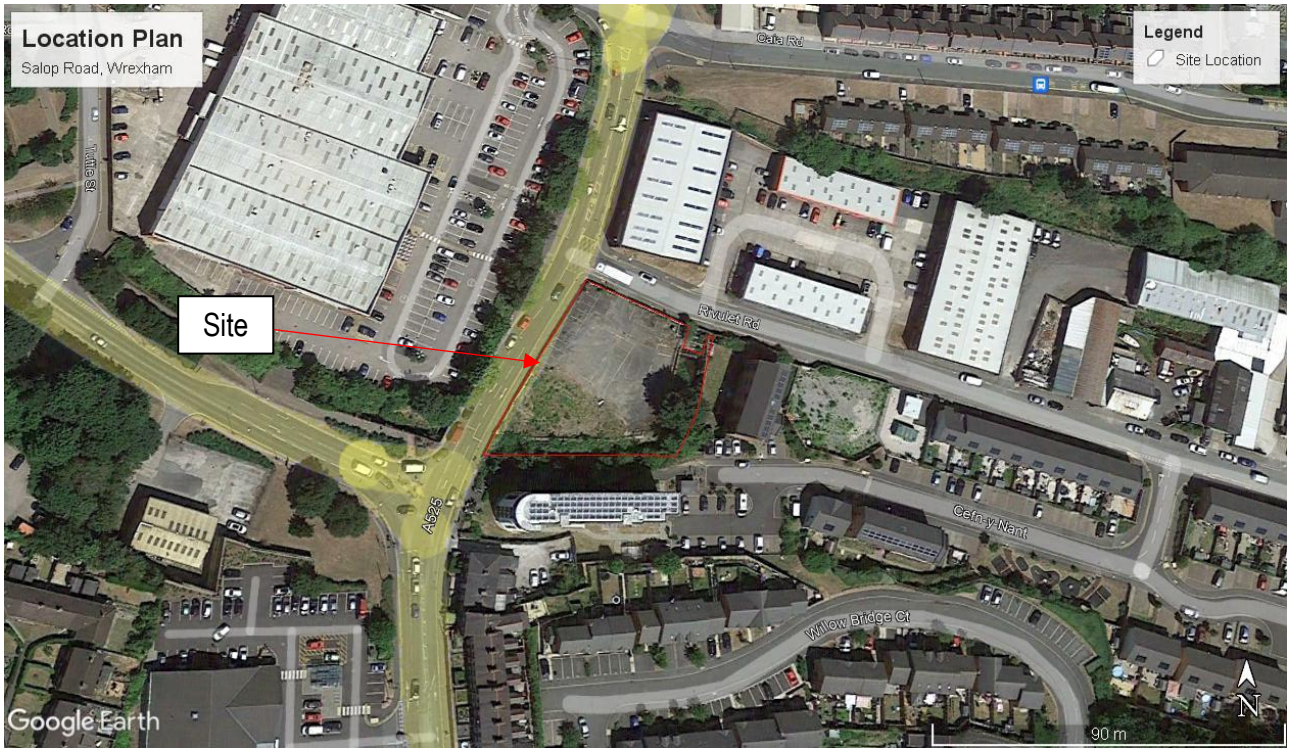
2.4 There is a river (Afon Gwenfro) flowing under Willow Bridge on Salop Road at the southwest corner of the site, which follows the site boundary on its southern and eastern sides and flows north.

2.5 Wrexham Musical Theatre previously occupied the site and was demolished in 2016.

2.6 The general surrounding area comprises of a mix of late 19th Century brick terrace residential housing along with light industrial units, clothing retail outlets, supermarkets and building suppliers.

2.7 A location plan is shown below as Figure 2, together with a recent site photograph as Figure 3 (overleaf).

## Figure 3 Site Location Plan




## Figure 4 Site Photograph



**Site Utility Services**

2.8 As the site was occupied by a former theatre, connections for water, electricity and foul drainage are present. Site service plans have not been obtained for the site on behalf of the client.

2.9 The status of all services should be checked prior to any development (including site investigation) commencing.

## 3.0 ENVIRONMENTAL SETTING

3.1 The geology of the site is covered by British Geological Survey (BGS) online data and the site specific GroundSure Enviro+Geo Insight report (Appendix 1).

3.2 Environmental conditions are covered by Environment Agency (EA) and British Geological Survey (BGS) online data, and the site specific GroundSure Enviro+Geo Insight report (Appendix 1).

### Geology

3.3 The BGS states that the site is underlain by artificial made ground deposits.

3.4 The site is underlain by superficial deposits of Alluvium (silt sand and gravel) and Clay.

3.5 The solid geology beneath the site is shown to be the Westphalian Salop Formation comprising of mudstone, sandstone, and conglomerate.

3.6 There are 2 records of linear features within 500m of the site boundary. The closest record refers to an inferred normal fault 338m west of the site.

3.7 There are no records of landslips within 500m of the site.

3.8 There are 24 BGS borehole records identified within 250m of the site. There is a borehole recorded on site referred to as Cambrian Leather Works (B) drilled to 9.1 m by the Welsh National Water Development Authority. No further information is available.

3.9 The site is in an area where the hazard rating is very low about running sands, shrink swell clays, compressible deposits, and landslides. The hazard rating is negligible about collapsible deposits and the dissolution of soluble rocks.

### Ground Workings

3.10 There are 9 records of historical surface ground working features identified within 250m of the site boundary. The closest record refers to unspecified ground workings located 188m east of the site, dated 1910. Other records in the vicinity refer to unspecified workings and pits and a graveyard (199m northwest of the site)

### Mining and Other Underground Workings

3.11 The site is located within an identified coal mining area. Reference to the Coal Authority Interactive viewer shows the site is not located within a Development High Risk Area.

3.12 There are 2 records of non-coal mining areas located within 1km of the site These refer to sporadic, vein mineral extraction. The closest being 334m west of the site.

3.13 There are no areas of brine extraction, gypsum extraction, tin mining, or clay mining on the site.

3.14 There are no records of natural cavities within 500m of the site.

3.15 There are no records for historical underground working features identified within 1km of the site.

**Radon Potential**

3.16 The site is in a Radon Affected Area where between 5% - 10% of the properties are above the Action Level. Therefore, basic radon protection measures are required.

**Hydrogeology and Hydrology**

3.17 The superficial deposits are classified by the Environment Agency (EA) as a Secondary A Aquifer The Alluvial deposits of sand and gravel have an intergranular flow type and a very high to very low permeability. The BGS states the following:

> ***Secondary A Aquifer*** *'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.'*

3.18 The Salop Formation is classified by the Environment Agency (EA) as a Secondary A Aquifer.

3.19 The Salop Formation has a well-connected fracture flow type and a moderate to low permeability. The BGS states the following:

> ***Secondary A Aquifer*** *'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.'*

3.20 The groundwater vulnerability and soil leaching potential of the site has been classified as a high vulnerability in the secondary aquifer of the superficial deposits. The BGS states:

> *'High Vulnerability – Areas able to easily transmit pollution to groundwater. They are likely to be characterised by high leaching soils and absence of low permeability superficial deposits.*

3.21 There are 4 ground water abstraction licence records within 2km of the site. The closest record is un-named and is located 1km northeast of the site.

3.22 There are 7 surface water abstraction licence records within 2km of the site. The closest record refers to a historical effluent dilution licence to extract water from the River Gwenfro held by Wrexham County Borough located 567m northwest of the site.

3.23 There is 1 potable water abstraction licence record within 2km of the site relating to a historical licence belonging to the National Trust.

3.24 The site is not located within 500m of a Source Protection Zone or Source Protection Zone within a confined aquifer.

3.25 There are 9 water network entries within 250m of the site all relating to the non-tidal river Afron Gwenfro which is largely culverted through Wrexham town centre. The closest record is 1m east of the site and contains water year-round.

3.26 There are 7 surface water features identified within 250m of the site, all of which refer to the River Afron Gwenfro.

3.27 There is 1 records of a Water Framework Directive (WDF) surface water body located on site. The onsite record refers to the River Afron Gwenfro catchment. The water body had a failed chemical rating and good ecological rating in 2016.

3.28 There is 1 record of a Water Framework Directive (WDF) groundwater body located on-site. The record refers to the Dee Carboniferous Coal Measures which had a poor chemical rating in 2016.

**Landfill & Waste Management Activity**

3.29 There are no records for current Environment Agency/Natural Resource Wales landfill records within 500m of the site.

3.30 There are 2 records of historic landfill sites identified from Local Authority and high detail historical mapping, within 500m of the site.

3.31 There are 2 records of historic Environment Agency/Natural Resource Wales landfill sites within 500m of the site. The closest being Dunks No2 landfill, operated by Wrexham Borough Council 450m to the east.

3.32 There are no records of BGS/DoE non-operational landfill sites within 500m of the site.

3.33 There are 2 records of a historical landfill from the Local Authority and Historical Mapping records within 500m of the site. The closest being Parciau 479m west of the site.

3.34 There are 9 records of a waste treatment, transfer, or disposal site within 500m of the site. The closest record is held by Cambrian Electrical Factors Ltd for the storage of waste in a secure place, located 53m northeast of the site.

3.35 There are 3 records of historical waste sites within 500m of the site. The closest record refers to a “refuse destructor” dated 1912, located 75m west of the site.

3.36 There are 2 records of current Environment Agency/Natural Resources Wales licensed waste sites within 500m of the site. The closest record refers to a Metal Recycling Site at 49 Rivulet Road located 348m east of the site.

**Industrial Land Use Information**

3.37 There are 137 records of potentially contaminative historical land uses identified within 500m of the site. On site records refer to a gas works dated 1882 an industrial estate dated 1992 and unspecified works dated 1964. The closest off-site record refers to unspecified commercial / industrial use, located 1m east of the site, dated 1938. Other records in the vicinity refer to further leather works, a tannery, gas works, railway sidings, tanks, iron and brass foundry, ground workings, unspecified works, breweries, malthouses, flour mills, a smithy, unspecified pits, timber yards refuse heaps, gasometers, and unspecified tanks.

3.38 There are 20 records of current potentially contaminative land uses identified within 250m of the site. The closest record refers to an electricity substation 17m southeast of the site. Other

records in the vicinity refer to business parks and industrial estates, gas and electrical features, petrol stations, vehicle parts, repair and cleaning and accessories and construction and tool hire.

3.39 There are 56 records of historical tanks identified within 500m of the site. There is 1 onsite record which refers to gas works. The closest offsite record refers to a gas holder station located 2m east of the site, dated 1966.

3.40 There are 49 records of historical energy features identified within 500m of the site. There are 2 onsite records which refer to gas works dated 1874 and 1912. The closest offsite record refers to a gas holder station, located 2m east of the site, dated 1966.

3.41 There are 2 records for current petrol or fuel sites within 500m of the site the closest being Texaco fuel station on Kingsmill Road, 168m south of the site.

3.42 There are no records of historical petrol or fuel sites within 500m of the site.

3.43 There are 65 historical garage and motor vehicle repair site records identified within 500m of the site. The closest record refers to a garage located 169m south of the site, dated 1958.

3.44 There are no National Grid high voltage underground electricity transmission cables within 500m of the site.

3.45 There are no National Grid high-pressure gas transmission pipelines within 500m of the site.

3.46 There are 27 historical railway and tunnel features identified within 250m of the site. The closest record refers to railway sidings located 25m northeast of the site, dated 1912.

3.47 There are 3 historical railway lines identified within 250m of the site. The record refers to a historic railway located 53m north of the site.

3.48 There are no current active railway line records identified within 250m of the site.

3.49 There are no underground railway lines or tunnels identified within 250m of the site.

3.50 The site is not within 500m of the route of the High Speed 2 rail project.

3.51 The site is not within 500m of the route of the Crossrail 1 or 2 rail project.

**Environmental Permits, Incidents and Registers**

3.52 The Groundsure Report includes records of environmental permits, incidents, and registers within 500m of the site, which are summarised in Table 1 below.

**Table 1: Environmental Permits, Incidents and Registers within 500m of the Site**

| Permit/Incident/Register | Number |
|---|---|
| Historical Licensed Industrial Activities (IPC) | 0 |
| Part A (1) and IPPC Authorised Activities | 0 |
| Pollutant Release to Surface Waters (Red List) | 0 |
| List 1 Dangerous Substances Inventory Sites | 1 |
| List 2 Dangerous Substances Inventory Sites | 1 |
| Part A (2) and Part B Activities and Enforcements | 1 |
| Category 3 or 4 Radioactive Substance Authorisations | 0 |
| Licensed Discharge Consents | 20 |
| Planning Hazardous Substance Consents and Enforcements | 2 |
| Dangerous or Hazardous (COMAH and NIHHS) Sites | 1 |
| Sites Determined as Contaminated Land under Part 2A EPA 1990 | 0 |
| Regulated Explosive Sites | 0 |
| Pollutant Release to Public Sewer | 0 |
| Substantiated Pollution Incidents (Category 1 and 2) | 4 |
| Pollution Inventory Substances, Wastes and Radioactive Wastes | 0 |

3.53 There is 1 record on List 1 of the Dangerous Substances Inventory Sites within 500m of the site. The closest record is for Sketchley Cleaners for mercury, cadmium and perchloroethylene 349m northwest of the site.

3.54 There is 1 record on List 2 of the Dangerous Substances Inventory Sites within 500m of the site. The closest record is for Sketchley Cleaners for arsenic, chromium, copper, lead, vanadium, and zinc, 349m northwest of the site.

3.55 There is 1 record of Part (2) and Part B Activities and Enforcements within 500m of the site. The closest record refers to Beechley Service Station for a historical Part B permit for unloading petrol into service stations, located 188m South of the site.

3.56 There are 20 records of Licensed Discharge Consents within 500m of the site. The record on site relates to sewage discharge of storm sewer overflow into the adjacent river.

3.57 There are 2 records of Planning Hazardous Substance Consents and Enforcements within 500m of the site. The closest record refers to a historical consent dated 1992 for Wrexham Holder Station, located 68m east of the site.

3.58 There is 1 record of Control of Major Accident Hazards (COMAH) located with 500m of the site. This record refers to a historical NIHHS site for British Gas located 9m east of the site.

3.59 There are 4 records of Substantiated Pollution Incidents within 500m of the site. The closest record refers to an unidentified pollutant located 382m east of the site. This incident dated 2001 had a category 3 (minor) impact on water, land, and air.

3.60 There are no other records of Environmental Permits, Incident or Registers within 500m of the site.

**Environmentally Sensitive Sites**

3.61 There are 2 records of Sites of Special Scientific Interest (SSSI) within 2km of the site. The closest record refers to Sontley Marsh, located 1.6km south of the site.

**Ecology**

3.62 An ecological assessment of the site falls outside the brief of this report. Where considered necessary, advice should be sought from an ecological specialist in this respect.

3.63 However, the site is classified as Urban Land.

**Archaeology**

3.64 An archaeological assessment falls outside the brief of this report. Where considered necessary, advice should be sought from an archaeological specialist in this respect.

3.65 However, there are 12 records of a Listed Building within 250m of the site, the closest being Grade II listed Willow Bridge 10m to the west. Salisbury Park 132m south of the site is recorded as being a conservation area by the local planning authority.

3.66 There are no records of World Heritage Sites, Scheduled Ancient Monuments or Registered Parks and Gardens with 250m of the site.

**Potential Flood Risks**

3.67 Detailed assessment of flood risks is outside the scope of this report. The site lies within an Environment Agency Zone 2 and Zone 3 floodplain.

3.68 The risk of flooding from rivers and sea (RoFRaS) within 50m of the site is considered **high.**

3.69 There are no records of historical flood events within 250m of the site.

3.70 There are no records of flood defences located within 250m of the site.

3.71 There are no records of areas benefitting from flood defences within 250m of the site.

3.72 There are no records of areas used for flood storage within 250m of the site.

3.73 The highest risk of surface water flooding occurring on-site is **1 in 30 years 0.3m – 1 m.**

3.74 The highest risk of groundwater flooding occurring on-site is **low**.

3.75 A Flood Risk Assessment provided by the client suggests that the new unit will have a finished floor level set at a minimum level of 72.67 m AOD, which is the modelled flood level during a 1 in 1,000 AEP event including a 100% blockage to the Rivulet Road culvert.

**Previous Site Investigations**

3.76 A planning application (reference WRC/P/2020/0494) was submitted to Wrexham County Bourgh Council in August 2020 by Mr Howard Fordland for the proposed development of a unit for fitting car tyres and a car wash. The application was refused in regard to the relevant policies in the Wrexham Unitary Development Plan: EC12 development and flood risk, GDP1 Development objectives and T8 Parking.

3.77 The reasons stated:

- The site lies withing a Zone 2 C2 and are at an unacceptable risk of flooding and could potentially give rise to flooding off site.
- The proposed site access onto Salop Road is likely to increase conflicting vehicular movements to the detriment of highway safety

Wrexham council issued recommendations of a contaminated land phased investigation because of the historical use of the site being a leather works and adjacent to a gas works (September 2020).

Wrexham council had concerns regarding the proposed site entrance which would be relocated from Rivulet Road to the corner of Salop and Rivulet Road which was deemed unacceptable and an access on the east side of the site was proposed with consideration given to the nearby water course.

Traffic generation and backing up of traffic due to excessive use of the site was a potential issue along with parking and turning provision.

The possibility that effluent and runoff from vehicle cleaning activities could potentially pollute the nearby water course and groundwater was a potential issue with the plans along with noise generation, dust management, and burning or waste relating to construction activities

3.78 A planning application (reference WRC/P/2016/0494) was submitted to Wrexham County Bourgh Council in April 2016 relating to the intended demolition of the Wrexham Theatre. A bat survey was carried out and non were found but the presence of Japanese knotweed was noted on the riverbank. The Musical Theatre was a brick building with a steel and timber roof. (See Figure 5 Overleaf)

3.79 A planning application (reference P/2000/0494) was submitted in May 2000 for the continuation of hazardous substances consent in part of the site. No further details are available.

**Figure 5 Musical Theatre Demolished in 2016**

**1. Front and side elevation**



**2. Front elevation**



## 4.0 SITE HISTORY

4.1 The historical development of the site has been determined by reference historical plans and Google Earth imagery. The reviewed historical plans comprise only readily available records and may be limited; however, the information available to date indicates that additional searches are unlikely to add to our understanding of the site. The earliest available historical mapping covering the site dates to 1873.

4.2 The site history is summarised in Table 2, below, followed by selected extracts from maps and aerial photographs.

**Table 2: Summary of Site History**

| Date | On-Site History | Surrounding Land Use History |
|---|---|---|
| 1873<br>1:2,500 | The site has ten small buildings associated with it and a pump site.<br>A river Afon Gwenfro runs along the east and south of the site flowing east.<br>There are several trees on site. | There is a gas works to the east of the site, beyond which and to the north is open land to the river.<br>There is a tannery on the north side of the river and residential terrace housing to the south of the site along Salop Road.<br>On the west side of Salop Road, there are two breweries with malthouses<br>To the south of the gas works are a series of treelined rectangular fields, possibly orchards. |
| 1874<br>1:500 | The site has several small residential buildings and trees, now identified as Havelock Square | No significant change other than a spring is identified to the south of the site, south of the river, behind a residential building on Salop Road. |
| 1899<br>1:2,500 | The site remains the same other than a well being marked in the northwest corner. | The railway line extends west-east along the previous trajectory of Mount Road.<br>Rivulet Road has now been constructed north of the site and the tannery to the north side of the river has expanded and includes Cambrian Leather Works.<br>There is a large “horse repository” (urban horse dealership) north of the railway line<br>The residential housing has expanded to the south of the site to include terraces along Greenbank Street and Wrexham Pechan.<br>There are breweries and malthouses on the west side of Salop Road<br>The river is now culverted beneath the tannery.<br>A school and congregational chapel have been constructed 250m to the southwest of the site near Madeira Hill and Salisbury Road. |

| Date | On-Site History | Surrounding Land Use History |
|---|---|---|
| 1912<br>1:2,500 | No significant change. | The larger brewery on the west side of Salop Road is now a tram depot belonging to the Wrexham corporation along with "electricity works" and public baths<br>There is an additional tank at the gas works to the east of the site.<br>There are chimneys noted on the maps at the gas works and tanneries<br>Trees are no depicted in the open area south of the breweries on the west side of Salop Road.<br>Terraced housing of Birch Street has been constructed 150m south of the site.<br>Detached houses with large gardens are built along Salisbury Road. |
| 1937<br>1:2,500 | No significant change | Residential buildings on the west side of Salop Road, opposite the site have been demolished.<br>There is a Public House on the previous brewery site at the junction of Willow and Salop roads.<br>200m to the west there is the Eagle iron and brass foundry |
| 1958<br>1:1250<br>1958-1960<br>1:1250 | Residential buildings on the site have been demolished and a "Works" consisting of 6 buildings along the west and north sides of the site, facing Salop and Rivulet roads respectively. | A tennis court and bowling green appear on the map opposite Birch Street and Salop Road, 100m south of the site. |
| 1966-1971<br>1:1250 | The site is now part of the Cambrian Leather Works and an additional building has been on the southern boundary. | The tannery site is now all listed as Cambrian Leather works. Which lies in the north side of Rivulet Road, opposite the site. Three of the tanks at the former gasworks have been demolished and replaced with one large tank and labelled a "gas holder station"<br>There is a road haulage depot 75m southwest of the site, opposite the terraced houses on Salop Road.<br>Willow Bridge over the River Gwenfro is mentioned at the junction of Salop and Willow roads. |
| 1973 – 1975<br>1:1250 | No significant change | A large supermarket and car park has been built on the site of the former horse repository and Eagle Fields Meadow |
| 1975-1978<br>1:1250 | The buildings located on the north side of the site facing Rivulet Road have been demolished. | No significant change |

| | | |
|---|---|---|
| 1988 - 1990<br>1:1250 | The buildings remain the same however the site is not listed as part of the leather works. | The Cambrian leather works have now become the "Cambrian Industrial Estate.<br>The railway line has been dismantled and houses have been constructed above its embankment to the north.<br>Many of the buildings opposite the site have been demolished along with buildings related to the previous road haulage depot on the west side of Salop Road. |
| 1990 – 1992<br>1:2,500<br>1990 – 1994<br>1:1250 | The buildings on the site have been demolished and replaced with one large building on the southwest corner near to the river and a smaller construction on the corner at the junction of Salop and Rivulet Roads. | A sawmill exists to the east of the Cambrian Industrial Estate<br>The building to the south of the river next to the site has been demolished<br>Buildings opposite the site on Salop Road have been demolished and replaced with large steel framed retail buildings. |
| 2003<br>1:2,500 | No significant change. | No significant change |
| 2006<br>Google Earth | No significant change. | The area of Eagles Meadow carpark and the supermarket 150m north of the site, have been demolished and prepared for building. |
| 2007- 2009<br>Google Earth | The site has one large building (the Wrexham Musical Theatre on its southwest corner, the remainder is tarmac car park. | The Gasometer has been demolished and the former gasworks site is now derelict<br>A Lidl Supermarket has been built on the site of the former depot, southwest of the site on Salop Road.<br>Steel framed plumbing retail outlets have been built on part of the site of the former gasworks.<br>The area of Eagles Meadow is now a large shopping complex. |
| 2016<br>Google Earth | The theatre on the site has been demolished and the site is vacant with hard standing. | Residential housing has been constructed on the former gasworks site (Willow Bridge Crescent and Cefn-y-Nant) as well as the large oval building opposite the junction of St Giles way and Salop Road to the south of the site. |
| 2021<br>Google Earth | The site is vacant with tarmac over most of the site with vegetation regenerating in the former theatre. | No significant change |

**Figure 6 OS Map Extract 1873**

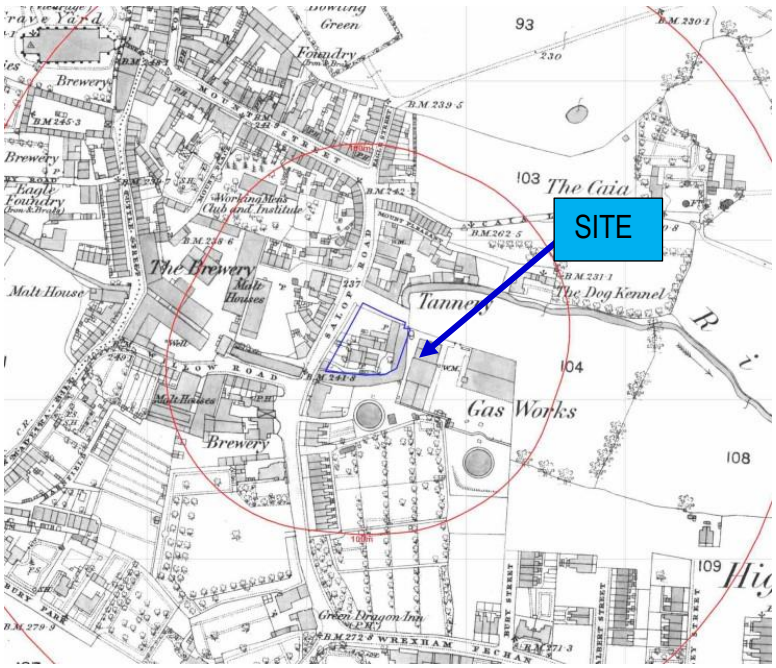



**Figure 7 OS Map Extract 1899**

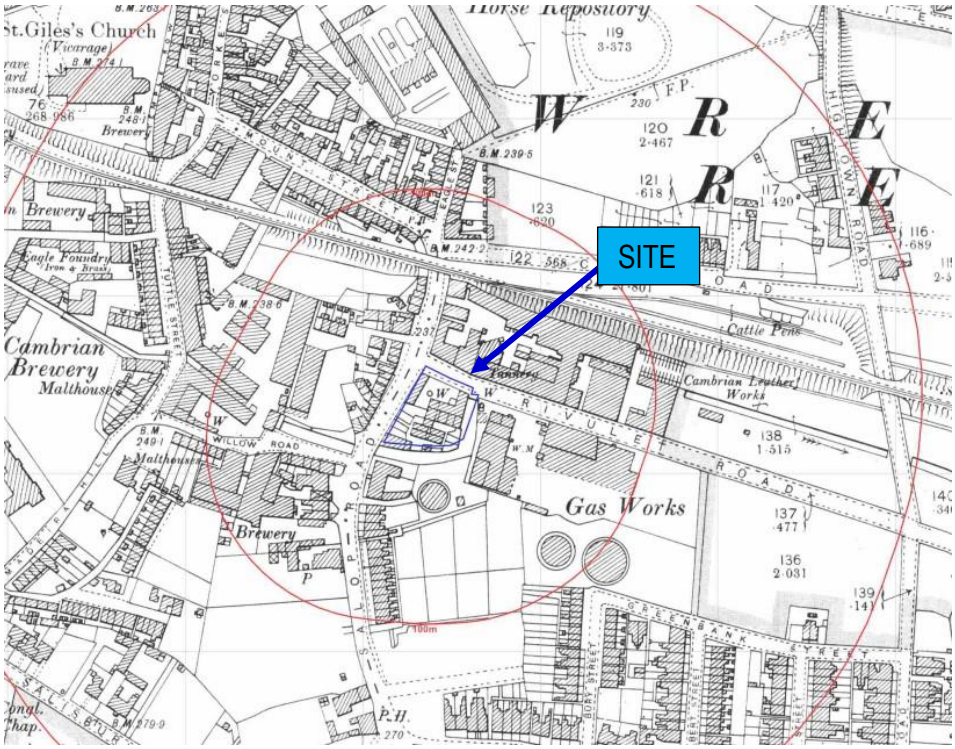


**Figure 8 OS Map Extract 1958**

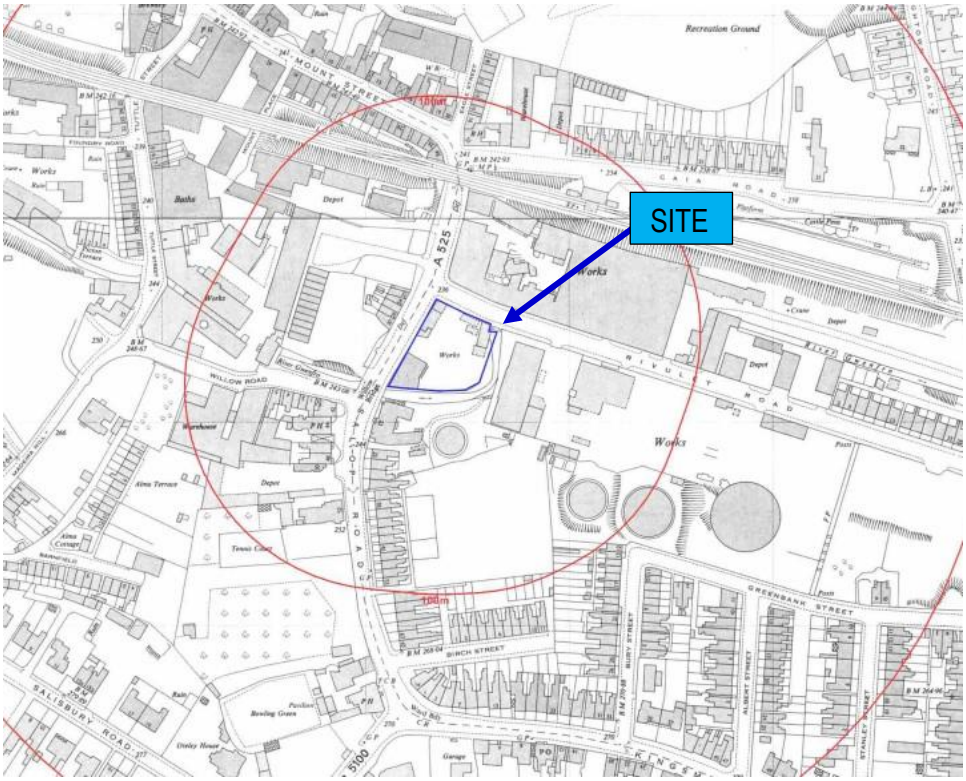



**Figure 9 OS Map Extract 1990-92**

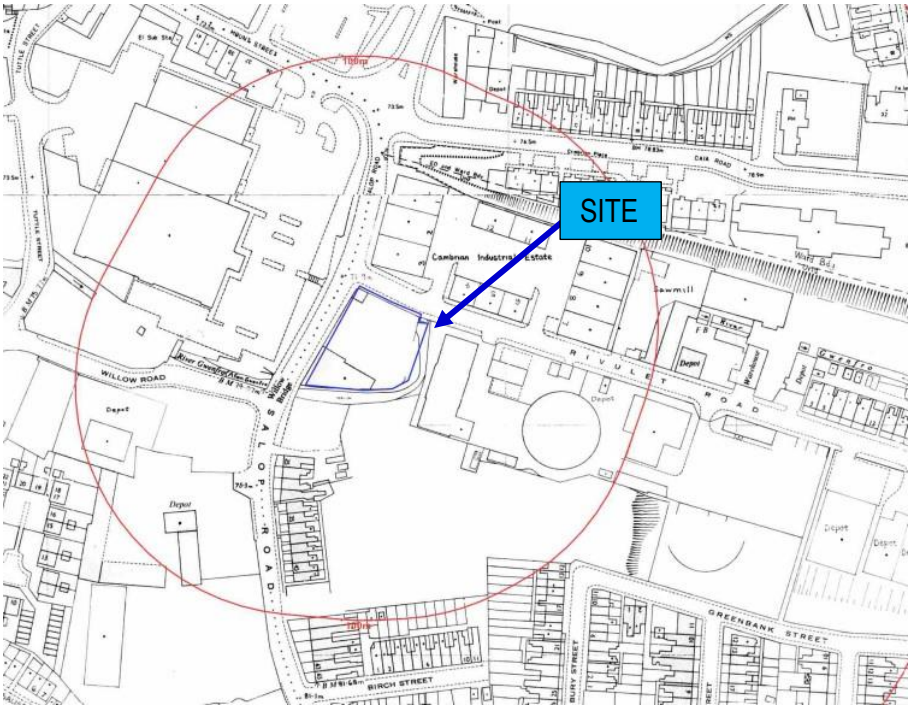


**Figure 10 Aerial Photograph 2021**



## 5.0 WALKOVER SURVEY

5.1 A walkover survey was completed on 16th November 2021. The photographs and notes from this survey are appended to this report as Appendix 2 and Appendix 3 respectively.

5.2 The site is currently accessed via a double gate on Rivulet Road to the north of the site.

5.3 The site is currently vacant land, surrounded by a brick wall and has a 3m wide river/stream on its south and east sides running north.

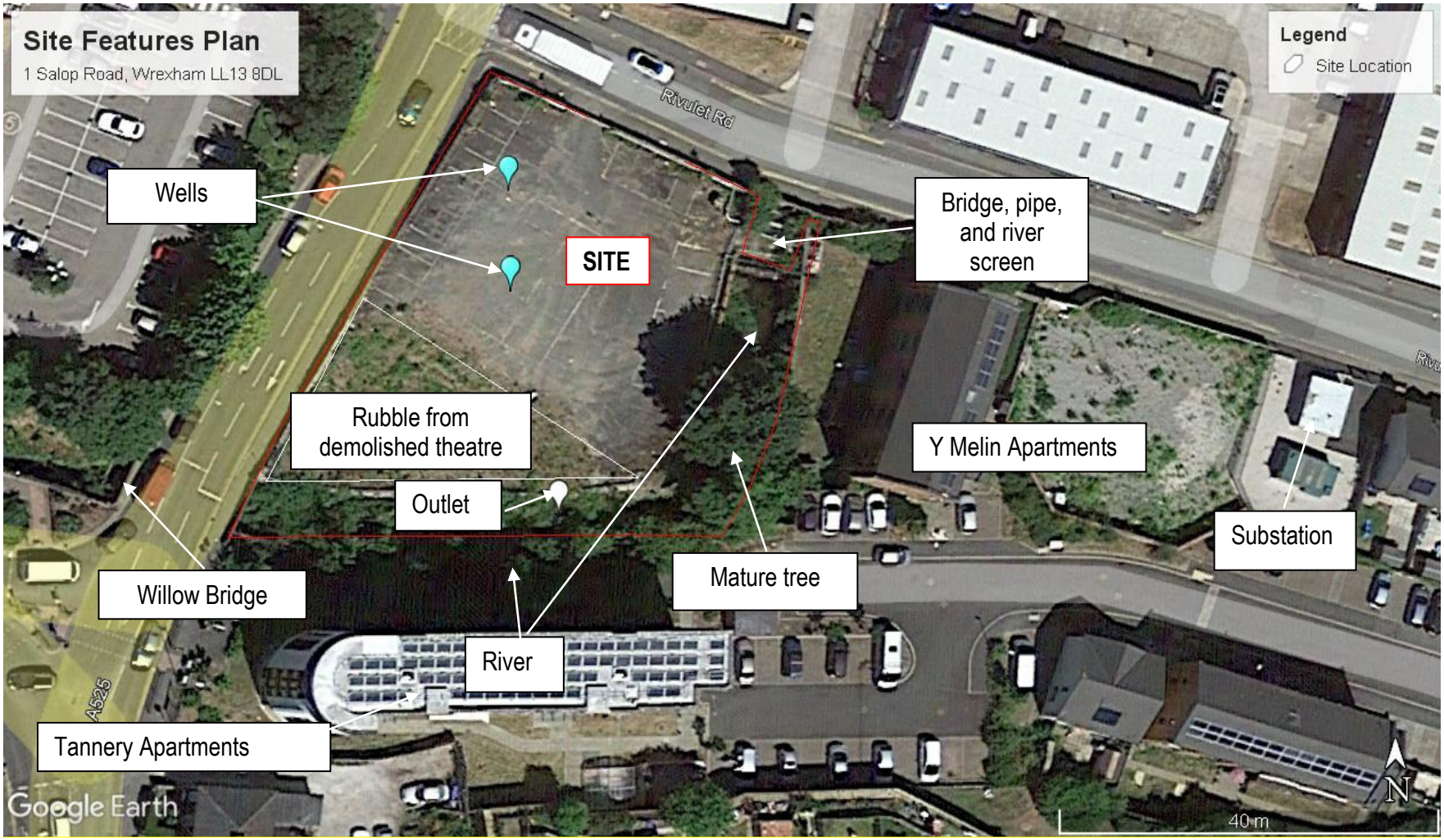
5.4 The site is flat and is all made ground with 75 % being asphalt and the remaining 25% being rubble from the demolished theatre. There are some low shrubs and one large sycamore tree.

5.5 The site has services to it: drains, a power cable, two wells and a wastewater outlet (draining into the river) were noted.

5.6 The site is surrounded by a mix of residential terraces, apartment buildings and light industrial / retail units and next to a busy junction. There is a grade II listed bridge adjoining the site.

5.7 A site features plan is presented as Figure 11 overleaf.

**Figure 11 Site Features Plan**



## 6.0 PRELIMINARY CONTAMINATION RISK ASSESSMENT

### Introduction

6.1 The following paragraphs outline a Preliminary Risk Assessment (PRA) for the site based on the above desk study information as defined by DEFRA and the EA Model Procedures for the Management of Land Contamination, CLR11(2004).

6.2 Table 5 provides a Preliminary Conceptual Model (PCM) which considers the source-pathway-receptor linkages present alongside the likelihood, severity and risk level as defined within Table 3 and Table 4 below. The assessment of probability, a modified risk table, and certain consequence definitions are based on CIRIA C552 and CLR11.

6.3 Table 5 considers whether a pollution linkage is potentially present and provides a preliminary qualitative assessment of risk based on the information currently available. Where a possible linkage is identified, it does not necessarily mean that a significant risk exists but indicates that further information is required through appropriate site investigation to substantiate the conceptual model.

6.4 The PCM/PRA is based on a proposed commercial end use.

**Table 3: Consequence, Probability and Risk**

| Probability | Consequence, | Risk |
|---|---|---|
| High Likelihood- There is a pollution linkage and an event either appears very likely in the short term and almost inevitable over the long term, or there is evidence at the receptor of harm or pollution | Very High – acute risk to the human health likely to result in significant harm. Risk of severe or irreversible effect on ground/surface water quality. Catastrophic damage to buildings / property. | Very High – there is a high potential that the source-pathway-receptor scenarios may give rise to harm to human health, or the environment and remedial action is likely to be required. |
| Likely – there is a pollution linkage, and all the elements are present, which means that it is probable an event will occur. Circumstances are such that an event is not inevitable, but possible in the short term and likely over the long term. | High – Severe or irreversible effect on human health. Temporary severe or irreversible effect on ground/surface water quality. Reduction of water quality rendering groundwater or surface water unfit to drink and/or substantial adverse impact on groundwater dependant environmental receptors. | High – it is likely that the source-pathway-receptor scenarios may give rise to an impact on human health or the environment, which may require remediation and/or control measures to mitigate risks |
| Low likelihood– there is a pollutant linkage and circumstances are possible for an event could occur. However, it is by no means certain that even over a longer period such event would take place, and is less likely in the shorter term | Moderate – Long term or short-term moderate effect on human health. Moderate effect on ground/surface water quality, reversible with time. Reduced reliability of a supply at a groundwater or surface water abstraction source | Moderate – it is possible that the source-pathway-receptor scenarios may give rise to an impact on human health or the environment, however it is either relatively unlikely that such would be severe, or if any harm were to occur it is more likely that harm would be mild. |
| Unlikely – there is a pollution linkage, but circumstances are such that it is doubtful that an event would occur even in the very long term. | Low – Non-permanent health effects to human health (easily prevented by means such as personal protective clothing etc.) Slight effect on ground/surface water quality, reversible with time. Marginal reduced reliability of a supply at a groundwater or surface water abstraction source. | Low – it is possible that harm could arise at the source, however it is likely that this would at worst be mild. |
| | | Very Low – it is unlikely that the source-pathway-receptor scenarios will give rise to an impact on human health or the environment. |

**Table 4: Estimation of Level of Risk by Comparison of Consequence and Probability**

| | | Consequence | | | |
|---|---|---|---|---|---|
| | | **High** | **Moderate** | **Low** | **Very low** |
| **Probability** | **High Likelihood** | Very High | High risk | Moderate risk | Moderate to low risk |
| | **Likely** | High risk | Moderate risk | Moderate to low risk | Low risk |
| | **Low Likelihood** | Moderate risk | Moderate to low risk | Low risk | Very low risk |
| | **Unlikely** | Moderate to low risk | Low risk | Very low risk | Very low risk |

### Potential Sources

6.5 Historically the site has been a series of residential buildings until the 1800s (Havelock Square) and then became part of the tannery and Cambrian Leather Works in the 1950s. In the 1990s there was a Musical Theatre on the site which was demolished in 2016.

6.6 Potential on-site sources of contamination include chemicals and heavy metals (Arsenic and Chromium) associated to the tanning process. Hazardous materials stored at the site for which there was a continuation of a licence applied for in May 2000. The presence of a historic gasworks adjacent to the east of the site suggests soil has the potential to harbour toxic waste such as hydrocarbon sludge, tar and spent oxide waste. Other potential sources of contamination (e.g., Asbestos) may be associated with the development and demolition of onsite buildings and surface ground workings.

6.7 Potential off-site sources of contamination include a gas works located immediately to the east of the site, ground gas associated with offsite developments, surface ground workings associated with the tanneries, foundries, railway sidings, timber yards, mills, and breweries in the area.

6.8 There is potential for the presence of contamination associated with the following:

- Areas of Made Ground from on and off-site developments
- Ground gas associated with Made Ground
- Leaks and spillages of fuels and oils associated with on site development.

6.9 Contaminants may therefore include heavy metals, hydrocarbons, asbestos, and ground gases (Carbon dioxide, methane.)

### Potential Receptors

6.10 The following receptors have been considered for the construction and operational stages of the proposed redevelopment.

- Current site users;
- Adjacent land users;
- Future land users;
- Construction workers during site development works;
- Surface water and Groundwater within the underlying aquifer

### Potential Pathways

6.11 The following pathways have been considered for the construction and operational stages of the proposed redevelopment.

- Dermal contact, ingestion, inhalation pathways of potentially contaminated soils.
- Downward vertical migration of leachate to surface waters and shallow groundwater.
- Vertical or lateral migration of ground gas.

**Table 5: Preliminary Conceptual Model**

| Source | Pathway | Receptor | Probability | Consequence | Risk | Comment |
|---|---|---|---|---|---|---|
| Potential soil contamination<br><br>E.g., Heavy Metals, PAH, TPH, BTEX and ground gases. | Dermal contact, ingestion, and inhalation of soils dust | Current Site Users | Unlikely | Moderate | Low | The site is currently a vacant lot of asphalt and rubble. The risk is therefore considered to be **LOW**. |
| | | Adjacent land users | Unlikely | Moderate | Low | Residential properties overlook the site on the southern and eastern boundaries. There are also footpaths adjacent to the site on the western and northern sides. Usual dust control measures should be implemented as part of good site working practices during construction to reduce dust generation. Therefore, the risk is considered **LOW.** |
| | | Future land users | Low Likelihood | Moderate | Moderate to Low | The proposed development consists of constructing a carwash and tyre fitting / car maintenance centre. Some of the site will be surfaced in hardstanding. The risk to future site users via direct exposure is **MODERATE.** This assessment is based on the potential for contamination to be present beneath the site. |
| | | Construction Workers | Low Likelihood | Moderate | Moderate to Low | Construction workers may be exposed to potentially contaminated soils during construction works, however exposure duration will be short-term only. The risk to construction workers is considered **MODERATE.** Appropriate health and safety measures (in line with CDM and other relevant health and safety guidance) will reduce the risk to **LOW.** |

| Source | Pathway | Receptor | Probability | Consequence | Risk | Comment |
|---|---|---|---|---|---|---|
| | Downward vertical migration of leachate to shallow groundwater | Groundwater within the Underlying Aquifer | Low Likelihood | Moderate | Low | The underlying superficial soils are anticipated to be sand and gravel with intergranular flow high permeability. There are 4 abstraction licences within 2km. The groundwater vulnerability and soil leaching are high however most of the site will be covered with asphalt. The risk to groundwater is therefore considered **LOW.** |
| | Lateral migration in surface waters | Surface water | High Likelihood | Moderate | High Risk | There is a river that is located on along the southern and eastern boundaries of the site. Run off from car washing activities is likely and the drain overflow runs into the river. Therefore, the perceived risk to surface waters is **HIGH.** |
| | Vertical or lateral migration of ground gas | Current Site Users | Likely | Moderate | Moderate | The site is currently vacant and much of the area is anticipated to be of made ground. It is within a radon affected area with 5-10% of properties being affected. A historical gas works was located within 1m east of the site This risk to current site users is therefore **MODERATE.** |
| | | Adjacent land users | Low Likelihood | Moderate | Moderate to Low | Residential properties predominantly surround the site as well as light industrial units and public walkways. Areas of Made Ground are anticipated. There is moderate potential for radon gas and basic radon protection measures are required. The risk to adjacent site users from ground gas is therefore considered **MODERATE TO LOW.** |
| | | Future land users | Low Likelihood | Moderate | Moderate | The proposed development consists of constructing car wash and car maintenance unit. There is moderate potential for radon gas and basic radon protection measures should be implemented, therefore the risk is considered **MODERATE** |
| | | Construction Workers | Low Likelihood | Moderate | Moderate to Low | Construction workers may be exposed to ground gas; however, the duration will be short term and the anticipated construction is not likely to take an extended amount of time. The risk to construction workers from ground gas is considered **MODERATE TO LOW.** |
| Asbestos Containing Material (ACM) | | Current Site Users | Unlikely | Moderate | Low | The site is currently vacant with rubble in the southwest 1/3 of the site. Asbestos may be present on the site associated with the construction and demolition of onsite buildings. Asbestos is only harmful when disturbed. The risk to current site users is **LOW.** |
| | | Adjacent land users | Unlikely | Moderate | Low | Residential properties, light industrial units and public walkways surround the site with Asbestos may be present on the site. Disturbance of soil during the construction phase may allow fibres to become airborne. Dust control measures |

| Source | Pathway | Receptor | Probability | Consequence | Risk | Comment |
|---|---|---|---|---|---|---|
| | | | | | | (dampening down) should be implemented as part of good site working practices. Therefore, the risk is considered **LOW**. |
| | | Future land users | Low Likelihood | Moderate | Moderate to Low | The proposed development consists of constructing car wash and car maintenance unit. Much of the site will be surfaced in hardstanding. The risk is therefore considered **MODERATE TO LOW.** A contamination assessment of the existing on-site soils would be required to determine the level of risk and necessary mitigation measures. |
| | | Construction Workers | Low Likelihood | Moderate | Moderate to Low | Construction workers may be exposed to potential asbestos in Made Ground soils. However, this potential area is small. The risk is considered **MODERATE TO LOW.** A contamination assessment of the existing on-site soils would be required to determine the level of risk and necessary mitigation measures. |

## 7.0 GEOTECHNICAL HAZARDS ASSOCIATED WITH THE DEVELOPMENT

7.1 In addition to the environmental hazards there are also geotechnical hazards associated with the stability of the ground including load bearing capacity, slope stability and effects of ground mining activities. Local Authorities follow NPPF (2012) which requires that a site is suitable for its new use considering of ground conditions and land instability, including from natural hazards to former activities such as mining. A summary of the geotechnical considerations is provided below in Table 6.

**Table 6: Summary of Geotechnical Hazards**

| **Geohazards:** | |
|---|---|
| Highly Compressible Ground | Low risk |
| Collapsible Soils | Low risk |
| Swelling Clay | Low risk |
| Running Sand | Low risk |
| Ground Dissolution | Negligible risk. |
| Landslip | Negligible risk |
| Mining & Quarrying | The site is located within a Coal Mining Reporting Area but not within a Development High Risk Area. There are no mining activities reported on site. Therefore, the mining risk is considered very low. |
| **Geotechnical Design Considerations** | |
| Site Clearance | The site is generally vacant therefore very little site clearance will be necessary. However, there is a patch of rubble in the southeastern third of the site, which if found to contain asbestos would need remedial treatment. There is also a moderate amount of rubbish and a large steel crash barrier which may require removal. |
| Trees | There is only one mature tree on site on the banks of the river on the eastern side. |
| Existing Buildings/Obstructions | There are no buildings located on the site. |
| Foundations | The depth and type of proposed foundations would depend on the ground conditions present on site. There are artificial deposits of made ground present across most of the development plot and the superficial geology is potentially weak alluvium. |

| Geotechnical Design Considerations | |
|---|---|
| Floor Slabs | Again, an intrusive geotechnical investigation is recommended prior to any construction works to discover the most suitable floor slab design for the on-site ground conditions. |
| Groundwater | Exact groundwater conditions are not known at this stage. For more detailed knowledge of the groundwater regime, an intrusive geotechnical investigation would be needed. However, it is recorded that the site is underlain by Secondary A aquifers. The highest risk of groundwater flooding on site is recorded as low. There are two wells located on site. |
| Earthworks | The site lies relatively flat on the proposed development area and has brick walls around the perimeter. There is a concrete bund on the south side of the site above the bank of the river which slope 2 metres to the riverbed. Due to the site construction being intended to be dismantlable and taking up a relatively small proportion of the site, earthworks are not anticipated. |
| Slopes | The site has slopes on the riverbanks on the southern and eastern sides. A drop of approximately 2 m maximum exists between the site and the riverbed. |
| Retaining Walls | There is an approximately 2m brick retaining wall in the northeast corner of the site adjacent to the access bridge and river grill. |
| Chemically aggressive ground conditions | Chemically aggressive ground conditions are not expected at this site. However, an intrusive geotechnical investigation would be necessary to confirm this. |

## 8.0 CONCLUSIONS & RECOMMENDATIONS

### Conclusions

8.1 The proposed development of the site is the construction of a carwash, car maintenance unit and secure lockup.

8.2 Historically the site was depicted on maps dating from 1873 as a of a cluster of residences (Havelock Yard) until the 1950s when the site became part of the Cambrian Leather Works. It is immediately adjacent to an historical gasworks site (pre-1872-1990's).

8.3 Potential on-site sources of contamination include toxic chemicals and heavy metals (Arsenic and Cadmium) resulting from the historical tanning industry. Contaminants associated with the disposal of waste from the adjacent gasworks site. Ground gas and asbestos associated with the development and demolition of onsite buildings are possible. More recently, a licence to store hazardous waste at the site was reapplied for in May 2000.

8.4 Potential off-site sources of contamination include a historical gas works located 1m east of the and historical tanneries, timberyards, foundries, gasometers, tanks, and breweries within 500m of the site.

8.5 The site is underlain by made ground, below which are alluvial deposits, comprising of sand and gravel (Secondary A Aquifer) and clay. The solid geology comprises of Mudstones, sandstones, and conglomerates of the Salop Formation: (Secondary A Aquifer).

8.6 The site is in a Radon Affected Area, with 5%-10% of the properties above the Action Level and basic radon protection measures should be implemented.

8.7 Given the potential contaminative land uses, the overall risk from soil contamination to end users and construction workers is concluded to be **MODERATE - LOW.**

8.8 The risk to controlled waters (aquifers and rivers) is concluded to be **HIGH** based on the permeable soil properties, current drainage conditions and wells on site and the nature of the activities intended for the site.

8.9 The risk from ground gas to end users and construction workers is **MODERATE-LOW** given the anticipated extent of Made Ground and potential presence of gas from historical leatherworks / tanneries and the historical gas works located within the vicinity of the site.

8.10 The risk from asbestos to end users and construction workers is **MODERATE-LOW** given that there are no buildings on site and the residual rubble from the theatre demolition did not visually appear to have asbestos waste present. Also, the anticipated exposure during the construction process will be limited and that most of the site will be hardstanding.

8.11 The site is located within a Zone 2 and Zone 3 floodplain and the risk of surface water flooding is **HIGH** (1 in 30 years 0.3-1m). The risk of groundwater flooding is **LOW**.

## Recommendations

8.12 The proposed new unit will be a lightweight portal framed building that will be founded on shallow foundations. Therefore, there will be little interference or disturbance of ground conditions.

8.13 Radon protection measured will be introduced into the foundations of any new structures.

8.14 If any potential contamination is found during construction activities, it should be characterised by chemical testing and either removed offsite (to an appropriate disposal facility) or retained on site.

# APPENDIX 1

# GROUNDSURE REPORTS

# APPENDIX 2

# SITE PHOTOGRAPHS

<table>
<tr><td>Earth Environmental & Geotechnical Ltd<br><br>Tel: 0161 975 6088<br>Email: info@earthenvironmental.co.uk<br>Web: www.earthenvironmental.co.uk</td><td>SITE PHOTOGRAPHS<br><br>EARTH ENVIRONMENTAL & GEOTECHNICAL</td></tr>
<tr><td>Job No.: A4428/21</td><td>Site: 1 Salop Road, Wrexham d</td></tr>
<tr><td>Plate 1 Viewing south from the entrance towards the tannery housing association apartments</td><td>Plate 2 Viewing east from site entrance showing Y Melin apartments. And gate onto access bridge for river grill. And crash barrier.</td></tr>
<tr><td></td><td></td></tr>
<tr><td>Date: 16th November 2021</td><td>Date: 16th November 2021</td></tr>
<tr><td>Plate 3 Viewing north showing the access gate from Rivulet Road and industrial estate opposite</td><td>Plate 4 Viewing northwest showing the boundary along Salop Road with low vegetation and brick walls.</td></tr>
<tr><td>
</td><td></td></tr>
<tr><td>Date: 16th November 2021</td><td>Date: 16th November 2021</td></tr>
</table>

<table>
<tr><td>Earth Environmental & Geotechnical Ltd<br><br>Tel: 0161 975 6088<br>Email: info@earthenvironmental.co.uk<br>Web: www.earthenvironmental.co.uk</td><td>SITE PHOTOGRAPHS<br><br>EARTH ENVIRONMENTAL & GEOTECHNICAL</td></tr>
<tr><td>Job No.: A4428/21</td><td>Site: 1 Salop Road, Wrexham</td></tr>
<tr><td>Plate 5 Viewing east showing the river, grill, and flood measure along with plastic contamination.</td><td>Plate 6 Viewing south showing the retaining wall and the drain outlet with contamination</td></tr>
<tr><td></td><td></td></tr>
<tr><td>Date: 16th November 2021</td><td>Date: 16th November 2021</td></tr>
<tr><td>Plate 7 Viewing southeast showing. the mature tree, apartment building and area of rubble in the south of the site.</td><td>Plate 8 Rubble material in the southwest of the site.</td></tr>
<tr><td></td><td></td></tr>
<tr><td>Date: 16th November 2021</td><td>Date: 16th November 2021</td></tr>
</table>

**Figure 12 Site Walkover Photo Locations**



# APPENDIX 3

# SITE WALKOVER NOTES

EARTH ENVIRONMENTAL & GEOTECHNICAL

## WALK OVER SURVEY REPORT

**Site:** 1 Salop Road, Wrexham **Date:** 16th November 2021

**Job No:** A4428/21 **Undertaken By:** Heidi Richards

**Purpose of Site Walkover:**
1) Provide further information for the Desk Study Report;
2) Identify potential contamination sources, pathways, and receptors.
3) Identify geotechnical features and potential geohazards.
4) Determine locations for exploratory boreholes.

| Desk Study features checked during site visit | Feature and Information required | Present | Description / Comments |
|---|---|---|---|
| Site Setting | Description required for:<br><br>Town/Country/Suburb Setting<br><br>Industrial/Residential/Retail Usage<br><br>Current Site use (if undertaking security and access to the site) | | <br><br>Urban setting.<br><br>Surrounding areas is a mix of late 19th C brick terrace housing, modern blocks of flats and retail and light industrial brick and steel units.<br><br>The site is currently a vacant lot |
| Evidence of Past Activities | Are there:<br><br>Any relevant street names in area?<br><br>Features or relics which indicate past history? | <br><br>Yes/~~No~~<br><br>Yes/~~No~~ | The site is located on a corner of Salop and Rivulet Roads.<br>To the east of Salop Road (A525) and to the south of Rivulet Road<br>There is a busy intersection near the southwest corner of the site between Salop Road and St Giles Way.<br>The flats to the south of the site are called the Tannery and there is a plaque on Willow Bridge dedicated by Willow Brewery. |
| Geographic Setting | Description required for:<br>Low lying flood plain/dry valley/rolling hills etc. | | The site is located within a depression and on the banks of the River (Afon Gwenfro) which at this point is a gently flowing stream approximately 3 m wide and 40-50 cm deep<br><br>The banks of the stream have small bushes and saplings.<br><br>Wrexham urban centre is one of rolling hills |
| Ground Conditions | Is there any evidence of:<br><br>Mining, Mine entries<br><br>Subsidence<br><br>Landslip/slope erosion<br><br>Former investigation works | <br><br>~~Yes~~/No<br><br>~~Yes~~/No<br><br>~~Yes~~/No<br><br>~~Yes~~/No | There is no evidence of land slip, and the banks of the river are retained within brick walls or gently sloping |

| **Desk Study features checked during site visit** | **Feature and Information required** | **Present** | **Description / Comments** |
|---|---|---|---|
| Topography | Description required for:<br><br>Are there apparent differences between site and surrounding area? (If yes describe the presence of retaining walls, and slopes).<br><br>Is there evidence of Made Ground / Fill on site? | Yes/~~No~~<br><br>Yes/No | The site is surrounded by brick walls ranging from 0.6 – 1.5 m apart from a small area on the banks of the river to the south of the site where a low (40 cm) concrete bund is present<br><br>There is an asphalt carpark occupying the northern 2/3rds of the side and the remaining area is rubble (from the demolished theatre?) and vegetation |
| Site Boundaries and Neighbours | Description required for:<br><br>Type of boundary demarcation (if any) on each side of site, usage of adjacent land and name of industrial/commercial occupiers.<br><br>Note any adjacent features such as water course and other potentially environmentally sensitive uses (residential, school, infirmary, SSSI etc) | | The site is demarcated by brick walls ranging from 0.5 m to 1.5 m on the north, west and eastern sides. In the south partially enclosed in brick wall and cut stone wall in the southwest corner where it joins with the grade II listed Willow Bridge. In the southeast corner of the site is a low concrete bund on the banks of the river.<br><br>A block of housing association flats (Y Melin and the Tannery) overlooks the site and housing association houses are adjacent on Rivulet Street. |
| Vegetation | Are there any vegetation/trees on or close to site (if yes describe locations, type, maturity, etc)<br><br>Is there any evidence of poor health / distress? | Yes/~~No~~<br><br>~~Yes~~/No | Buddleia bushes and birch saplings occupy the rubble area in the southwest of the site and around the edges. A large sycamore (approx. 12 m) is present on the banks of the river in the southeast corner of the site.<br><br>N/A |
| Ground Surface | Are there areas of hardstanding and estimate the split between hard and soft cover? (If yes describe locations, types, and conditions).<br><br>Is there any evidence of any spillages or staining? | Yes/~~No~~<br><br>~~Yes/~~No | 75 % of the site is covered by asphalt carpark the remaining 25% is 10-20 cm of rubble consisting of broken concrete, brick, glass, wood, and metal fragments.<br><br>Nonvisible on the site walkover. |

| Desk Study features checked during site visit | Feature and Information required | Present | Description / Comments |
|---|---|---|---|
| Site Drainage | Are there any drain covers / soakaways (if yes describe locations)<br><br>Are there any outfalls/water courses on site (note the condition of water courses in open water courses. discolouration, odour, eutrophication, oily sheen, gas bubbling water, clear or cloudy)<br><br>Where a watercourse runs alongside or crosses a site are there any differences in visible water quality upstream and downstream of the site? | Yes/~~No~~<br><br>Yes/~~No~~<br><br>Yes/~~No~~ | There is a drain cover approx.11 meters from the north boundary (Rivulet Road) and 9 meters from the west boundary (Salop Road side) of the site<br><br>There is an out fall pipe / drain entering the river on the east side of the site where there is a footbridge / access to a flood measure and a grill to catch leaves and rubbish.<br>There is also a disused plastic outlet into the river at the south end of the site.<br><br>The river Afon Gwenfro runs alongside the south and east boundaries of the site towards the north and enters a culvert near the north eastern corner of the site. The drain here is depositing orange iron-stained water into the river. There is a moderate amount of plastic waste in the stream however a trout was observed |
| Electrical Equipment | Are there any electricity sub stations on or adjacent to the site? Are there any electrical transformers, capacitors, pylons etc on site? | Yes/~~No~~ | A grey cable was noted on the south side of the site, exiting near the stream, and buried in rubbish in the carpark area. Possibly an electric cable.<br><br>There is a substation 50 m from the site on Rivulet Road |
| Buildings | Is there any evidence of asbestos construction materials e.g., roofing, insulation materials.<br><br>Do any buildings have basements?<br><br>Do any buildings have a boiler room (if yes, describe fuel type and storage arrangements)? | ~~Yes/~~No<br><br>~~Yes~~/No<br><br>~~Yes~~/No | No buildings located on site. However, there was a theatre which has been demolished and could have contained asbestos. |

| Desk Study features checked during site visit | Feature and Information required | Present | Description / Comments |
|---|---|---|---|
| Landfilling | Is there any evidence of gas protection measures (gas membrane, gravel-filled trenches, venting pipes, etc)? | ~~Yes~~/No | N/A |
| Process Air Emissions | Point Source: Are there any stacks / vents / cooling towers / abatement equipment?<br><br>Fugitive Source: is there any stockpiled material / windblown dust / vapour process? | ~~Yes~~/No<br><br>~~Yes~~/No | N/A |
| Storage of fuels & Chemicals | Are there any drums / containers (if yes, describe quantity, full /empty, stored on hard standing / soft landscaping, bunding)?<br><br>Are there any above ground fuel tanks (if yes, describe locations, volumes, how many, bunding, used / disused, condition?)<br><br>Is there any evidence of underground fuel tanks (fuel pumps, covers, vent pipes, how many and how large, fill point, used / disused, and condition)? | ~~Yes~~/No<br><br>~~Yes~~/No<br><br>~~Yes/~~No | N/A<br><br>N/A<br><br>N/A |
| Accidents | In the event of a large spillage would runoff affect any vulnerable watercourse/culverts?<br><br>Are emergency procedures / equipment in place? | ~~Yes/No~~<br><br>~~Yes/~~No | Any spillage would likely enter the river through drains at the site which appear to drain directly into the river. |

| **Desk Study features checked during site visit** | **Feature and Information required** | **Present** | **Description / Comments** |
|---|---|---|---|
| Waste | Are there any waste skips present on site?<br><br>Are waste storage facilities adequate?<br><br>Is there any litter/fly tipped material? | Yes/~~No~~<br><br>~~Yes~~/No<br><br>Yes/~~No~~ | There is a large industrial / retail wheely rubbish bin<br><br>N/A<br>There is a moderate amount of rubbish on site, mainly plastic waste, rubble, glass, and fabric. There are plastic bottles and other waste in the river. |
| Atmospheric | Are there any fumes, odours originating from site or affecting site from neighbouring sites? | Yes/~~No~~ | There is a busy junction at the corner of Salop Road and St Giles way which is a source of air pollution from car exhausts. |
| Access / Further Investigations | If a Phase 2 Investigation is likely to be required, describe any access problems including headroom where relevant, services, overhead cables, restricted access areas, confined spaces, trafficked areas, etc that are likely to affect investigation scope/techniques.<br><br>Identify possible site office and storage locations.<br><br>Identify possible water supply | | There is one mature tree on the south east corner of the site on the banks of the river which overhangs the site.<br><br>Most of the site is made ground<br><br>The access is via double gates 4.5 m wide on the north side of the site onto Rivulet Road.<br><br>Possible water supply is the river however there is water to the site and a stop tap has been located on the pavement on north side of the site approximately 5 m from the site entrance.<br><br>Two well sites were identified 6m from Salop Road boundary and 9 m from Rivulet Road boundary and another 14m from Salop Road and 20 m from Rivulet Road boundary.<br><br>Steel crash barriers exist on the eastern side of the site. And a gate and footbridge to access the river grill, large pipe, drain, and flood measure are present in the north eastern corner of the site.<br><br>There is also a rusty capped off pipe in north western side of the site, close to the wall the purpose of which could not be ascertained. |
| Site Environs | Are there any local features that could have a harmful influence e.g., landfill, industrial processes, railway land?<br><br>Are there any sensitive water features/courses near to the site? | Yes/~~No~~<br><br>Yes/~~No~~ | The site was previously a tannery/ leather works and the surrounding area a gas works. It is also the site off a demolished theatre so there is the possibility that chemicals and asbestos harmful to health could be on site.<br>The Afon Gwenfro river will be sensitive to disruption.<br>The grade II listed bridge is adjacent to site and the stone cut wall extend into the site's southern boundary. |
| Local Knowledge / Anecdotal Evidence | | | N/A |
| Site Dimensions | Describe shape of Site in plan and measure dimensions. | | The maximum dimensions of the proposed site are 55m northeast to southwest and 45m northwest to southeast. The site occupies an area of approximately 0.15 hectares. |

# APPENDIX 4

# REPORT LIMITATIONS

## LIMITATIONS

This contract was completed by Earth Environmental & Geotechnical Ltd based on a defined programme and scope of works and terms and conditions agreed with the client. This report was compiled with all reasonable skill, and care, bearing in mind the project objectives, the agreed scope of works, the prevailing site conditions, the budget, and staff resources allocated to the project.

Other than that, expressly contained in the above paragraph, Earth Environmental & Geotechnical Ltd provides no other representation or warranty whether express or implied, is made in relation to the services. Unless otherwise agreed this report has been prepared exclusively for the use and reliance of the client in accordance with generally accepted consulting practices and for the intended purposes as stated in the agreement under which this work was completed. This report may not be relied upon, or transferred to, by any other party without the written agreement of a Director of Earth Environmental & Geotechnical Ltd.

If a third party relies on this report, it does so wholly at its own and sole risk and Earth Environmental & Geotechnical Ltd disclaims any liability to such parties.

It is Earth Environmental & Geotechnical Ltd understanding that this report is to be used for the purpose described in the introduction to the report. That purpose was an important factor in determining the scope and level of the services. Should the purpose for which the report is used, or the proposed use of the site change, this report will no longer be valid and any further use of, or reliance upon the report in those circumstances by the client without Earth Environmental & Geotechnical Ltd review and advice shall be at the client's sole and own risk.

The report was written in 2021 and should be read considering any subsequent changes in legislation, statutory requirements, and industry best practices. Ground conditions can also change over time and further investigations, or assessment should be made if there is any significant delay in acting on the findings of this report. The passage of time may result in changes in site conditions, regulatory or other legal provisions, technology or economic conditions which could render the report inaccurate or unreliable. The information and conclusions contained in this report should not be relied upon in the future without the written advice of Earth Environmental & Geotechnical Ltd. In the absence of such written advice of Earth Environmental & Geotechnical Ltd, reliance on the report in the future shall be at the client's own and sole risk. Should Earth Environmental & Geotechnical Ltd be requested to review the report in the future, Earth Environmental & Geotechnical Ltd shall be entitled to additional payment at the then existing rate or such other terms as may be agreed between Earth Environmental & Geotechnical Ltd and the client.

The observations and conclusions described in this report are based solely upon the services that were provided pursuant to the agreement between the client and Earth Environmental & Geotechnical Ltd. Earth Environmental & Geotechnical Ltd has not performed any observations, investigations, studies or testing not specifically set out or mentioned within this report.

Earth Environmental & Geotechnical Ltd is not liable for the existence of any condition, the discovery of which would require performance of services not otherwise contained in the services. For the avoidance of doubt, unless otherwise expressly referred to in the introduction to this report, Earth Environmental & Geotechnical Ltd did not seek to evaluate the presence on or off the site of electromagnetic fields, lead paint, radon gas or other radioactive materials.

The services are based upon Earth Environmental & Geotechnical Ltd observations of existing physical conditions at the site gained from a walkover survey of the site together with Earth Environmental & Geotechnical Ltd interpretation of information including documentation, obtained from third parties and from the client on the history and usage of the site. The findings and recommendations contained in this report are based in part upon information provided by third parties, and whilst Earth Environmental & Geotechnical Ltd have no reason to doubt the accuracy and that it has been provided in full of those it was requested from, the items relied on have not been verified.

No responsibility can be accepted for errors within third party items presented in this report. Further Earth Environmental & Geotechnical Ltd was not authorised and did not attempt to independently verify the accuracy or completeness of information, documentation or materials received from the client or third parties, including laboratories and information services, during the performance of the services. Earth Environmental & Geotechnical Ltd is not liable for any inaccurate information, misrepresentation of data or conclusions, the discovery of which inaccuracies required the doing of any act including the gathering of any information which was not reasonably available to Earth Environmental & Geotechnical Ltd and including the doing of any independent investigation of the information provided to Earth Environmental & Geotechnical Ltd save as otherwise provided in the terms of the contract between the client and Earth Environmental & Geotechnical Ltd.

Where field investigations have been carried out these have been restricted to a level of detail required to achieve the stated objectives of the work. Ground conditions can also be variable and as investigation excavations only allow examination of the ground at discrete locations. The potential exists for ground conditions to be encountered which are different to those considered in this report. The extent of the limited area depends on the soil and groundwater conditions, together with the position of any current structures and underground facilities and natural and other activities on site. In addition, chemical analysis was carried out for a limited number of parameters [as stipulated in the contract between the client and Earth Environmental & Geotechnical Ltd] based on an understanding of the available operational and historical information, and it should not be inferred that other chemical species are not present.

The groundwater conditions entered on the exploratory hole records are those observed at the time of investigation. The normal speed of investigation usually does not permit the recording of an equilibrium water level for any one water strike. Moreover, groundwater levels are subject to seasonal variation or changes in local drainage conditions and higher groundwater levels may occur at other times of the year than were recorded during this investigation.

Any site drawing(s) provided in this report is (are) not meant to be an accurate base plan but is (are) used to present the general relative locations of features on, and surrounding, the site.