

Phase 1 contaminated land report

Bettisfield Boatyard, The Moorings,
Bettisfield, Whitchurch, SY13 2LJ

Site address	Bettisfield Boatyard The Moorings Bettisfield Whitchurch SY13 2LJ
Site coordinates	345878, 335507
Report prepared for	Mark Stokes 4 Eatonfield Close Bettisfield Whitchurch Shropshire SY13 2LY
Report reference	4257R1
Report status	Final
Date issued	06 April 2022
Report author	Andy Singleton Technical Director



Report summary: contaminated land risks

The purpose of this Ground First report is to provide clear and pragmatic advice regarding the nature and potential significance of contaminated land hazards which may be present at the study site.

Potential contaminated land risks have been assessed by considering two key items:

1. The likelihood that **sources of contamination** are present within the sub surface beneath the site. This gives a measure of the potential for contamination to be occurring at the site.
2. The **consequence or severity of any impacts** should contamination be present. The consequence or severity of impact is inferred from the nature of any **potential receptors** (i.e., something that could be adversely affected by a contaminant, such as people, an ecological system, property or a water body) as well as any **relevant pathways** (i.e., a route or means by which a receptor can be exposed to or affected by a contaminant) relating to the site and the surrounding area.

The assessment findings are summarised as follows:

1. Probability/likelihood of contamination being present at the Site	High likelihood	
	Likely	
	Low likelihood	
2. Potential severity/consequence of any impacts	Unlikely	
	Severe	
	Medium	
	Mild	
3. Overall land quality risks posed by the Site	Minor	
	Very high	
	High	
	Moderate	
	Moderate/low	
	Low	
	Very low	

Risk Key

Very High	High	Moderate	Moderate/Low	Low	Very Low
There is a high probability that severe harm could arise to a designated receptor from an identified hazard without appropriate remediation action	Harm is likely to arise to a designated receptor from an identified hazard at the site without appropriate remediation action	It is possible that without appropriate remediation action harm could arise to a designated receptor. It is relatively unlikely that any such harm would be severe, and if any harm were to occur it is more likely that such harm would be relatively mild	It is possible that harm could arise to a designated receptor from an identified hazard. It is likely any harm would be mild	It is possible that harm could arise to a designated receptor from an identified hazard. It is likely that, at worst if any harm was realised any effects would be mild	The presence of an identified hazard does not give rise to the potential to cause harm to a receptor

It is acknowledged that the risk assessment findings are based on documentary sources of information alone. Typically a proportionate programme of intrusive site investigations would be required to fully verify these findings.

Recommendations (for next steps)

	All ACMs currently present within the on-Site storage shed must be appropriately removed by a suitably experienced contractor Barrier pipework may be considered for water supply connections	The 0.03 ha Site was first developed in c. 1975 as part of a moorings and associated canal boat hire operation. The only on-Site structure associated with the boat hire activity is a modest storage shed, which appears to include an asbestos cement roof (in reasonable condition). No bulk fuel or chemical storage is understood to have occurred on-Site; all former boat refuelling activity is reported to have taken place at a separate boat yard located c. 40 m to the north-east. Based on the initial data review and Site walkover findings it is considered unlikely that any significant land contamination is present beneath the Site. The corresponding land quality risks are considered to be low. All ACMs associated with the storage shed must be appropriately removed and disposed of by a suitably experienced and licensed contractor. The low level risks posed by the ingress of any localised organic contamination to future water supply pipework may be further reduced through the use of barrier pipes. The Site owner / developer must ensure that any imported materials used during the redevelopment (including any soils imported to Site for use in the proposed garden areas) are chemically and physically suitable.
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1. Introduction

1.1 Background

The study site (from herein known as 'the Site') is situated at Bettisfield Boatyard, The Moorings, Bettisfield, Whitchurch, SY13 2LJ. The Site occupies an area c. 0.03 ha. A location plan of the Site is shown in Section 1.5. The current Site layout is shown in Section 1.6; this shows that the Site is occupied by a modest shed structure located in the north-east of the Site with some car parking and grassed areas.

Planning approval has been granted by Wrexham County Borough Council (planning application ref: P/2021/0599) for the 'erection of a detached dwelling' at the study Site. The approved development plan is included in Section 1.7; this shows the planned construction of a single dwelling in the east of the Site, parking in the south and a soft standing garden area in the west. It is understood that a package water treatment plant will be positioned in the area of the temporary caravan (in the south-west of the Site).

The planning approval includes several conditions requiring the phased assessment of any contaminated land risks posed by the site. Planning condition 7 requires the following: *No development shall take place until a phased site investigation of the nature and extent of contamination has been carried out and submitted to and approved in writing by the Local Planning Authority. If any contamination is found during the site investigation, no part of the development shall commence until a scheme specifying the measures that will be taken to remediate the site to render it suitable for the development hereby permitted has been submitted to and approved in writing by the Local Planning Authority. The site shall thereafter be remediated in accordance with the approved scheme. If during the course of development any contamination is found that has not been identified in the site investigation, no further development shall take place on those parts of the site where that contamination has been found until an additional scheme*

Ground First was commissioned by Mark Stokes (the Client) in March 2022 to undertake a Land Contamination Assessment (Phase 1 land quality assessment) for the Site in response to planning condition 7.

This report has been undertaken by firstly compiling information concerning the Site and the surrounding area, including current and historical land uses, geological records and registered pollution incidents, as well as observations made during a Site inspection. The information which is gathered has then used to construct a 'conceptual site model', including an understanding of likely contaminant sources, pathways and receptors. Finally, a preliminary assessment of risks posed to identified receptors (i.e., people, buildings or the natural environment) from the anticipated land quality at the Site has been performed. The risk assessment methodology is consistent with CIRIA C552 (2001); see Section 3.4 for details.

1.2 Purpose of this report

The purpose of this report is to provide clear and pragmatic advice regarding the nature and potential significance of any contamination hazards which may be present at the Site.

1.3 Report contents

This report is divided into two sections, as described below:

Section	Content	Purpose
Section 2: LAND QUALITY ASSESSMENT	A summary of the site history and environmental setting, the findings of the preliminary risk assessment and associated recommendations	To present a clear and concise overview of the land quality issues facing the Site, including recommendations of how to manage any land contamination which may be present
Section 3: SUPPORTING INFORMATION	A collection of site specific information on which the land quality assessment is based	To provide detailed information in support of the risk assessment; this section also represents a source of reference data for use in any subsequent site works/assessments

1.4 Report limitations

It is noted that the findings presented in this report are in part based on information supplied by third parties. Whilst we assume that all information is representative of past and present conditions we can offer no guarantee as to its validity.

This report excludes consideration of potential hazards arising from any activities at the Site other than normal use and occupancy for the intended land uses. Hazards associated with any other activities have not been assessed and must be subject to a specific risk assessment by the parties responsible for those activities.

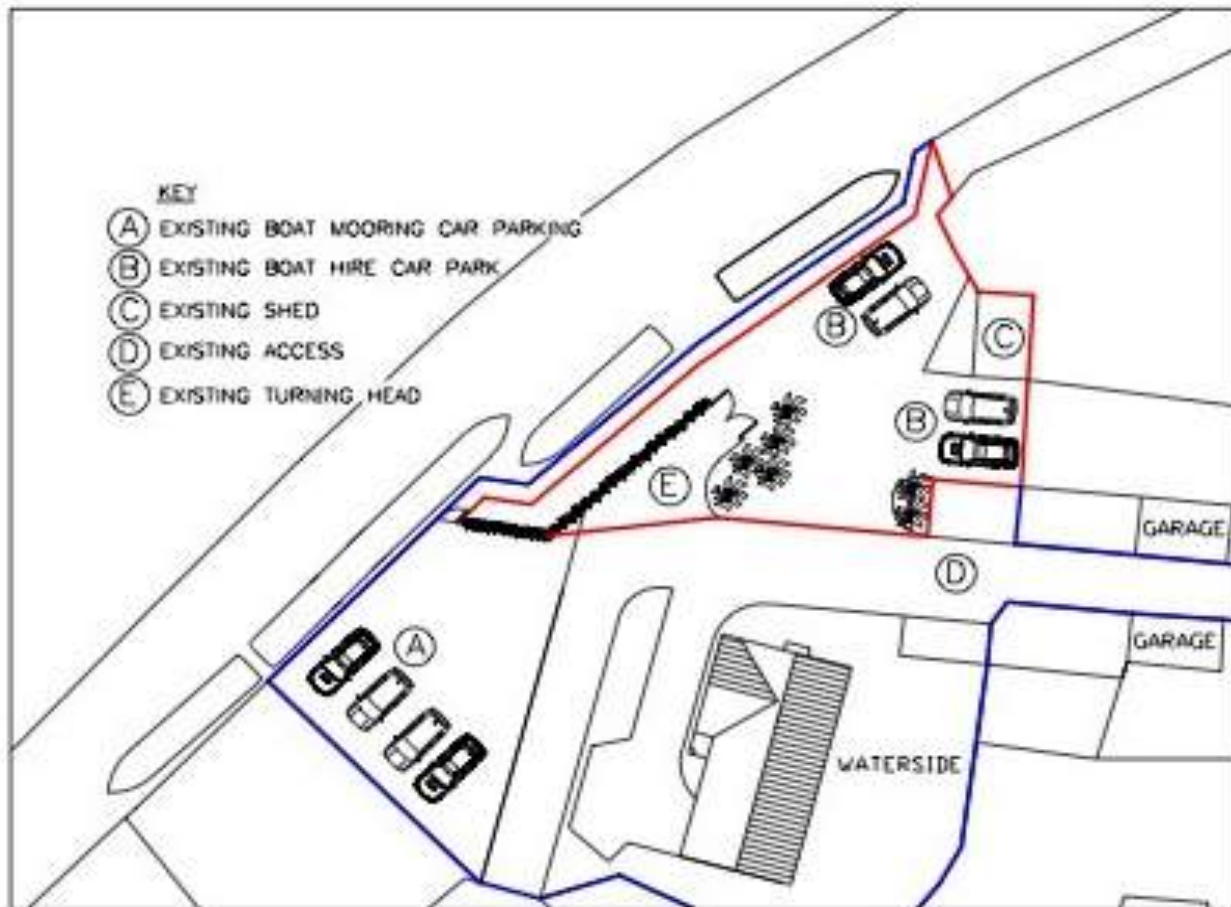
1. Introduction

1.5 Site location plan



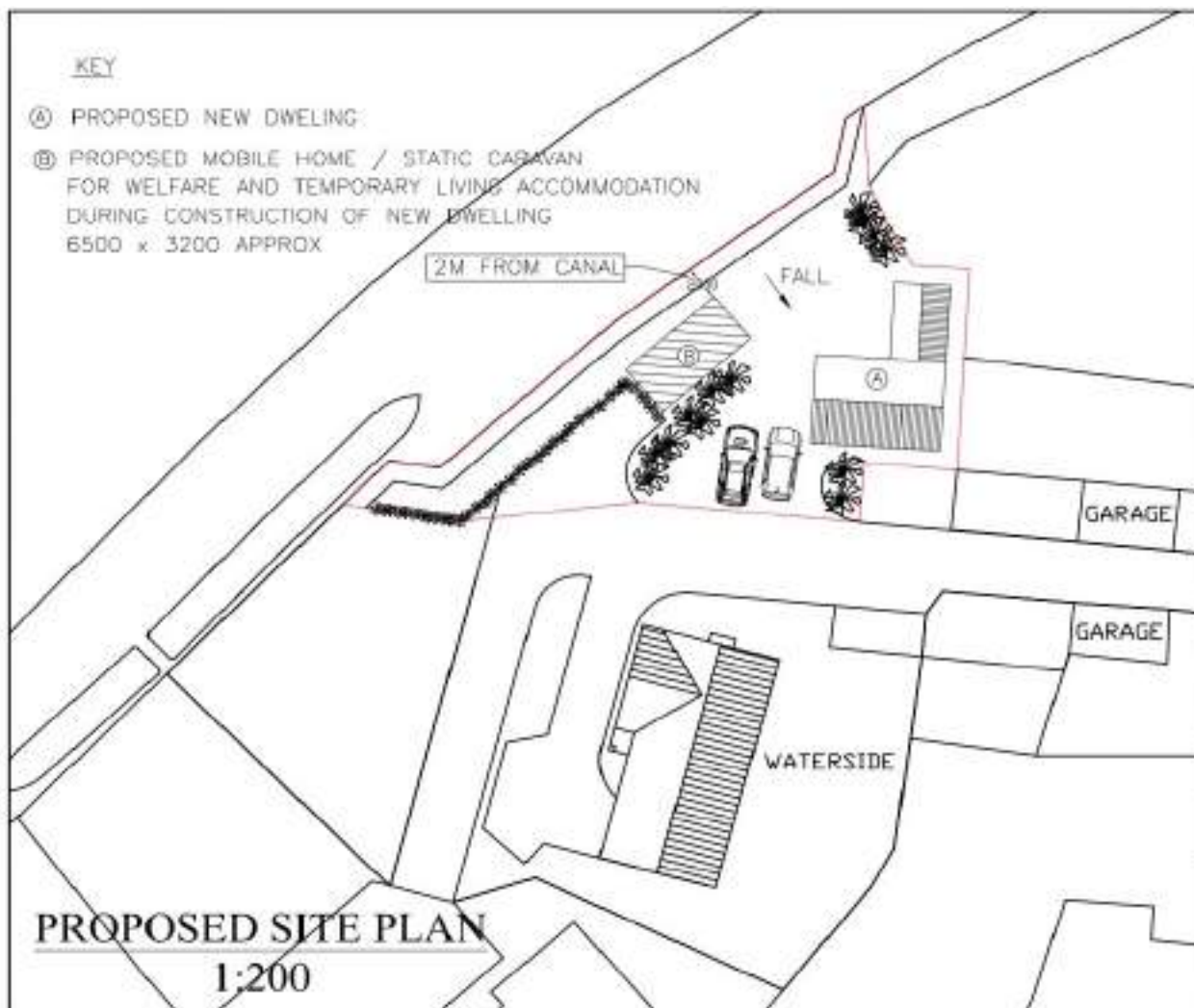
1. Introduction

1.6 Current Site layout



1. Introduction

1.7 Development plan



2. Land quality assessment

2.1 Site details			
Site name:	Bettisfield Boatyard, The Moorings, Bettisfield	Current land cover:	The Site is currently occupied by a small storage shed, a gravelled parking area and grassed surfacing
Current use:	Disused former small scale boatyard, storage shed and parking area		
End use:	Detached residential dwelling with parking and small private garden	Site area:	c. 0.03 ha

2.2 Conceptual understanding (potential sources of contamination)					
 Site history (historical land use based on mapping presented in Section 3.5)	Date	Description of land use	POTENTIAL SOURCES OF CONTAMINATION	Source description	LOW LIKELIHOOD PROBABILITY OF CONTAMINATION
	1873 1:2,500 scale mapping	The Site is undeveloped. A canal (Shropshire Union Canal) is present along the north-western Site boundary. An embankment (associated with the canal) is evident along the north-western edge of the Site. A school and post office are positioned c. 35 m to the south-east. A smithy is located c. 50 m to the south-east. Two adjoining buildings are located alongside the canal c. 35 m to the north-east. A wharf and two limekilns are present c. 80 m to the east.		The land use history suggests that there is potential for contamination to be present at the Site. Potential sources of contamination include:	
	1899 - 1901 1:2,500 scale mapping	No significant land use changes are evident on-Site or within the surrounding land area. A crane is labelled alongside the buildings to the north-east of the Site. A pump (well) is marked in the area of the post office. The limekilns are marked as disused.		Miscellaneous Made Ground resulting from the original construction of the canal.	
	1912 1:2,500 scale mapping	No significant land use changes are evident on-Site or within the surrounding land area.		Asbestos containing materials (ACM) appear to be incorporated within the current shed structure (see also Section 2.4); the past disturbance of any such materials could have resulted in asbestos being present within the sub surface.	
	1929 1:10,560 scale mapping	No significant land use changes are evident on-Site or within the surrounding land area.		Possible historical storage and use of low volume fuels and/or miscellaneous chemicals (including possible paints, thinners, cleaning agents, etc.) associated with the former boat hire operations (note: the Client has indicated the absence of any past or present bulk fuel or chemical storage - see Section 2.4).	
	1949 1:10,560 scale mapping	No significant land use changes are evident on-Site or within the surrounding land area.		Localised fuel and oil leaks associated with the modest on-Site car parking area in the south-east of the Site.	
	1976 1:2,500 scale mapping	No significant land use changes are evident on-Site or within the surrounding land area. The smithy is no longer marked. Various residential development has occurred c. 100 m to 250 m to the south-east of the Site.			
	1995 1:2,500 scale mapping	No significant land use changes are evident on-Site or within the surrounding land area.			
	1999 - 2018 Aerial photography	Aerial photography indicates that the Site has been developed. A small rectangular structure is evident in the north-east of the Site (corresponding to the footprint of the current storage shed). An access drive and small vehicle parking area are present in the south and south-east. The central and western parts of the Site are vegetated. Residential properties have been erected to the east and south of the Site. Canal boats are situated within a mooring directly to the west of the Site.			
	2003 1:1,250 scale mapping	No significant land use changes are evident on-Site or within the surrounding land area.			
	2021 Aerial photography	Aerial photography indicates that a tank is present in the north of the Site; this is understood to have received waste effluent from canal boats which were hired from the Site. A gravel path has been constructed from the Site entrance to the mooring in the north-west of the Site.			
	Additional information	The Client purchased the Site and adjacent land to the south and south-west in 1975; the Site has been associated with the hire of canal boats since this time. The existing mooring was constructed in c. 1980. No significant groundworks are reported to have taken place on-Site since the 1980s. Boat hire ceased in c. 2020 and the Site has remained disused for the last two years.			

2. Land quality assessment

2.2 Conceptual understanding (potential sources of contamination)																											
 Current land use	The Site is occupied by a small storage shed and an adjacent gravelled area, formerly used for car parking. The shed, which includes a suspected asbestos cement roof, is used for general domestic storage. There is no evidence of any current bulk fuel or chemical storage on-Site. Further details of the current Site condition and land use are presented in Section 2.4. Photographs showing the current Site condition are included in Section 3.2.	POTENTIAL SOURCES OF CONTAMINATION	No significant contamination risks have been identified in relation to the current land use. The asbestos roofing material appears to be in reasonable condition with no significant deterioration / defects.	UNLIKELY																							
 Neighbouring commercial / industrial land uses <i>(see environmental data report in Section 3.3 for full listing)</i>	The following commercial land uses are identified in the Site-specific Enviro Insight report within 100 m of the Site: - The 'Moorings' boat mooring is located directly adjacent to the Site. - A wharf is recorded c. 50 m to the north-east of the Site. <table><thead><tr><th>Nr</th><th>Nearest distance</th><th>Land use / permitted activity / authorisation</th></tr></thead><tbody><tr><td>0</td><td>NA</td><td>Fuel station entries</td></tr><tr><td>0</td><td>NA</td><td>Gas pipelines and high voltage underground cables</td></tr><tr><td>0</td><td>NA</td><td>Control of major accident hazards sites (COMAH) or regulated explosive sites</td></tr><tr><td>0</td><td>NA</td><td>Hazardous substance storage / use in accordance with the Planning (Hazardous Substances) Regulations 2015</td></tr><tr><td>0</td><td>NA</td><td>Notification of installations handling hazardous substances (NIHHS) sites</td></tr><tr><td>0</td><td>NA</td><td>Sites determined as Contaminated Land under Part IIA of the Environmental Protection Act 1990</td></tr><tr><td>0</td><td>NA</td><td>Licensed pollution prevention and control sites (Part A(1) or Part A(2)/B)</td></tr></tbody></table>		Nr	Nearest distance	Land use / permitted activity / authorisation	0	NA	Fuel station entries	0	NA	Gas pipelines and high voltage underground cables	0	NA	Control of major accident hazards sites (COMAH) or regulated explosive sites	0	NA	Hazardous substance storage / use in accordance with the Planning (Hazardous Substances) Regulations 2015	0	NA	Notification of installations handling hazardous substances (NIHHS) sites	0	NA	Sites determined as Contaminated Land under Part IIA of the Environmental Protection Act 1990	0	NA	Licensed pollution prevention and control sites (Part A(1) or Part A(2)/B)	No significant contamination risks have been identified in relation to the neighbouring commerical land use.
Nr	Nearest distance	Land use / permitted activity / authorisation																									
0	NA	Fuel station entries																									
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			PROBABILITY OF CONTAMINATION																								

2. Land quality assessment

2.2 Conceptual understanding (potential sources of contamination)				
 EA recorded pollution incidents	No Environment Agency / Natural Resources Wales pollution incidents have been recorded within 100 m of the Site.	POTENTIAL SOURCES OF CONTAMINATION	No associated land quality risks have been identified in regard to the application Site.	NEGLIGIBLE
 Landfills / waste sites <i>(taken within 250m radius of the Site boundary, see environmental data report in Section 3.3 for full listing)</i>	There are no Environment Agency / Natural Resources Wales listed historical landfill located within 500 m of the Site. There are no Environment Agency / Natural Resources Wales listed operational landfills located within 500 m of the Site. There are no registered waste exemptions within 100 m of the Site. The following other waste sites are registered within 500 m of the Site: 0 Records of registered waste transfer sites. 0 Records of registered waste treatment or disposal sites. 0 Records of licensed waste management facilities.		Given the absence of any known landfill sites within close proximity of the Site no associated contamination hazards have been identified. Given the absence of any waste treatment, transfer or disposal sites within close proximity of the Site no associated contamination hazards have been identified.	NEGLIGIBLE
 Radon	According to data included within the Enviro Insight report the Site lies in an area where less than 1% of homes are at or above the UK radon action level (200 Bq/m3).		No specific radon protection measures are likely to be required as part of the Site redevelopment.	UNLIKELY

2. Land quality assessment

2.3 Conceptual understanding (environmental sensitivity / potential severity of impacts)				
 Geology and groundwater (see the environmental data report in Section 3.3 for full details)	British Geological Survey (BGS) mapping indicates the presence Till (diamicton - sandy, gravelly clay) beneath the Site. The superficial deposits are classified as a Secondary (Undifferentiated) Aquifer. The groundwater vulnerability of the superficial aquifer is classified as Medium.	POTENTIAL RECEPTORS	A Secondary (Undifferentiated) Aquifer is assigned in cases where it has not been possible to attribute either category A or B to a rock type. In most cases, this means that the layer in question has previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type.	MILD
	BGS mapping indicates that the bedrock geology consists of the Sidmouth Mudstone Formation which is classified as a Secondary B Aquifer. The groundwater vulnerability of the bedrock aquifer is classified as Low. The Enviro Insight report indicates that there is a low risk of groundwater flooding at or within 50 m of the Site. There are no BGS borehole records within 100 m of the Site. There are no mapped Source Protection Zones (SPZ) within a 500m radius of the Site. There are no active groundwater abstraction licenses within 2 km of the Site.		A Secondary (B) Aquifer is likely to comprise lower permeability layers which may yield limited amounts of groundwater due to localised fissures, thin permeable horizons and weathering.	

2. Land quality assessment

2.3 Conceptual understanding (environmental sensitivity / potential severity of impacts)					
 Geohazards	The Site is not mapped within an area potentially affected by past coal mining. The Site is not mapped at a location which has potentially been affected by salt or brine extraction. Given the known land use history of the Site some localised Made Ground deposits are anticipated to be present beneath the Site. No natural hazards (with a hazard rating of moderate or above) are recorded by the BGS at the Site.	POTENTIAL RECEPTORS	No significant geohazards have been identified based on information contained within the available Enviro Insight report although a separate geotechnical assessment may be required in order to further inform the proposed building foundation design.	MINOR	POTENTIAL SEVERITY OF IMPACT
 Surface water <i>(see the environmental data report in Section 3.3 for full details)</i>	The Shropshire Union Canal / Llangollen Canal is positioned alongside the north-western Site boundary. In 2019 the chemical water quality rating for the canal was 'fail', whereas the ecological rating was 'good'. The Site is located within Flood Zone 1. There are no licensed surface water abstractions within 1 km of the Site.		The neighbouring canal could potentially be at risk from any on-Site contamination subject to the nature and scale of the contamination and the presence of a viable contamination pathway(s). The likely lined nature of the Site will likely constrain any such risks.	MILD	
 Environmental designations <i>(see the environmental data report in Section 3.3 for full details)</i>	There are no environmentally designated sites recorded within 500m of the Site		No associated contamination risks have been identified.	NEGLIGIBLE	
 Human receptors	Proposed residents/users of the Site.		Human receptors are proposed to be present on Site.	SEVERE	

2. Land quality assessment

2.4 Site inspection (see photographs in Section 3.2)			
Inspection date	30/03/2022	General site condition	The Site is orderly and well kept.
Ground First consultant	Andy Singleton	Site contact (position)	Bev Stokes (Site owner)
Topography	There is a distinct fall in level of c. 1.5 m from the higher ground in the north-west (alongside the canal) to the lower ground in the east (on which the storage shed and former parking area are positioned). See photographs contained in Section 3.2. The fall in levels across the Site is consistent with the surrounding landform and reflects the presence of the long standing canal embankment (i.e., constructed prior to the first available land use mapping dating from 1873).	Ground cover	The south-eastern and south-western parts of the Site are covered by imported gravel / hard core (corresponding to the entrance drive and modest parking areas). The sloping ground in the central part of the Site is partly grass covered with some localised gravel material. The higher ground in the west of the Site is typically grass covered. A collection of small trees and shrubs is situated in the central-southern part of the Site.
Current site land use	The Site is currently disused; the on-Site shed (see opposite) is used for general domestic storage. No vehicles are stored on-Site.	On-Site structures	A modest storage shed is located in the north-east of the Site. The shed is constructed from concrete panel walls with a cast in-situ concrete floor. The shed roofing is formed from suspected asbestos cement sheeting which appears to be in reasonable condition. The Site owner indicated that the shed was erected in c. 1975. At the time of the site visit the shed was used for the storage of timber, building insulation materials, garden furniture, several tyres and other domestic products.
Visual / olfactory evidence of contamination	No obvious ground contamination was observed on-Site. A short section of trenching (associated with a potable water supply pipe) was observed close to the Site entrance (see photographs contained in Section 3.2). The trench section was 0.45 m deep - the exposed soils comprised a 0.3 m thickness of sand and gravel (including imported hard core) overlying 0.15 m+ of orange-brown gravelly sand. No appreciable man-made material was observed within the trench.	On site drainage	No engineered drainage is present on-Site.

2. Land quality assessment

2.4 Site inspection (see photographs in Section 3.2)				
Bulk storage tanks (fuel and chemical storage)	There are no above or underground fuel or chemical storage tanks / containers at the Site. The Site owner confirmed that previously all hire boats were refuelled at the boatyard / wharf positioned c. 40m to the north-east of the Site. A double-skinned waste effluent tank is positioned in the north of the Site; this above ground plastic tank was placed in around 2019 in order to collect waste water from the hire boats. When in use, the tank was periodically emptied by tanker. An above ground heating oil tank is positioned directly to the east of the Site (associated with the neighbouring domestic property). The tank is of a modern plastic, double-skinned construction. The Site owner is not aware of any leaks or spillages associated with the tank.		Invasive species	No direct evidence of any invasive species was observed during the site walkover.
Neighbouring land uses	N	Canal and agricultural land beyond	Off-site contaminant sources	The surrounding land is predominantly residential in nature; no obvious contaminant sources were observed in relation to the neighbouring properties, with the exception of a heating oil tank situated directly to the east of the Site; this feature is of a modern construction with no known pollution incidents.
	S	Residential dwellings		
	E	Residential dwellings		
	W	Canal and agricultural land beyond		
Local water features	A canal, and associated mooring, are located along the north-western Site boundary. The mooring is formed from a concrete wall. No natural water courses are present within the close vicinity of the Site.		Distance to nearest residential property	Residential properties are located within 15 m to the east and south of the Site.

2. Land quality assessment

2.5 Preliminary Risk Assessment								
Nr	Sources	Pathways	TYPE	Receptors	Consequence	Probability	Risk classification	Comments
On-Site sources								
1	Potential for inorganic and low volatility organic contaminants to be present within the subsurface soils (including any localised / miscellaneous contaminants associated with possible in situ Made Ground)	Dermal contact, soil & soil dust ingestion, inhalation of soil dust	HH	Future Site occupants & construction workers	MEDIUM	UNLIKELY	LOW RISK	The risk ratings reflect the likely absence of significant contamination at the Site based on the known land use history (including the absence of any past or present bulk fuel or chemical storage and the likely absence of any appreciable Made Ground - reflecting the absence of any previous development / demolition activity) plus the proposed presence of building cover and hard standing over the area used for vehicle parking since the mid 1970s.
2		Consumption of home grown produce	HH	Future Site occupants	MEDIUM	UNLIKELY	LOW RISK	
3		Ingress into water supply pipework and subsequent water ingestion	HH	Future Site occupants	MEDIUM	UNLIKELY	LOW RISK	
4		Building materials in direct contact with aggressive ground	PROP	Future site buildings	MEDIUM	UNLIKELY	LOW RISK	Aggressive ground conditions are not anticipated at the Site although Site-specific soil testing would be required to verify this.
5		Overland run-off plus potential dissolution into pore water/shallow groundwater and subsequent lateral migration	CW	Llangollen Canal	MEDIUM	UNLIKELY	LOW RISK	The risk ratings reflect the limited potential for significant ground contamination, the modest Site area, the likely lined nature of the canal, and the limited resource potential of the underlying aquifers. The controlled waters risks are further constrained by the absence of any licensed abstractions or groundwater SPZs within the Site locality.
6		Dissolution into pore water/shallow groundwater and subsequent lateral and vertical migration	CW	Glacial Till (Secondary Undifferentiated Aquifer)	MEDIUM	UNLIKELY	LOW RISK	
7		Dissolution into pore water/shallow groundwater and subsequent lateral and vertical migration	CW	Sidmouth Mudstone Formation (Secondary B Aquifer)	MEDIUM	UNLIKELY	LOW RISK	

2. Land quality assessment

2.5 Preliminary Risk Assessment								
Nr	Sources	Pathways	TYPE	Receptors	Consequence	Probability	Risk classification	Comments
8	Potential for volatile organic contaminants to be present within the subsurface soils (note: given the apparent nature of the on-Site land uses undertaken during the last 40+ years, there is considered to be limited potential for any residual vapour phase contamination)	Dermal contact, ingestion & inhalation of soils & soil dust	HH	Future Site occupants & construction workers	MEDIUM	UNLIKELY	LOW RISK	The risk ratings reflect the likely absence of any significant vapour phase contamination at the Site based on the known land use history (including the absence of any past or present bulk fuel or chemical storage and the likely absence of any appreciable Made Ground - reflecting the absence of any previous development / demolition activity) plus the proposed presence of building cover and hard standing over the area used for vehicle parking since the mid 1970s.
9		Consumption of home grown produce	HH	Future Site occupants	MEDIUM	UNLIKELY	LOW RISK	
10		Ingress into water supply pipework and subsequent water ingestion	HH	Future Site occupants	MEDIUM	UNLIKELY	LOW RISK	The low level risks posed by the ingress of any organic contamination to water supply pipework may be further reduced through the use of barrier pipework.
11		Migration of vapours to surface; inhalation indoors	HH	Future Site occupants	MEDIUM	UNLIKELY	LOW RISK	The risk ratings reflect the likely absence of any significant vapour phase contamination at the Site based on the known land use history (including the absence of any past or present bulk fuel or chemical storage and the likely absence of any appreciable Made Ground).
12		Migration of vapours to surface; inhalation outdoors	HH	Future Site occupants & construction workers	MEDIUM	UNLIKELY	LOW RISK	

2. Land quality assessment

2.5 Preliminary Risk Assessment								
Nr	Sources	Pathways	TYPE	Receptors	Consequence	Probability	Risk classification	Comments
13	Potential for volatile organic contaminants to be present within the subsurface soils (note: given the apparent nature of the on-Site land uses undertaken during the last 40+ years, there is considered to be limited potential for any residual vapour phase contamination)	Overland run-off plus potential dissolution into pore water/shallow groundwater and subsequent lateral migration	CW	Llangollen Canal	MEDIUM	UNLIKELY	LOW RISK	The risk ratings reflect the limited potential for significant vapour phase contamination, the modest Site area, the likely lined nature of the canal, and the limited resource potential of the underlying aquifers. The controlled waters risks are further constrained by the absence of any licensed abstractions or groundwater SPZs within the Site locality.
14		Dissolution into pore water/shallow groundwater and subsequent lateral and vertical migration	CW	Glacial Till (Secondary Undifferentiated Aquifer)	MEDIUM	UNLIKELY	LOW RISK	
15		Dissolution into pore water/shallow groundwater and subsequent lateral and vertical migration	CW	Sidmouth Mudstone Formation (Secondary B Aquifer)	MEDIUM	UNLIKELY	LOW RISK	
16	Potential for asbestos containing materials (ACM) to be present within the sub surface soils	Disturbance of in situ soils resulting in the liberation of any asbestos fibres to atmosphere and potential inhalation	HH	Construction workers	MEDIUM	UNLIKELY	LOW RISK	The risk ratings reflects the long standing presence of suspected asbestos cement sheeting on the modest storage shed structure. However, these roofing materials appear to be in good condition and hence no appreciable ACMs are anticipated within the surrounding soils. Appropriate removal and off-Site disposal of all ACMs will be required prior to the commencement of the development works.
17			HH	Future Site occupants	MEDIUM	UNLIKELY	LOW RISK	

2. Land quality assessment

2.5 Preliminary Risk Assessment								
Nr	Sources	Pathways	TYPE	Receptors	Consequence	Probability	Risk classification	Comments
18	Potential for methane to be present within the subsurface soils (potentially associated with any Made Ground present on Site)	Lateral and vertical migration into proposed structures; potential to cause an explosion	HH	Proposed on-Site property and associated occupants	MEDIUM	UNLIKELY	LOW RISK	The risk ratings reflect the likely absence of an appreciable gas source in the context of the known land use history and the anticipated limited thickness and aged nature of any Made Ground.
19	Potential for carbon dioxide to be present within the subsurface soils (potentially associated with any Made Ground present on Site)	Lateral and vertical migration into proposed structures; potential to cause asphyxiation/toxic effects	HH	Future Site occupants	MEDIUM	UNLIKELY	LOW RISK	
	RISK RATING (on-Site sources)						LOW RISK	

2. Land quality assessment

2.6 Conclusions and next steps		
✓	All ACMs currently present within the on-Site storage shed must be appropriately removed by a suitably experienced contractor Barrier pipework may be considered for water supply connections	The 0.03 ha Site was first developed in c. 1975 as part of a moorings and associated canal boat hire operation. The only on-Site structure associated with the boat hire activity is a modest storage shed, which appears to include an asbestos cement roof (in reasonable condition). No bulk fuel or chemical storage is understood to have occurred on-Site; all former boat refuelling activity is reported to have taken place at a separate boat yard located c. 40 m to the north-east. Based on the initial data review and Site walkover findings it is considered unlikely that any significant land contamination is present beneath the Site. The corresponding land quality risks are considered to be low. All ACMs associated with the storage shed must be appropriately removed and disposed of by a suitably experienced and licensed contractor. The low level risks posed by the ingress of any localised organic contamination to future water supply pipework may be further reduced through the use of barrier pipes. The Site owner / developer must ensure that any imported materials used during the redevelopment (including any soils imported to Site for use in the proposed garden areas) are chemically and physically suitable.

3. Supporting information

The following supporting information is contained in this section:

Section	Content
3.1	Referenced materials used in the Phase 1 reporting
3.2	Site photographs
3.3	Published environmental data records (Groundsure Enviro and Geo Insight report for BETTISFIELD BOATYARD, THE MOORINGS, BETTISFIELD, WHITCHURCH, SY13 2LJ. REF: GS-8629455) including: • Aerial photographs and site map • Environmental permits, incidents and registers • Landfill and other waste sites • Current land use information • Geology • Hydrogeology and hydrology • Flooding • Designated environmentally sensitive sites • Other environmental factors
3.4	Risk assessment methodology
3.5	Historical land use mapping

Disclaimer

This report has been prepared by Ground First in its professional capacity as a contaminated land consultancy, with reasonable skill, care and diligence within the agreed scope and terms of contract and taking account of the manpower and resources devoted to it by agreement with its client, and is provided by Ground First solely for the internal use of its client.

The advice and opinions in this report should be read and relied on only in the context of the report as a whole, taking account of the terms of reference agreed with the client. The findings are based on the information made available to Ground First at the date of the report (and will have been assumed to be correct) and on current UK standards, codes, technology and practices as at that time. They do not purport to include any manner of legal advice or opinion. New information or changes in conditions and regulatory requirements may occur in future, which will change the conclusions presented here.

This report is confidential to the client. The client may submit the report to regulatory bodies, where appropriate. Should the client wish to release this report to any other third party for that party's reliance, Ground First may, by prior written agreement, agree to such release, provided that it is acknowledged that Ground First accepts no responsibility of any nature to any third party to whom this report or any part thereof is made known. Ground First accepts no responsibility for any loss or damage incurred as a result, and the third party does not acquire any rights whatsoever, contractual or otherwise, against Ground First except as expressly agreed with Ground First in writing.

3. Supporting information

3.1 References

The following references were used to inform the conceptual site model and preliminary risk assessment:

British Geological Survey, 2022. Geology of Britain viewer (<http://www.bgs.ac.uk/discoveringGeology/geologyOfBritain/viewer.html>).

British Standards Institute, 2011. Investigation of potentially contaminated sites – code of practice. BS 10175:2011+A2:2017.

CIRIA, 2001. Contaminated land risk assessment. A guide to good practice. Publication C552. CIRIA London. ISBN 0-86017-552 9.

Environment Agency, 2020. Land Contamination Risk Management (<https://www.gov.uk/government/publications/land-contamination-risk-management-lcm>).

Groundsure, 2022. Groundsure Enviro and Geo Insight report for BETTISFIELD BOATYARD, THE MOORINGS, BETTISFIELD, WHITCHURCH, SY13 2LJ. REF: GS-8629455

3. Supporting information

3.2 Site photographs



Photograph 1

Description: Access road to site

Date: 30/03/2022

Location: View along The Moorings access road – looking to the east



Photograph 2

Description: Southern Site boundary

Date: 30/03/2022

Location: View from access road – looking to the west



Photograph 3

Description: Site entrance

Date: 30/03/2022

Location: View from access road – looking to the north



Photograph 4

Description: Western end of the Site

Date: 30/03/2022

Location: View from access road – looking to the north-west



Photograph 5

Description: Western end of the Site

Date: 30/03/2022

Location: View from The Moorings – looking to the north-east



Photograph 6

Description: Eastern end of the Site

Date: 30/03/2022

Location: View from Site entrance – looking to the north-east



Photograph 7

Description: Former parking area

Date: 30/03/2022

Location: South-eastern corner of the Site – looking to the east



Photograph 8

Description: Neighbouring above ground heating oil tank (modern construction)

Date: 30/03/2022

Location: Tank located directly to the east of the Site



Photograph 9

Description: Gravelled surface across former parking area

Date: 30/03/2022

Location: South-eastern corner of the Site



Photograph 10

Description: Storage shed

Date: 30/03/2022

Location: Eastern site boundary – looking to the north-east



Photograph 11

Description: Storage shed; including suspected asbestos cement roofing material

Date: 30/03/2022

Location: Eastern site boundary – looking to the east



Photograph 12

Description: Suspected asbestos cement roofing material on storage shed

Date: 30/03/2022

Location: Internal view of shed (eastern Site boundary)



Photograph 13

Description: General storage within shed

Date: 30/03/2022

Location: Internal view of shed (eastern Site boundary)



Photograph 14

Description: Concrete base within storage shed

Date: 30/03/2022

Location: Internal view of shed (eastern Site boundary)



Photograph 15

Description: Steeply sloping ground in-between storage shed and canal

Date: 30/03/2022

Location: Northern part of the Site - looking from shed towards the west



Photograph 16

Description: Grassed area in the north of the Site

Date: 30/03/2022

Location: View from mid-point on western Site boundary – looking to the north-east



Photograph 17

Description: Former foul effluent tank (used to store waste-water from barges)

Date: 30/03/2022

Location: Northern corner of the Site



Photograph 18

Description: Grassed area alongside the canal

Date: 30/03/2022

Location: View from mid-point on western Site boundary – looking to the south-west



Photograph 19

Description: Exposed earth at ground surface

Date: 30/03/2022

Location: Western Site boundary



Photograph 20

Description: Mooring construction

Date: 30/03/2022

Location: North-western end of the Site – looking to the north-east



Photograph 21

Description: Service excavation

Date: 30/03/2022

Location: Land to east of the Site entrance



Photograph 22

Description: Ground sequence within service excavation

Date: 30/03/2022

Location: Land to east of the Site entrance



Photograph 23

Description: Boat shed adjacent to canal

Date: 30/03/2022

Location: Boat shed positioned c. 40 m north-east of the study Site



Photograph 24

Description: Historical canal wharf

Date: 30/03/2022

Location: Wharf positioned c. 70 m to the east of the Site

3. Supporting information

3.3 Environmental data report

Readily available environmental information relating to the Site and its surrounding area is contained within a Site-specific Enviro+Geo Insight report produced by Groundsure.

BETTISFIELD BOATYARD, THE MOORINGS, BETTISFIELD, WHITCHURCH, SY13 2LJ

Order Details

Date: 28/03/2022
Your ref: 4257
Our Ref: GS-8629455
Client: Andrew Singleton

Site Details

Location: 345878 335507
Area: 0.03 ha
Authority: [Wrexham - Wrexham County Borough Council](#)



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Summary of findings

p. 2

Aerial image

p. 8

OS MasterMap site plan

p.13

groundsure.com/insightuserguide

Contact us with any questions at:

info@groundsure.com

08444 159 000

Summary of findings

Page	Section	Past land use	On site	0-50m	50-250m	250-500m	500-2000m
14	1.1	<u>Historical industrial land uses</u>	0	1	26	33	-
17	1.2	Historical tanks	0	0	0	0	-
17	1.3	Historical energy features	0	0	0	0	-
17	1.4	Historical petrol stations	0	0	0	0	-
18	1.5	Historical garages	0	0	0	0	-
18	1.6	Historical military land	0	0	0	0	-
Page	Section	Past land use - un-grouped	On site	0-50m	50-250m	250-500m	500-2000m
19	2.1	<u>Historical industrial land uses</u>	0	1	29	41	-
22	2.2	Historical tanks	0	0	0	0	-
22	2.3	Historical energy features	0	0	0	0	-
23	2.4	Historical petrol stations	0	0	0	0	-
23	2.5	Historical garages	0	0	0	0	-
Page	Section	Waste and landfill	On site	0-50m	50-250m	250-500m	500-2000m
24	3.1	Active or recent landfill	0	0	0	0	-
24	3.2	Historical landfill (BGS records)	0	0	0	0	-
25	3.3	Historical landfill (LA/mapping records)	0	0	0	0	-
25	3.4	Historical landfill (EA/NRW records)	0	0	0	0	-
25	3.5	Historical waste sites	0	0	0	0	-
25	3.6	Licensed waste sites	0	0	0	0	-
25	3.7	<u>Waste exemptions</u>	0	0	8	1	-
Page	Section	Current industrial land use	On site	0-50m	50-250m	250-500m	500-2000m
27	4.1	<u>Recent industrial land uses</u>	0	2	2	-	-
28	4.2	Current or recent petrol stations	0	0	0	0	-
28	4.3	Electricity cables	0	0	0	0	-
28	4.4	Gas pipelines	0	0	0	0	-
28	4.5	Sites determined as Contaminated Land	0	0	0	0	-



28	4.6	Control of Major Accident Hazards (COMAH)	0	0	0	0	-
29	4.7	Regulated explosive sites	0	0	0	0	-
29	4.8	Hazardous substance storage/usage	0	0	0	0	-
29	4.9	Historical licensed industrial activities (IPC)	0	0	0	0	-
29	4.10	Licensed industrial activities (Part A(1))	0	0	0	0	-
29	4.11	Licensed pollutant release (Part A(2)/B)	0	0	0	0	-
30	4.12	Radioactive Substance Authorisations	0	0	0	0	-
30	4.13	<u>Licensed Discharges to controlled waters</u>	0	0	2	0	-
30	4.14	Pollutant release to surface waters (Red List)	0	0	0	0	-
31	4.15	Pollutant release to public sewer	0	0	0	0	-
31	4.16	List 1 Dangerous Substances	0	0	0	0	-
31	4.17	List 2 Dangerous Substances	0	0	0	0	-
31	4.18	<u>Pollution Incidents (EA/NRW)</u>	0	0	1	0	-
32	4.19	Pollution inventory substances	0	0	0	0	-
32	4.20	Pollution inventory waste transfers	0	0	0	0	-
32	4.21	Pollution inventory radioactive waste	0	0	0	0	-
Page	Section	Hydrogeology	On site	0-50m	50-250m	250-500m	500-2000m
33	5.1	<u>Superficial aquifer</u>	Identified (within 500m)				
35	5.2	<u>Bedrock aquifer</u>	Identified (within 500m)				
37	5.3	<u>Groundwater vulnerability</u>	Identified (within 50m)				
38	5.4	<u>Groundwater vulnerability- soluble rock risk</u>	Identified (within 0m)				
39	5.5	Groundwater vulnerability- local information	None (within 0m)				
40	5.6	<u>Groundwater abstractions</u>	0	0	0	0	5
42	5.7	<u>Surface water abstractions</u>	0	0	0	0	2
42	5.8	Potable abstractions	0	0	0	0	0
43	5.9	Source Protection Zones	0	0	0	0	-
43	5.10	Source Protection Zones (confined aquifer)	0	0	0	0	-
Page	Section	Hydrology	On site	0-50m	50-250m	250-500m	500-2000m
44	6.1	<u>Water Network (OS MasterMap)</u>	0	1	10	-	-

45	6.2	<u>Surface water features</u>	1	0	8	-	-
46	6.3	<u>WFD Surface water body catchments</u>	1	-	-	-	-
46	6.4	<u>WFD Surface water bodies</u>	0	1	0	-	-
47	6.5	<u>WFD Groundwater bodies</u>	1	-	-	-	-
Page	Section	River and coastal flooding	On site	0-50m	50-250m	250-500m	500-2000m
48	7.1	Risk of flooding from rivers and the sea	None (within 50m)				
48	7.2	Historical Flood Events	0	0	0	-	-
48	7.3	Flood Defences	0	0	0	-	-
49	7.4	Areas Benefiting from Flood Defences	0	0	0	-	-
49	7.5	Flood Storage Areas	0	0	0	-	-
50	7.6	Flood Zone 2	None (within 50m)				
50	7.7	Flood Zone 3	None (within 50m)				
Page	Section	Surface water flooding					
51	8.1	<u>Surface water flooding</u>	1 in 30 year, 0.1m - 0.3m (within 50m)				
Page	Section	Groundwater flooding					
53	9.1	<u>Groundwater flooding</u>	Moderate (within 50m)				
Page	Section	Environmental designations	On site	0-50m	50-250m	250-500m	500-2000m
54	10.1	<u>Sites of Special Scientific Interest (SSSI)</u>	0	0	0	0	4
55	10.2	<u>Conserved wetland sites (Ramsar sites)</u>	0	0	0	0	2
57	10.3	<u>Special Areas of Conservation (SAC)</u>	0	0	0	0	3
58	10.4	Special Protection Areas (SPA)	0	0	0	0	0
59	10.5	<u>National Nature Reserves (NNR)</u>	0	0	0	0	8
59	10.6	Local Nature Reserves (LNR)	0	0	0	0	0
59	10.7	<u>Designated Ancient Woodland</u>	0	0	0	0	8
60	10.8	Biosphere Reserves	0	0	0	0	0
60	10.9	Forest Parks	0	0	0	0	0
60	10.10	Marine Conservation Zones	0	0	0	0	0
61	10.11	Green Belt	0	0	0	0	0
61	10.12	Proposed Ramsar sites	0	0	0	0	0



61	10.13	Possible Special Areas of Conservation (pSAC)	0	0	0	0	0
61	10.14	Potential Special Protection Areas (pSPA)	0	0	0	0	0
61	10.15	Nitrate Sensitive Areas	0	0	0	0	0
62	10.16	<u>Nitrate Vulnerable Zones</u>	2	0	0	2	2
63	10.17	<u>SSSI Impact Risk Zones</u>	1	-	-	-	-
64	10.18	<u>SSSI Units</u>	0	0	0	0	8
Page	Section	Visual and cultural designations	On site	0-50m	50-250m	250-500m	500-2000m
68	11.1	World Heritage Sites	0	0	0	-	-
69	11.2	Area of Outstanding Natural Beauty	0	0	0	-	-
69	11.3	National Parks	0	0	0	-	-
69	11.4	<u>Listed Buildings</u>	0	0	1	-	-
70	11.5	Conservation Areas	0	0	0	-	-
70	11.6	Scheduled Ancient Monuments	0	0	0	-	-
70	11.7	<u>Registered Parks and Gardens</u>	0	0	1	-	-
Page	Section	Agricultural designations	On site	0-50m	50-250m	250-500m	500-2000m
71	12.1	<u>Agricultural Land Classification</u>	Grade 2 (within 250m)				
72	12.2	Open Access Land	0	0	0	-	-
72	12.3	Tree Felling Licences	0	0	0	-	-
72	12.4	Environmental Stewardship Schemes	0	0	0	-	-
72	12.5	Countryside Stewardship Schemes	0	0	0	-	-
Page	Section	Habitat designations	On site	0-50m	50-250m	250-500m	500-2000m
73	13.1	Priority Habitat Inventory	0	0	0	-	-
73	13.2	Habitat Networks	0	0	0	-	-
73	13.3	Open Mosaic Habitat	0	0	0	-	-
73	13.4	Limestone Pavement Orders	0	0	0	-	-
Page	Section	Geology 1:10,000 scale	On site	0-50m	50-250m	250-500m	500-2000m
74	14.1	<u>10k Availability</u>	Identified (within 500m)				
75	14.2	Artificial and made ground (10k)	0	0	0	0	-
76	14.3	Superficial geology (10k)	0	0	0	0	-

76	14.4	Landslip (10k)	0	0	0	0	-
77	14.5	Bedrock geology (10k)	0	0	0	0	-
77	14.6	Bedrock faults and other linear features (10k)	0	0	0	0	-
Page	Section	Geology 1:50,000 scale	On site	0-50m	50-250m	250-500m	500-2000m
78	15.1	<u>50k Availability</u>	Identified (within 500m)				
79	15.2	Artificial and made ground (50k)	0	0	0	0	-
79	15.3	Artificial ground permeability (50k)	0	0	-	-	-
80	15.4	<u>Superficial geology (50k)</u>	1	1	0	3	-
81	15.5	<u>Superficial permeability (50k)</u>	Identified (within 50m)				
81	15.6	Landslip (50k)	0	0	0	0	-
81	15.7	Landslip permeability (50k)	None (within 50m)				
82	15.8	<u>Bedrock geology (50k)</u>	1	0	0	0	-
83	15.9	<u>Bedrock permeability (50k)</u>	Identified (within 50m)				
83	15.10	Bedrock faults and other linear features (50k)	0	0	0	0	-
Page	Section	Boreholes	On site	0-50m	50-250m	250-500m	500-2000m
84	16.1	<u>BGS Boreholes</u>	0	0	1	-	-
Page	Section	Natural ground subsidence					
85	17.1	<u>Shrink swell clays</u>	Very low (within 50m)				
86	17.2	<u>Running sands</u>	Very low (within 50m)				
87	17.3	<u>Compressible deposits</u>	Negligible (within 50m)				
88	17.4	<u>Collapsible deposits</u>	Very low (within 50m)				
89	17.5	<u>Landslides</u>	Very low (within 50m)				
90	17.6	<u>Ground dissolution of soluble rocks</u>	Low (within 50m)				
Page	Section	Mining, ground workings and natural cavities	On site	0-50m	50-250m	250-500m	500-2000m
92	18.1	Natural cavities	0	0	0	0	-
93	18.2	BritPits	0	0	0	0	-
93	18.3	<u>Surface ground workings</u>	8	1	23	-	-
94	18.4	Underground workings	0	0	0	0	0
94	18.5	Historical Mineral Planning Areas	0	0	0	0	-



95	18.6	Non-coal mining	0	0	0	0	0
95	18.7	Mining cavities	0	0	0	0	0
95	18.8	JPB mining areas	None (within 0m)				
95	18.9	Coal mining	None (within 0m)				
95	18.10	Brine areas	None (within 0m)				
96	18.11	Gypsum areas	None (within 0m)				
96	18.12	Tin mining	None (within 0m)				
96	18.13	Clay mining	None (within 0m)				
Page	Section	Radon					
97	19.1	<u>Radon</u>	Less than 1% (within 0m)				
Page	Section	Soil chemistry	On site	0-50m	50-250m	250-500m	500-2000m
98	20.1	<u>BGS Estimated Background Soil Chemistry</u>	2	1	-	-	-
98	20.2	BGS Estimated Urban Soil Chemistry	0	0	-	-	-
98	20.3	BGS Measured Urban Soil Chemistry	0	0	-	-	-
Page	Section	Railway infrastructure and projects	On site	0-50m	50-250m	250-500m	500-2000m
99	21.1	Underground railways (London)	0	0	0	-	-
99	21.2	Underground railways (Non-London)	0	0	0	-	-
99	21.3	Railway tunnels	0	0	0	-	-
99	21.4	Historical railway and tunnel features	0	0	0	-	-
99	21.5	Royal Mail tunnels	0	0	0	-	-
100	21.6	Historical railways	0	0	0	-	-
100	21.7	Railways	0	0	0	-	-
100	21.8	Crossrail 1	0	0	0	0	-
100	21.9	Crossrail 2	0	0	0	0	-
100	21.10	HS2	0	0	0	0	-

Recent aerial photograph



Aerial photography supplied by Getmapping PLC. © Copyright Getmapping PLC 2022. All Rights Reserved.

Capture Date: 10/04/2020

Site Area: 0.03ha



Recent site history - 2018 aerial photograph



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Capture Date: 10/10/2018

Site Area: 0.03ha



Recent site history - 2013 aerial photograph



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Capture Date: 14/07/2013

Site Area: 0.03ha



Recent site history - 2009 aerial photograph



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Capture Date: 01/06/2009

Site Area: 0.03ha



Recent site history - 2000 aerial photograph



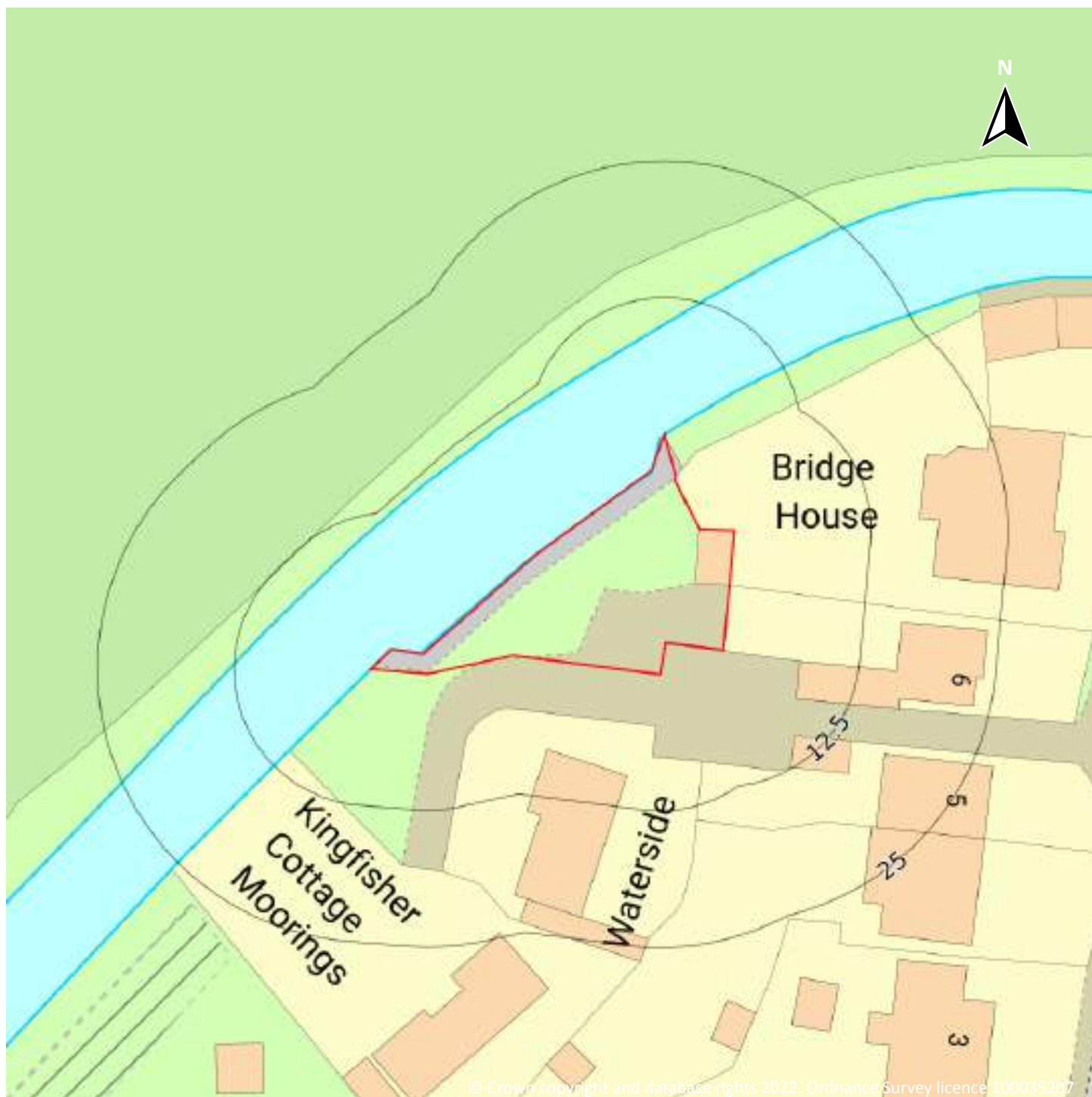
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Capture Date: 25/08/2000

Site Area: 0.03ha



OS MasterMap site plan

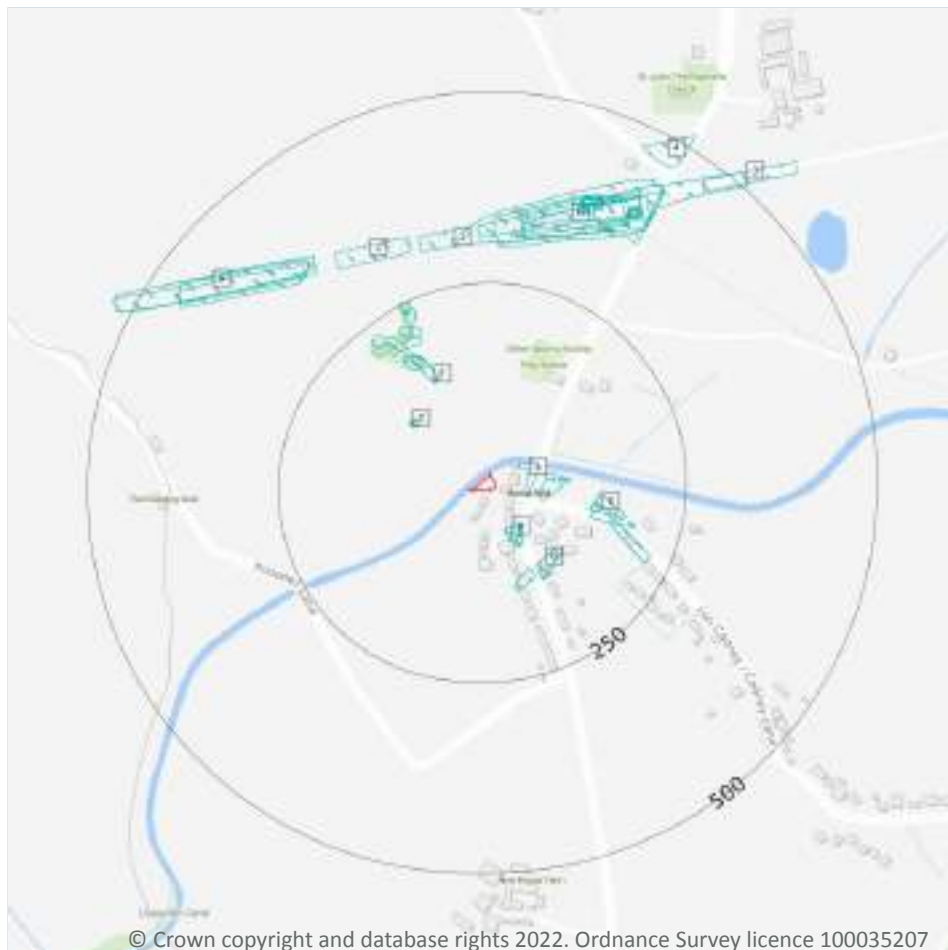


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Site Area: 0.03ha



1 Past land use



— Site Outline
Search buffers in metres (m)
Historical industrial land uses

1.1 Historical industrial land uses

Records within 500m

60

Potentially contaminative land use features digitised from historical Ordnance Survey mapping at 1:10,000 and 1:10,560 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on **page 14**

ID	Location	Land use	Dates present	Group ID
A	36m NE	Unspecified Wharf	1978	826554



ID	Location	Land use	Dates present	Group ID
B	51m SE	Smithy	1949	849119
B	55m SE	Smithy	1899 - 1915	905129
A	59m E	Unspecified Pit	1915	838189
B	62m SE	Smithy	1873	902481
A	68m E	Unspecified Wharf	1873	826553
A	83m E	Lime Kilns	1873	805550
A	83m E	Unspecified Tanks	1898	814850
C	108m NW	Unspecified Pits	1899	917277
D	110m SE	Smithy	1915	871952
D	110m SE	Smithy	1898	954233
C	111m NW	Unspecified Pits	1915	890718
C	111m NW	Unspecified Pits	1898	926158
D	112m SE	Telephone Exchange	1949 - 1978	895183
E	128m E	Smithy	1898	849853
E	128m E	Smithy	1915	979197
E	131m E	Smithy	1915	915257
F	139m NW	Unspecified Pits	1899	966964
F	140m NW	Unspecified Pits	1929	925095
F	140m NW	Unspecified Pits	1898	962098
F	140m NW	Unspecified Pits	1915	987304
E	156m E	Smithy	1949	920789
F	162m NW	Unspecified Pits	1949	983730
F	165m NW	Unspecified Pits	1978	906402
E	180m E	Smithy	1899	843018
F	194m NW	Unspecified Pits	1915	849697
F	235m NW	Unspecified Pits	1978	972885
G	299m N	Railway Sidings	1915	877218
1	301m N	Railway Building	1898	819188

ID	Location	Land use	Dates present	Group ID
G	301m N	Railway Sidings	1898	868241
2	308m N	Cuttings	1978	795187
G	309m N	Railway Sidings	1929 - 1949	943389
G	309m N	Railway Sidings	1873	930240
G	309m N	Railway Sidings	1899	872973
G	311m N	Railway Sidings	1915	889885
G	314m N	Railway Sidings	1929	884479
H	348m NW	Cuttings	1978	871555
H	349m NW	Cuttings	1915	931087
G	351m NE	Railway Building	1898	958417
G	353m NE	Railway Building	1949	989907
H	355m NW	Cuttings	1929 - 1949	921327
H	358m NW	Cuttings	1873	920468
G	362m N	Railway Building	1915	972125
G	363m N	Railway Station	1899 - 1915	976206
G	365m N	Railway Station	1929	962174
G	366m N	Railway Station	1929 - 1949	938555
G	368m NE	Cuttings	1929 - 1949	885611
G	370m N	Railway Building	1898	875498
G	373m N	Railway Station	1873	937678
G	380m NE	Railway Building	1949	859461
G	380m NE	Railway Building	1898	932470
G	380m NE	Railway Building	1915	954141
G	381m NE	Railway Building	1929	889586
G	381m NE	Railway Building	1929	935090
G	381m NE	Railway Building	1899	977309
G	389m NE	Railway Building	1915	873432
G	389m NE	Railway Building	1898	933264



ID	Location	Land use	Dates present	Group ID
G	390m NE	Railway Building	1929	949416
3	463m NE	Cuttings	1873	795186
4	463m NE	Unspecified Pit	1929	916076

This data is sourced from Ordnance Survey / Groundsure.

1.2 Historical tanks

Records within 500m

0

Tank features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original ungrouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

This data is sourced from Ordnance Survey / Groundsure.

1.3 Historical energy features

Records within 500m

0

Energy features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original ungrouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

This data is sourced from Ordnance Survey / Groundsure.

1.4 Historical petrol stations

Records within 500m

0

Petrol stations digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original ungrouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

This data is sourced from Ordnance Survey / Groundsure.



1.5 Historical garages

Records within 500m

0

Garages digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original ungrouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

This data is sourced from Ordnance Survey / Groundsure.

1.6 Historical military land

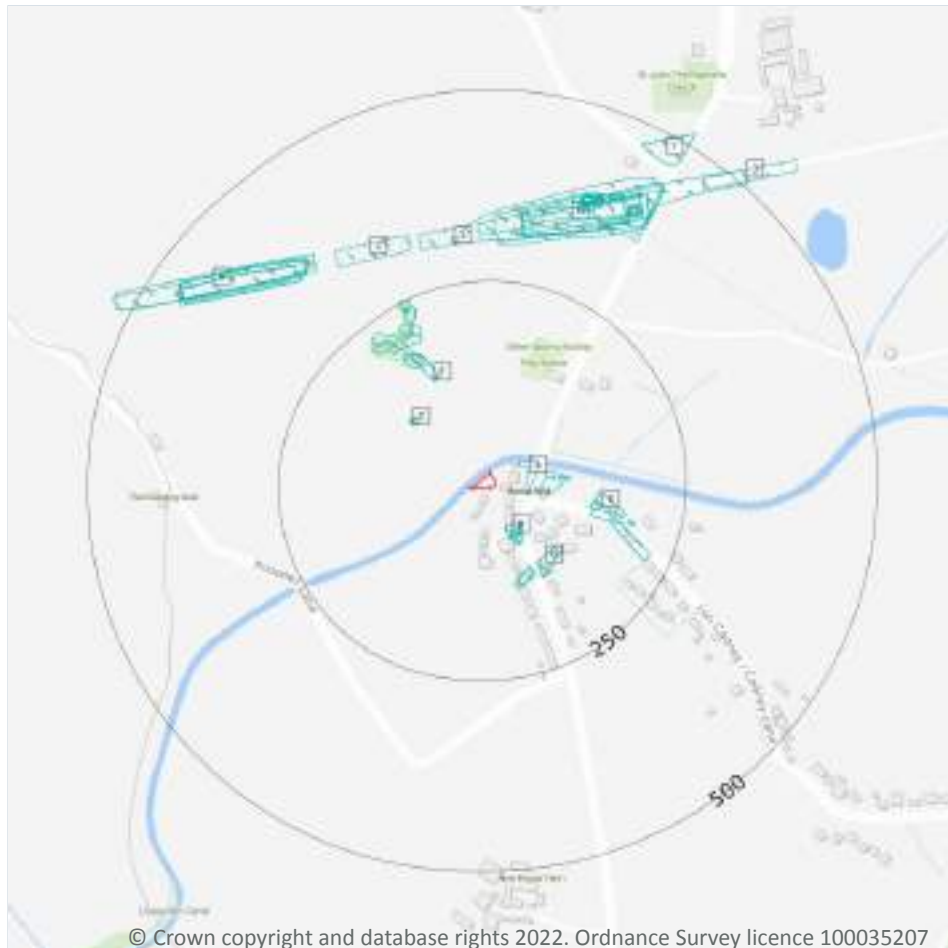
Records within 500m

0

Areas of military land digitised from multiple sources including the National Archives, local records, MOD records and verified other sources, intelligently grouped into contiguous features.

This data is sourced from Ordnance Survey / Groundsure / other sources.

2 Past land use - un-grouped



— Site Outline
Search buffers in metres (m)
 Historical industrial land uses

2.1 Historical industrial land uses

Records within 500m

71

Potentially contaminative land use features digitised from historical Ordnance Survey mapping at 1:10,000 and 10,560 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on **page 19**

ID	Location	Land Use	Date	Group ID
A	36m NE	Unspecified Wharf	1978	826554
B	51m SE	Smithy	1949	849119
B	55m SE	Smithy	1899	905129

ID	Location	Land Use	Date	Group ID
A	59m E	Unspecified Pit	1915	838189
B	62m SE	Smithy	1873	902481
B	62m SE	Smithy	1915	905129
A	68m E	Unspecified Wharf	1873	826553
A	83m E	Unspecified Tanks	1898	814850
A	83m E	Lime Kilns	1873	805550
C	108m NW	Unspecified Pits	1899	917277
D	110m SE	Smithy	1915	871952
D	110m SE	Smithy	1898	954233
C	111m NW	Unspecified Pits	1915	890718
C	111m NW	Unspecified Pits	1898	926158
D	112m SE	Telephone Exchange	1949	895183
D	116m SE	Telephone Exchange	1978	895183
E	128m E	Smithy	1915	979197
E	128m E	Smithy	1898	849853
E	131m E	Smithy	1915	915257
F	139m NW	Unspecified Pits	1899	966964
F	140m NW	Unspecified Pits	1929	925095
F	140m NW	Unspecified Pits	1915	987304
F	140m NW	Unspecified Pits	1898	962098
E	156m E	Smithy	1949	920789
F	162m NW	Unspecified Pits	1949	983730
F	165m NW	Unspecified Pits	1978	906402
E	180m E	Smithy	1899	843018
F	194m NW	Unspecified Pits	1915	849697
F	194m NW	Unspecified Pits	1915	849697
F	235m NW	Unspecified Pits	1978	972885
G	299m N	Railway Sidings	1915	877218



ID	Location	Land Use	Date	Group ID
1	301m N	Railway Building	1898	819188
G	301m N	Railway Sidings	1898	868241
2	308m N	Cuttings	1978	795187
G	309m N	Railway Sidings	1929	943389
G	309m N	Railway Sidings	1873	930240
G	309m N	Railway Sidings	1899	872973
G	310m N	Railway Sidings	1949	943389
G	311m N	Railway Sidings	1915	889885
G	314m N	Railway Sidings	1929	884479
H	348m NW	Cuttings	1978	871555
H	349m NW	Cuttings	1915	931087
H	351m NW	Cuttings	1915	931087
G	351m NE	Railway Building	1898	958417
G	353m NE	Railway Building	1949	989907
H	355m NW	Cuttings	1929	921327
H	356m NW	Cuttings	1929	921327
H	358m NW	Cuttings	1949	921327
H	358m NW	Cuttings	1873	920468
G	362m N	Railway Building	1915	972125
G	363m N	Railway Station	1915	976206
G	365m N	Railway Station	1929	962174
G	366m N	Railway Station	1929	938555
G	368m NE	Cuttings	1949	885611
G	369m NE	Cuttings	1929	885611
G	369m N	Railway Station	1899	976206
G	370m N	Railway Building	1898	875498
G	371m N	Railway Station	1949	938555
G	373m N	Railway Station	1873	937678



ID	Location	Land Use	Date	Group ID
G	380m NE	Railway Building	1915	954141
G	380m NE	Railway Building	1898	932470
G	380m NE	Railway Building	1949	859461
G	381m NE	Railway Building	1929	889586
G	381m NE	Railway Building	1929	935090
G	381m NE	Railway Building	1899	977309
G	389m NE	Railway Building	1915	873432
G	389m NE	Railway Building	1898	933264
G	390m NE	Railway Building	1929	949416
3	463m NE	Cuttings	1873	795186
I	463m NE	Unspecified Pit	1929	916076
I	463m NE	Unspecified Pit	1929	916076

This data is sourced from Ordnance Survey / Groundsure.

2.2 Historical tanks

Records within 500m

0

Tank features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

This data is sourced from Ordnance Survey / Groundsure.

2.3 Historical energy features

Records within 500m

0

Energy features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

This data is sourced from Ordnance Survey / Groundsure.



2.4 Historical petrol stations

Records within 500m	0
---------------------	---

Petrol stations digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

This data is sourced from Ordnance Survey / Groundsure.

2.5 Historical garages

Records within 500m	0
---------------------	---

Garages digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

This data is sourced from Ordnance Survey / Groundsure.



3 Waste and landfill



- Site Outline
- Search buffers in metres (m)
- Waste exemptions

3.1 Active or recent landfill

Records within 500m

0

Active or recently closed landfill sites under Environment Agency/Natural Resources Wales regulation.

This data is sourced from the Environment Agency and Natural Resources Wales.

3.2 Historical landfill (BGS records)

Records within 500m

0

Landfill sites identified on a survey carried out on behalf of the DoE in 1973. These sites may have been closed or operational at this time.

This data is sourced from the British Geological Survey.

3.3 Historical landfill (LA/mapping records)

Records within 500m**0**

Landfill sites identified from Local Authority records and high detail historical mapping.

This data is sourced from the Ordnance Survey/Groundsure and Local Authority records.

3.4 Historical landfill (EA/NRW records)

Records within 500m**0**

Known historical (closed) landfill sites (e.g. sites where there is no PPC permit or waste management licence currently in force). This includes sites that existed before the waste licensing regime and sites that have been licensed in the past but where a licence has been revoked, ceased to exist or surrendered and a certificate of completion has been issued.

This data is sourced from the Environment Agency and Natural Resources Wales.

3.5 Historical waste sites

Records within 500m**0**

Waste site records derived from Local Authority planning records and high detail historical mapping.

This data is sourced from Ordnance Survey/Groundsure and Local Authority records.

3.6 Licensed waste sites

Records within 500m**0**

Active or recently closed waste sites under Environment Agency/Natural Resources Wales regulation.

This data is sourced from the Environment Agency and Natural Resources Wales.

3.7 Waste exemptions

Records within 500m**9**

Activities involving the storage, treatment, use or disposal of waste that are exempt from needing a permit. Exemptions have specific limits and conditions that must be adhered to.

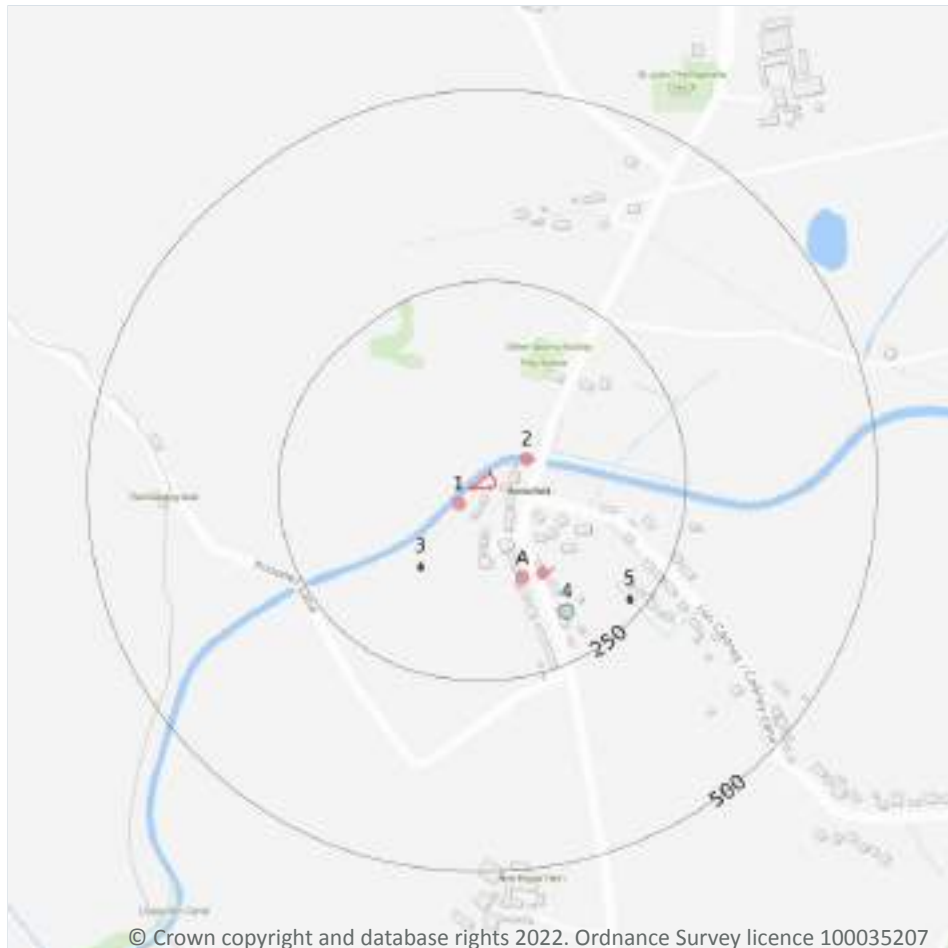
Features are displayed on the Waste and landfill map on **page 24**

ID	Location	Site	Reference	Category	Sub-Category	Description
A	114m SE	J R Marsh & Son, New House Farm, Bettisfield, Whitchurch, Shropshire, SY132LJ	NRW-WME022379	Disposing of waste exemption	On a farm	Deposit of waste from dredging of inland waters
A	114m SE	J R Marsh & Son, New House Farm, Bettisfield, Whitchurch, Shropshire, SY132LJ	NRW-WME022379	Storing waste exemption	On a farm	Storage of waste in a secure place
A	114m SE	J R Marsh & Son, New House Farm, Bettisfield, Whitchurch, Shropshire, SY132LJ	NRW-WME022379	Using waste exemption	On a farm	Use of mulch
A	114m SE	J R Marsh & Son, New House Farm, Bettisfield, Whitchurch, Shropshire, SY132LJ	NRW-WME022379	Disposing of waste exemption	On a farm	Burning waste in the open
A	114m SE	J R Marsh & Son, New House Farm, Bettisfield, Whitchurch, Shropshire, SY132LJ	NRW-WME022379	Using waste exemption	On a farm	Use of waste in construction
A	114m SE	J R Marsh & Son, New House Farm, Bettisfield, Whitchurch, Shropshire, SY132LJ	NRW-WME022379	Using waste exemption	On a farm	Spreading waste on agricultural land to confer benefit
A	114m SE	J R Marsh & Son, New House Farm, Bettisfield, Whitchurch, Shropshire, SY132LJ	NRW-WME022379	Using waste exemption	On a farm	Spreading of plant matter to confer benefit
A	114m SE	J R Marsh & Son, New House Farm, Bettisfield, Whitchurch, Shropshire, SY132LJ	NRW-WME022379	Treating waste exemption	On a farm	Aerobic composting and associated prior treatment
1	454m E	-	WEX157282	Treating waste exemption	On a Farm	Screening and blending of waste

This data is sourced from the Environment Agency and Natural Resources Wales.



4 Current industrial land use



- Site Outline
- Search buffers in metres (m)
- Recent industrial land uses
- Licensed Discharges to controlled waters
- Pollution Incidents (EA/NRW)

4.1 Recent industrial land uses

Records within 250m

4

Current potentially contaminative industrial sites.

Features are displayed on the Current industrial land use map on **page 27**

ID	Location	Company	Address	Activity	Category
1	25m SW	Moorings	Clwyd, SY13	Moorings and Unloading Facilities	Water
2	49m NE	Wharf	Clwyd, SY13	Moorings and Unloading Facilities	Water
A	124m S	Telephone Exchange	Clwyd, SY13	Telecommunications Features	Infrastructure and Facilities



ID	Location	Company	Address	Activity	Category
A	128m SE	Bettisfield Boats	The Cottage, Bettisfield, Whitchurch, Clwyd, SY13 2LJ	Boat Hiring Services	Hire Services

This data is sourced from Ordnance Survey.

4.2 Current or recent petrol stations

Records within 500m	0
----------------------------	----------

Open, closed, under development and obsolete petrol stations.

This data is sourced from Experian.

4.3 Electricity cables

Records within 500m	0
----------------------------	----------

High voltage underground electricity transmission cables.

This data is sourced from National Grid.

4.4 Gas pipelines

Records within 500m	0
----------------------------	----------

High pressure underground gas transmission pipelines.

This data is sourced from National Grid.

4.5 Sites determined as Contaminated Land

Records within 500m	0
----------------------------	----------

Contaminated Land Register of sites designated under Part 2a of the Environmental Protection Act 1990.

This data is sourced from Local Authority records.

4.6 Control of Major Accident Hazards (COMAH)

Records within 500m	0
----------------------------	----------

Control of Major Accident Hazards (COMAH) sites. This data includes upper and lower tier sites, and includes a historical archive of COMAH sites and Notification of Installations Handling Hazardous Substances (NIHHS) records.

This data is sourced from the Health and Safety Executive.

4.7 Regulated explosive sites

Records within 500m**0**

Sites registered and licensed by the Health and Safety Executive under the Manufacture and Storage of Explosives Regulations 2005 (MSER). The last update to this data was in April 2011.

This data is sourced from the Health and Safety Executive.

4.8 Hazardous substance storage/usage

Records within 500m**0**

Consents granted for a site to hold certain quantities of hazardous substances at or above defined limits in accordance with the Planning (Hazardous Substances) Regulations 2015.

This data is sourced from Local Authority records.

4.9 Historical licensed industrial activities (IPC)

Records within 500m**0**

Integrated Pollution Control (IPC) records of substance releases to air, land and water. This data represents a historical archive as the IPC regime has been superseded.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.10 Licensed industrial activities (Part A(1))

Records within 500m**0**

Records of Part A(1) installations regulated under the Environmental Permitting (England and Wales) Regulations 2016 for the release of substances to the environment.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.11 Licensed pollutant release (Part A(2)/B)

Records within 500m**0**

Records of Part A(2) and Part B installations regulated under the Environmental Permitting (England and Wales) Regulations 2016 for the release of substances to the environment.

This data is sourced from Local Authority records.

4.12 Radioactive Substance Authorisations

Records within 500m

0

Records of the storage, use, accumulation and disposal of radioactive substances regulated under the Radioactive Substances Act 1993.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.13 Licensed Discharges to controlled waters

Records within 500m

2

Discharges of treated or untreated effluent to controlled waters under the Water Resources Act 1991.

Features are displayed on the Current industrial land use map on **page 27**

ID	Location	Address	Details	
3	120m SW	1234 & 5 CANAL PADDOCKS &, SMITHY HOUSE, Bettisfield, NR WHITCHURCH, SHROPSHIRE, SY13 2LX	Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY Permit Number: PP3629GH Permit Version: 1 Receiving Water: Groundwater via infiltration system	Status: Effective Issue date: 07/12/2011 Effective Date: 07/12/2011 Revocation Date: -
5	229m SE	3 PROPERTIES AT CADNEY LANE, BETTISFIELD, WREXHAM, WALES, SY13 2LU	Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY Permit Number: GP3526GW Permit Version: 1 Receiving Water: TRIB OF RIVER RODEN	Status: Effective Issue date: 15/04/2011 Effective Date: 15/04/2011 Revocation Date: -

This data is sourced from the Environment Agency and Natural Resources Wales.

4.14 Pollutant release to surface waters (Red List)

Records within 500m

0

Discharges of specified substances under the Environmental Protection (Prescribed Processes and Substances) Regulations 1991.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.15 Pollutant release to public sewer

Records within 500m

0

Discharges of Special Category Effluents to the public sewer.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.16 List 1 Dangerous Substances

Records within 500m

0

Discharges of substances identified on List I of European Directive E 2006/11/EC, and regulated under the Environmental Damage (Prevention and Remediation) Regulations 2015.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.17 List 2 Dangerous Substances

Records within 500m

0

Discharges of substances identified on List II of European Directive E 2006/11/EC, and regulated under the Environmental Damage (Prevention and Remediation) Regulations 2015.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.18 Pollution Incidents (EA/NRW)

Records within 500m

1

Records of substantiated pollution incidents. Since 2006 this data has only included category 1 (major) and 2 (significant) pollution incidents.

Features are displayed on the Current industrial land use map on **page 27**

ID	Location	Details	
4	188m SE	Incident Date: 15/07/2014 Incident Identification: 1256194 Pollutant: Specific Waste Materials Pollutant Description: Commercial Waste	Water Impact: - Land Impact: Category 4 (No Impact) Air Impact: Category 3 (Minor)

This data is sourced from the Environment Agency and Natural Resources Wales.

4.19 Pollution inventory substances

Records within 500m**0**

The pollution inventory (substances) includes reporting on annual emissions of certain regulated substances to air, controlled waters and land. A reporting threshold for each substance is also included. Where emissions fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.

4.20 Pollution inventory waste transfers

Records within 500m**0**

The pollution inventory (waste transfers) includes reporting on annual transfers and recovery/disposal of controlled wastes from a site. A reporting threshold for each waste type is also included. Where releases fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.

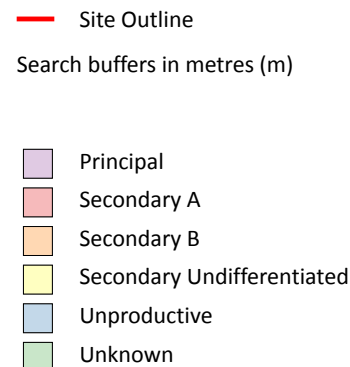
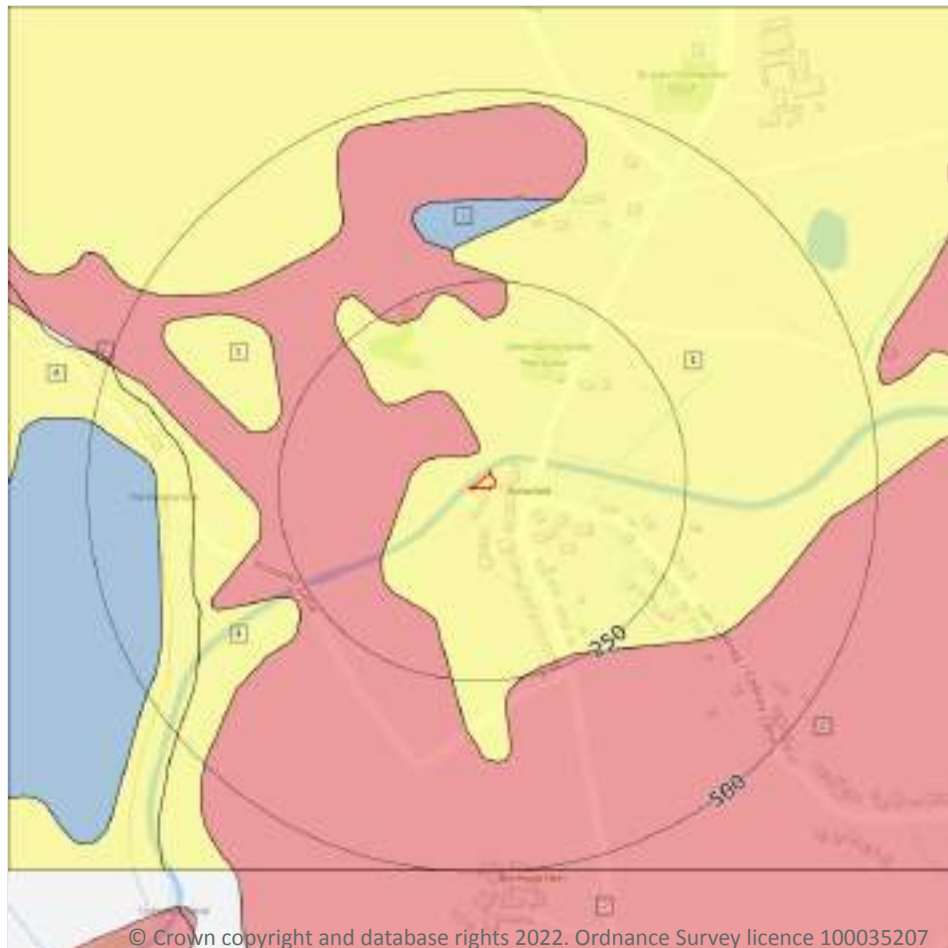
4.21 Pollution inventory radioactive waste

Records within 500m**0**

The pollution inventory (radioactive wastes) includes reporting on annual releases of radioactive substances from a site, including the means of release. Where releases fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.

5 Hydrogeology - Superficial aquifer



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5.1 Superficial aquifer

Records within 500m

9

Aquifer status of groundwater held within superficial geology.

Features are displayed on the Hydrogeology map on **page 33**

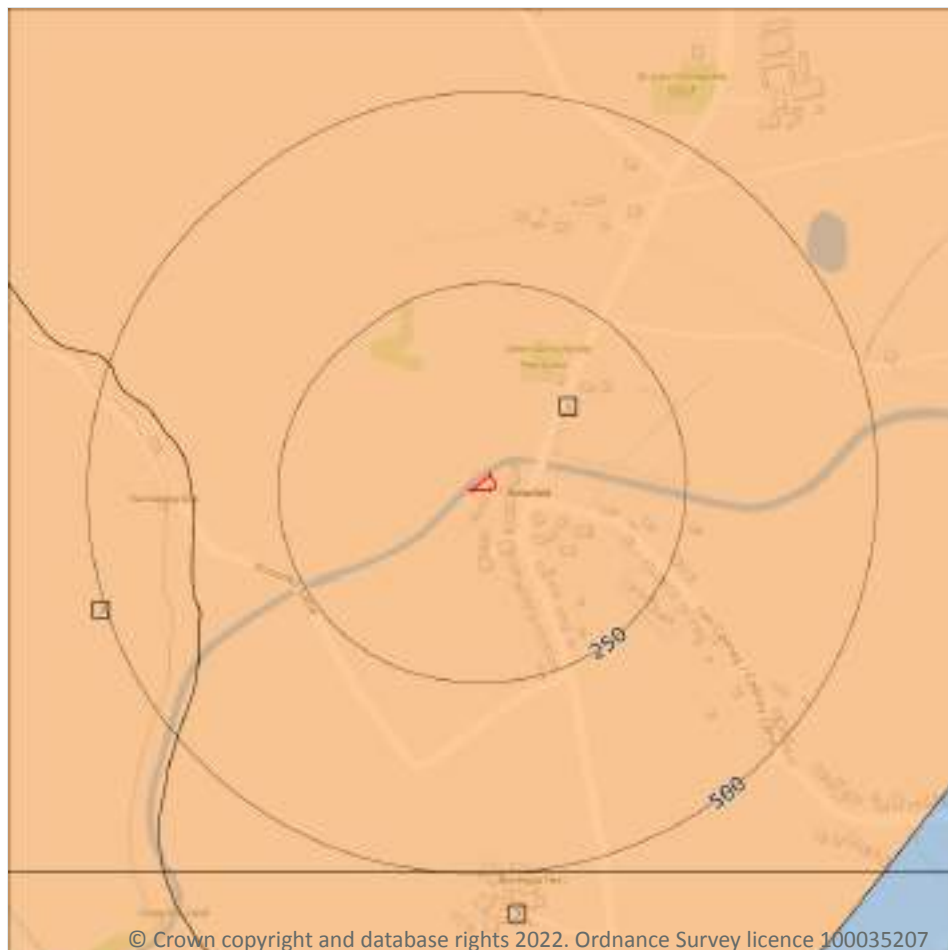
ID	Location	Designation	Description
1	On site	Secondary Undifferentiated	Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type
2	30m NW	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers

ID	Location	Designation	Description
3	265m W	Secondary Undifferentiated	Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type
4	270m SW	Secondary Undifferentiated	Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type
5	294m N	Unproductive	These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow
A	361m W	Secondary Undifferentiated	Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type
A	410m W	Unproductive	These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow
6	494m W	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
7	499m S	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers

This data is sourced from the British Geological Survey, the Environment Agency and Natural Resources Wales.



Bedrock aquifer



- Site Outline
- Search buffers in metres (m)
- Principal
- Secondary A
- Secondary B
- Secondary Undifferentiated
- Unproductive

5.2 Bedrock aquifer

Records within 500m

3

Aquifer status of groundwater held within bedrock geology.

Features are displayed on the Bedrock aquifer map on **page 35**

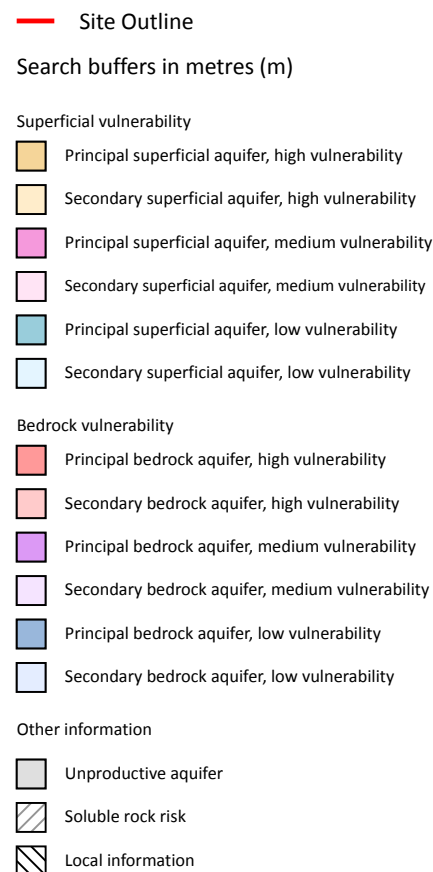
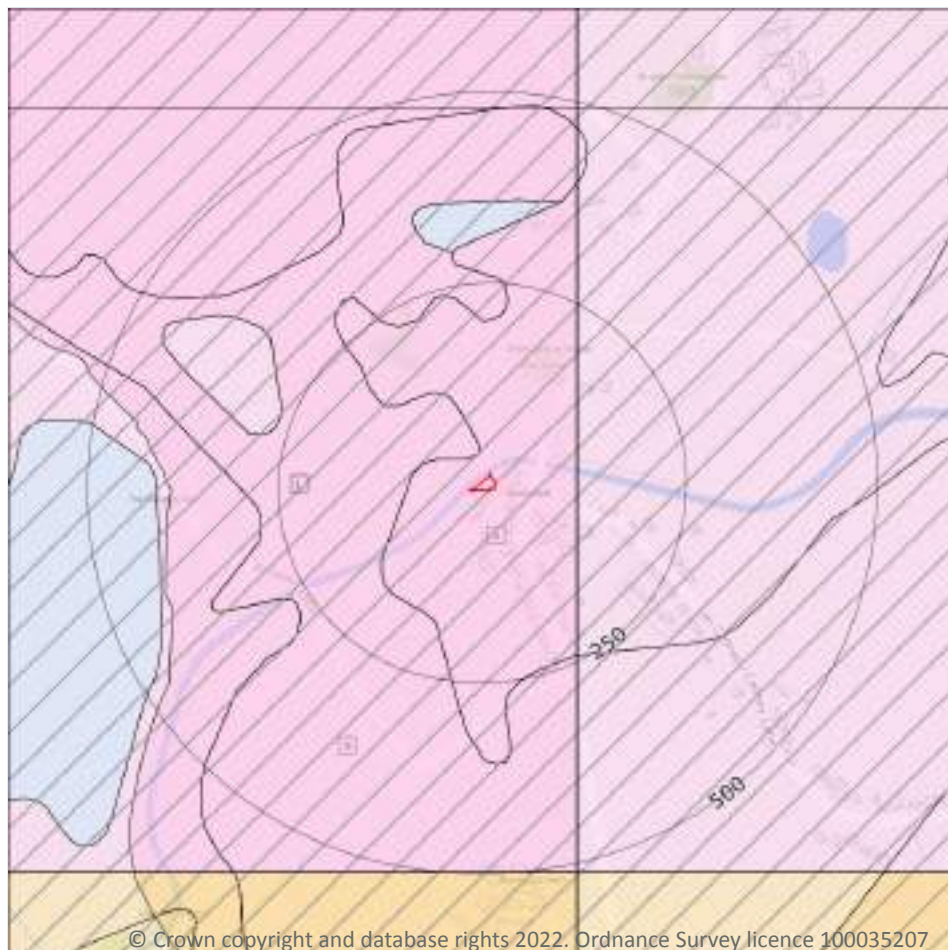
ID	Location	Designation	Description
1	On site	Secondary B	Predominantly lower permeability layers which may store/yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers
2	361m W	Secondary B	Predominantly lower permeability layers which may store/yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers

ID	Location	Designation	Description
3	499m S	Secondary B	Predominantly lower permeability layers which may store/yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers

This data is sourced from the British Geological Survey, the Environment Agency and Natural Resources Wales.



Groundwater vulnerability



5.3 Groundwater vulnerability

Records within 50m

4

An assessment of the vulnerability of groundwater to a pollutant discharged at ground level based on the hydrological, geological, hydrogeological and soil properties within a one kilometre square grid. Groundwater vulnerability is described as High, Medium or Low as follows:

- High - Areas able to easily transmit pollution to groundwater. They are likely to be characterised by high leaching soils and the absence of low permeability superficial deposits.
- Medium - Intermediate between high and low vulnerability.
- Low - Areas that provide the greatest protection from pollution. They are likely to be characterised by low leaching soils and/or the presence of superficial deposits characterised by a low permeability.

Features are displayed on the Groundwater vulnerability map on **page 37**

ID	Location	Summary	Soil / surface	Superficial geology	Bedrock geology
A	On site	Summary Classification: Secondary superficial aquifer - Medium Vulnerability Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer	Leaching class: Low Infiltration value: <40% Dilution value: <300mm/year	Vulnerability: Medium Aquifer type: Secondary Thickness: >10m Patchiness value: >90% Recharge potential: Low	Vulnerability: Low Aquifer type: Secondary Flow mechanism: Well connected fractures
A	On site	Summary Classification: Secondary superficial aquifer - Medium Vulnerability Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer	Leaching class: Low Infiltration value: <40% Dilution value: <300mm/year	Vulnerability: Medium Aquifer type: Secondary Thickness: >10m Patchiness value: >90% Recharge potential: Low	Vulnerability: Low Aquifer type: Secondary Flow mechanism: Well connected fractures
B	30m NW	Summary Classification: Secondary superficial aquifer - Medium Vulnerability Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer	Leaching class: Low Infiltration value: <40% Dilution value: <300mm/year	Vulnerability: Medium Aquifer type: Secondary Thickness: >10m Patchiness value: >90% Recharge potential: Low	Vulnerability: Low Aquifer type: Secondary Flow mechanism: Well connected fractures
B	30m NW	Summary Classification: Secondary superficial aquifer - Medium Vulnerability Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer	Leaching class: Low Infiltration value: <40% Dilution value: <300mm/year	Vulnerability: Medium Aquifer type: Secondary Thickness: >10m Patchiness value: >90% Recharge potential: Low	Vulnerability: Low Aquifer type: Secondary Flow mechanism: Well connected fractures

This data is sourced from the British Geological Survey, the Environment Agency and Natural Resources Wales.

5.4 Groundwater vulnerability- soluble rock risk

Records on site

1

This dataset identifies areas where solution features that enable rapid movement of a pollutant may be present within a 1km grid square.

ID	Maximum soluble risk category	Percentage of grid square covered by maximum risk
1	Significant soluble rocks are likely to be present. Low possibility of localised subsidence or dissolution-related degradation of bedrock occurring naturally, but may be possible in adverse conditions such as high surface or subsurface water flow.	100.0%

This data is sourced from the British Geological Survey and the Environment Agency.



5.5 Groundwater vulnerability- local information

Records on site

0

This dataset identifies areas where additional local information affecting vulnerability is held by the Environment Agency. Further information can be obtained by contacting the Environment Agency local Area groundwater team through the Environment Agency National Customer Call Centre on 03798 506 506 or by email on enquiries@environment-agency.gov.uk.

This data is sourced from the British Geological Survey and the Environment Agency.



Abstractions and Source Protection Zones



- Site Outline
- Search buffers in metres (m)
- Source Protection Zone 1
Inner catchment
- Source Protection Zone 2
Outer catchment
- Source Protection Zone 3
Total catchment
- Source Protection Zone 4
Zone of Special Interest
- Source Protection Zone 1c
Inner catchment - confined aquifer
- Source Protection Zone 2c
Outer catchment - confined aquifer
- Source Protection Zone 3c
Total catchment - confined aquifer
- Drinking water abstraction licences
Polygon features
- Drinking water abstraction licences
Linear features
- Groundwater abstraction licence (point)
- Groundwater abstraction licence (area)
- Groundwater abstraction licence (linear)
- Surface Water Abstractions (point)
- Surface Water Abstractions (area)
- Surface Water Abstractions (linear)

5.6 Groundwater abstractions

Records within 2000m

5

Licensed groundwater abstractions for sites extracting more than 20 cubic metres of water a day and includes active and historical records. The data may be for a single abstraction point, between two points (line data) or a larger area.

Features are displayed on the Abstractions and Source Protection Zones map on **page 40**

ID	Location	Details	
1	617m NE	Status: Historical Licence No: 18/54/04/1320 Details: General Farming & Domestic Direct Source: Groundwater Midlands Region Point: BETTISFIELD HALL FARM - WELL Data Type: Point Name: PARKER Easting: 346320 Northing: 335960	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 19/02/1993 Expiry Date: - Issue No: 100 Version Start Date: 19/02/1993 Version End Date: -
-	927m E	Status: Historical Licence No: 18/54/04/0791 Details: General Farming & Domestic Direct Source: Groundwater Midlands Region Point: CORNHILL FARM -WELL Data Type: Point Name: KYNASTON Easting: 346800 Northing: 335700	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 02/02/1967 Expiry Date: - Issue No: 100 Version Start Date: 05/11/1974 Version End Date: -
-	1305m NW	Status: Historical Licence No: 18/54/04/0244 Details: General Farming & Domestic Direct Source: Groundwater Midlands Region Point: CORNER FARM, WELSHAMPTON - WELL Data Type: Point Name: HOPLEY Easting: 344700 Northing: 336100	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: 25/01/1966 Expiry Date: - Issue No: 100 Version Start Date: 24/06/1994 Version End Date: -
-	1701m NE	Status: Historical Licence No: 18/54/04/0711 Details: General Farming & Domestic Direct Source: Groundwater Midlands Region Point: CAMBRIAN COTTAGE - WELL 3 Data Type: Point Name: LINDSAY Easting: 347400 Northing: 336300	Annual Volume (m ³): 331.858 Max Daily Volume (m ³): 331.858 Original Application No: - Original Start Date: 26/10/1966 Expiry Date: - Issue No: 100 Version Start Date: 26/10/1966 Version End Date: -
-	1836m NE	Status: Historical Licence No: 18/54/04/0711 Details: General Farming & Domestic Direct Source: Groundwater Midlands Region Point: CAMBRIAN COTTAGE - WELL 2 Data Type: Point Name: LINDSAY Easting: 347500 Northing: 336400	Annual Volume (m ³): 331.858 Max Daily Volume (m ³): 331.858 Original Application No: - Original Start Date: 26/10/1966 Expiry Date: - Issue No: 100 Version Start Date: 26/10/1966 Version End Date: -

This data is sourced from the Environment Agency and Natural Resources Wales.



5.7 Surface water abstractions

Records within 2000m

2

Licensed surface water abstractions for sites extracting more than 20 cubic metres of water a day and includes active and historical records. The data may be for a single abstraction point, a stretch of watercourse or a larger area.

Features are displayed on the Abstractions and Source Protection Zones map on **page 40**

ID	Location	Details	
-	1373m E	Status: Historical Licence No: 18/54/04/1262 Details: Spray Irrigation - Direct Direct Source: Surface Water Midlands Region Point: CORNHILL,BETTISFIELD - SHROPSHIRE UNION CANAL Data Type: Point Name: Canal and River Trust Easting: 347250 Northing: 335720	Annual Volume (m ³): 72170 Max Daily Volume (m ³): 1140 Original Application No: - Original Start Date: 31/05/1990 Expiry Date: - Issue No: 104 Version Start Date: 04/11/2015 Version End Date: -
-	1373m E	Status: Active Licence No: 18/54/04/1262 Details: Spray Irrigation - Direct - High Direct Source: - Point: - Data Type: Point Name: - Easting: 347250 Northing: 335720	Annual Volume (m ³): 42,170 Max Daily Volume (m ³): - Original Application No: - Original Start Date: Nov 4 2015 12:00AM Expiry Date: - Issue No: - Version Start Date: - Version End Date: -

This data is sourced from the Environment Agency and Natural Resources Wales.

5.8 Potable abstractions

Records within 2000m

0

Licensed potable water abstractions for sites extracting more than 20 cubic metres of water a day and includes active and historical records. The data may be for a single abstraction point, a stretch of watercourse or a larger area.

This data is sourced from the Environment Agency and Natural Resources Wales.



5.9 Source Protection Zones

Records within 500m	0
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Source Protection Zones define the sensitivity of an area around a potable abstraction site to contamination.

This data is sourced from the Environment Agency and Natural Resources Wales.

5.10 Source Protection Zones (confined aquifer)

Records within 500m	0
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Source Protection Zones in the confined aquifer define the sensitivity around a deep groundwater abstraction to contamination. A confined aquifer would normally be protected from contamination by overlying geology and is only considered a sensitive resource if deep excavation/drilling is taking place.

This data is sourced from the Environment Agency and Natural Resources Wales.

6 Hydrology



- Site Outline
- Search buffers in metres (m)
- Water Network (OS MasterMap)
- Surface water features (wider than 5m)
- Surface water features (narrower than 5m)
- ... WFD River, canal and surface water transfer water bodies
- WFD Lake water bodies
- WFD Transitional and coastal water bodies
- WFD Surface water body catchments boundaries
- WFD Groundwater body boundaries

6.1 Water Network (OS MasterMap)

Records within 250m

11

Detailed water network of Great Britain showing the flow and precise central course of every river, stream, lake and canal.

Features are displayed on the Hydrology map on **page 44**

ID	Location	Type of water feature	Ground level	Permanence	Name
B	3m NW	Canal. A manmade watercourse for inland navigation.	On ground surface	Watercourse contains water year round (in normal circumstances)	Llangollen Canal

ID	Location	Type of water feature	Ground level	Permanence	Name
A	83m NE	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
A	120m NE	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
C	125m E	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
C	125m E	Inland river not influenced by normal tidal action.	Underground	Watercourse contains water year round (in normal circumstances)	-
C	127m E	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
D	156m E	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
E	156m E	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
F	205m SE	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
G	217m NE	Lake, loch or reservoir.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
G	220m NE	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-

This data is sourced from the Ordnance Survey.

6.2 Surface water features

Records within 250m

9

Covering rivers, streams and lakes (some overlap with OS MasterMap Water Network data in previous section) but additionally covers smaller features such as ponds. Rivers and streams narrower than 5m are represented as a single line. Lakes, ponds and rivers or streams wider than 5m are represented as polygons.

Features are displayed on the Hydrology map on **page 44**



This data is sourced from the Ordnance Survey.

6.3 WFD Surface water body catchments

Records on site

1

The Water Framework Directive is an EU-led framework for the protection of inland surface waters, estuaries, coastal waters and groundwater through river basin-level management planning. In terms of surface water, these basins are broken down into smaller units known as management, operational and water body catchments.

Features are displayed on the Hydrology map on **page 44**

ID	Location	Type	Water body catchment	Water body ID	Operational catchment	Management catchment
A	On site	River	Tributary - source to conf R Roden	GB109054054980	Perry Roden and Tern North Shropshire	Severn Middle Shropshire

This data is sourced from the Environment Agency and Natural Resources Wales.

6.4 WFD Surface water bodies

Records identified

2

Surface water bodies under the Directive may be rivers, lakes, estuary or coastal. To achieve the purpose of the Directive, environmental objectives have been set and are reported on for each water body. The progress towards delivery of the objectives is then reported on by the relevant competent authorities at the end of each six-year cycle. The river water body directly associated with the catchment listed in the previous section is detailed below, along with any lake, canal, coastal or artificial water body within 250m of the site.

Features are displayed on the Hydrology map on **page 44**

ID	Location	Type	Name	Water body ID	Overall rating	Chemical rating	Ecological rating	Year
B	4m NW	Canal	Llangollen Canal	GB70910082	Moderate	Fail	Good	2019
-	3602m SE	River	Tributary - source to conf R Roden	GB109054054980	Bad	Fail	Bad	2019

This data is sourced from the Environment Agency and Natural Resources Wales.



6.5 WFD Groundwater bodies

Records on site

1

Groundwater bodies are also covered by the Directive and the same regime of objectives and reporting detailed in the previous section is in place.

Features are displayed on the Hydrology map on **page 44**

ID	Location	Name	Water body ID	Overall rating	Chemical rating	Quantitative	Year
1	On site	Shropshire Middle Severn - Secondary Mudrocks and Drift Wem	GB40902G991800	Good	Good	Good	2019

This data is sourced from the Environment Agency and Natural Resources Wales.



7 River and coastal flooding

7.1 Risk of flooding from rivers and the sea

Records within 50m**0**

The chance of flooding from rivers and/or the sea in any given year, based on cells of 50m within the Risk of Flooding from Rivers and Sea (RoFRaS)/Flood Risk Assessment Wales (FRAW) models. Each cell is allocated one of four flood risk categories, taking into account flood defences and their condition. The risk categories for RoFRaS for rivers and the sea and FRAW for rivers are; Very low (less than 1 in 1000 chance in any given year), Low (less than 1 in 100 but greater than or equal to 1 in 1000 chance), Medium (less than 1 in 30 but greater than or equal to 1 in 100 chance) or High (greater than or equal to 1 in 30 chance). The risk categories for FRAW for the sea are; Very low (less than 1 in 1000 chance in any given year), Low (less than 1 in 200 but greater than or equal to 1 in 1000 chance), Medium (less than 1 in 30 but greater than or equal to 1 in 200 chance) or High (greater than or equal to 1 in 30 chance).

This data is sourced from the Environment Agency and Natural Resources Wales.

7.2 Historical Flood Events

Records within 250m**0**

Records of historic flooding from rivers, the sea, groundwater and surface water. Records began in 1946 when predecessor bodies started collecting detailed information about flooding incidents, although limited details may be included on flooding incidents prior to this date. Takes into account the presence of defences, structures, and other infrastructure where they existed at the time of flooding, and includes flood extents that may have been affected by overtopping, breaches or blockages.

This data is sourced from the Environment Agency and Natural Resources Wales.

7.3 Flood Defences

Records within 250m**0**

Records of flood defences owned, managed or inspected by the Environment Agency and Natural Resources Wales. Flood defences can be structures, buildings or parts of buildings. Typically these are earth banks, stone and concrete walls, or sheet-piling that is used to prevent or control the extent of flooding.

This data is sourced from the Environment Agency and Natural Resources Wales.



7.4 Areas Benefiting from Flood Defences

Records within 250m

0

Areas that would benefit from the presence of flood defences in a 1 in 100 (1%) chance of flooding each year from rivers or 1 in 200 (0.5%) chance of flooding each year from the sea.

This data is sourced from the Environment Agency and Natural Resources Wales.

7.5 Flood Storage Areas

Records within 250m

0

Areas that act as a balancing reservoir, storage basin or balancing pond to attenuate an incoming flood peak to a flow level that can be accepted by the downstream channel or to delay the timing of a flood peak so that its volume is discharged over a longer period.

This data is sourced from the Environment Agency and Natural Resources Wales.



River and coastal flooding - Flood Zones

7.6 Flood Zone 2

Records within 50m	0
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Areas of land at risk of flooding, when the presence of flood defences are ignored. Covering land between Flood Zone 3 (see next section) and the extent of the flooding from rivers or the sea with a 1 in 1000 (0.1%) chance of flooding each year.

This data is sourced from the Environment Agency and Natural Resources Wales.

7.7 Flood Zone 3

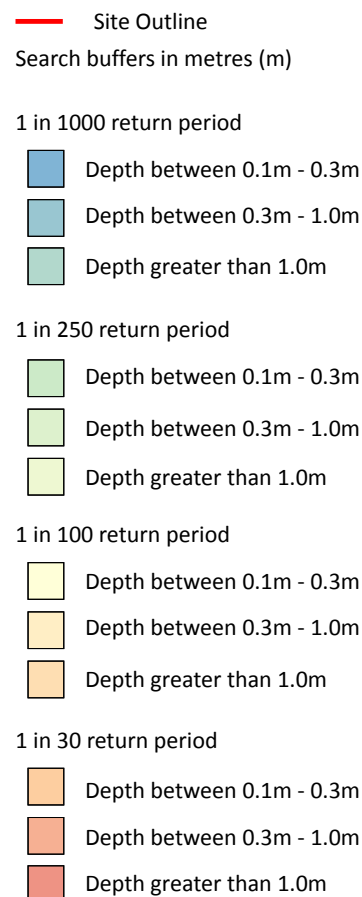
Records within 50m	0
--------------------	---

Areas of land at risk of flooding, when the presence of flood defences are ignored. Covering land with a 1 in 100 (1%) or greater chance of flooding each year from rivers or a 1 in 200 (0.5%) or greater chance of flooding each year from the sea.

This data is sourced from the Environment Agency and Natural Resources Wales.



8 Surface water flooding



8.1 Surface water flooding

Highest risk on site

1 in 30 year, 0.1m - 0.3m

Highest risk within 50m

1 in 30 year, 0.1m - 0.3m

Ambiental Risk Analytics surface water (pluvial) FloodMap identifies areas likely to flood as a result of extreme rainfall events, i.e. land naturally vulnerable to surface water ponding or flooding. This data set was produced by simulating 1 in 30 year, 1 in 100 year, 1 in 250 year and 1 in 1,000 year rainfall events. Modern urban drainage systems are typically built to cope with rainfall events between 1 in 20 and 1 in 30 years, though some older ones may flood in a 1 in 5 year rainfall event.

Features are displayed on the Surface water flooding map on **page 51**

The data shown on the map and in the table above shows the highest likelihood of flood events happening at the site. Lower likelihood events may have greater flood depths and hence a greater potential impact on a site.

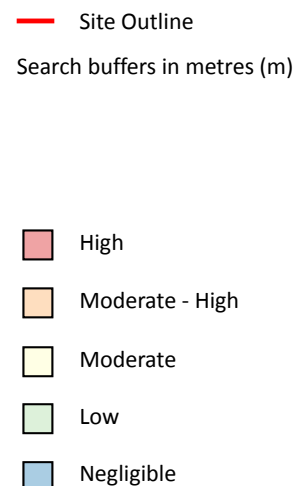
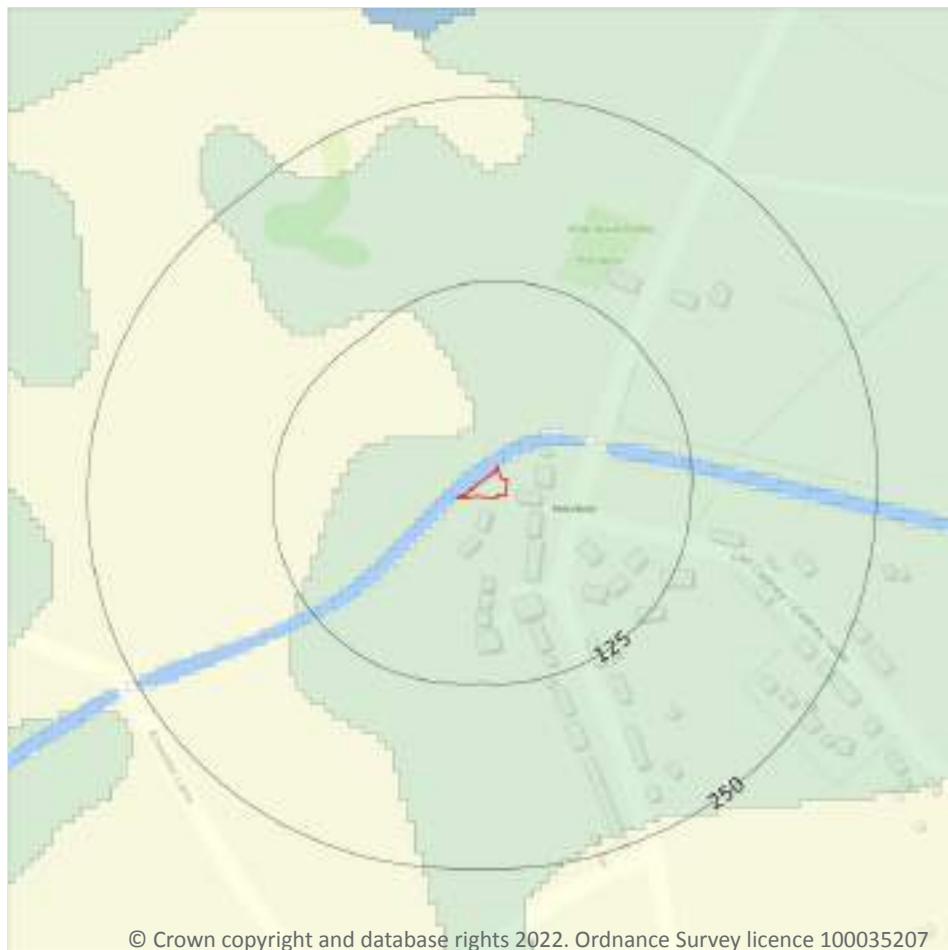
The table below shows the maximum flood depths for a range of return periods for the site.

Return period	Maximum modelled depth
1 in 1000 year	Between 0.3m and 1.0m
1 in 250 year	Between 0.3m and 1.0m
1 in 100 year	Between 0.3m and 1.0m
1 in 30 year	Between 0.1m and 0.3m

This data is sourced from Ambiental Risk Analytics.



9 Groundwater flooding



9.1 Groundwater flooding

Highest risk on site

Low

Highest risk within 50m

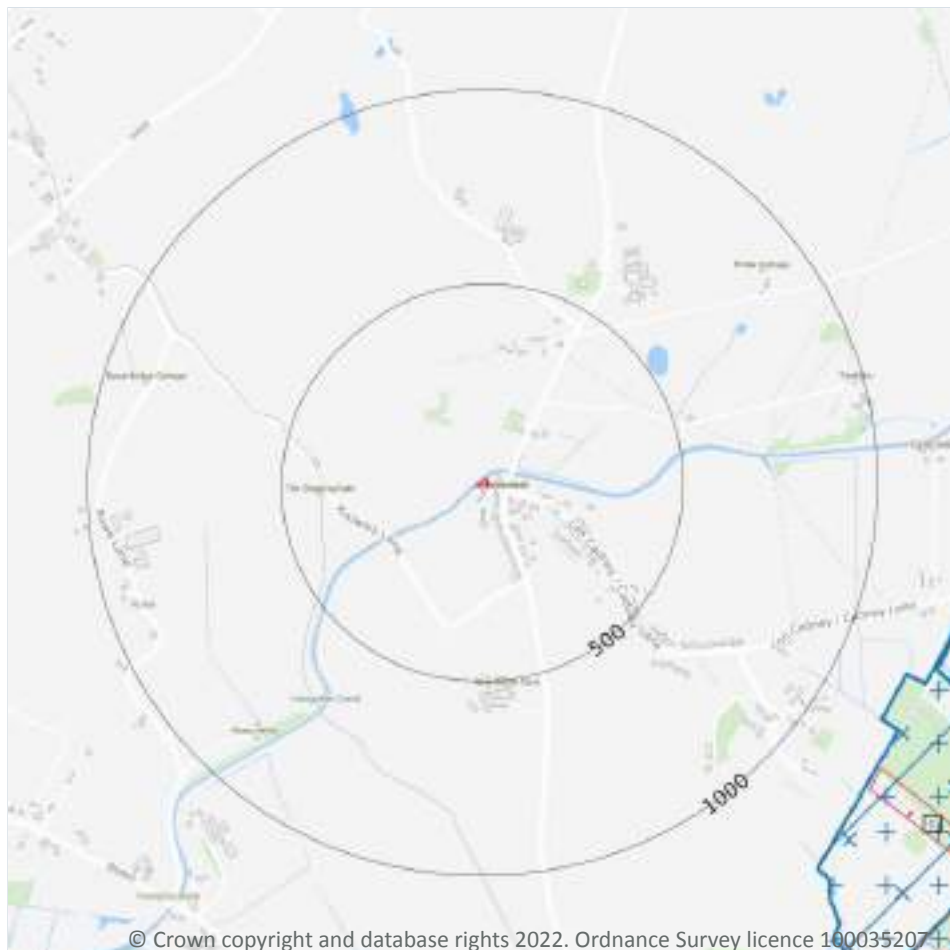
Moderate

Groundwater flooding is caused by unusually high groundwater levels. It occurs when the water table rises above the ground surface or within underground structures such as basements or cellars. Groundwater flooding tends to exhibit a longer duration than surface water flooding, possibly lasting for weeks or months, and as a result it can cause significant damage to property. This risk assessment is based on a 1 in 100 year return period and a 5m Digital Terrain Model (DTM).

Features are displayed on the Groundwater flooding map on **page 53**

This data is sourced from Ambiantal Risk Analytics.

10 Environmental designations



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- Site Outline
- Search buffers in metres (m)
- Sites of Special Scientific Interest (SSSI)
- Conserved wetland sites (Ramsar sites)
- Special Areas of Conservation (SAC)
- National Nature Reserves (NNR)
- Designated Ancient Woodland

10.1 Sites of Special Scientific Interest (SSSI)

Records within 2000m

4

Sites providing statutory protection for the best examples of UK flora, fauna, or geological or physiographical features. Originally notified under the National Parks and Access to the Countryside Act 1949, SSSIs were re-notified under the Wildlife and Countryside Act 1981. Improved provisions for the protection and management of SSSIs were introduced by the Countryside and Rights of Way Act 2000 (in England and Wales) and (in Scotland) by the Nature Conservation (Scotland) Act 2004 and the Wildlife and Natural Environment (Scotland) Act 2010.

Features are displayed on the Environmental designations map on **page 54**

ID	Location	Name	Data source
1	1176m SE	FENN'S, WHIXALL, BETTISFIELD, WEM AND CADNEY MOSSES	Natural Resources Wales

ID	Location	Name	Data source
-	1500m E	FENN'S, WHIXALL, BETTISFIELD, WEM AND CADNEY MOSSES	Natural Resources Wales
E	1615m SE	Fenn's, Whixall, Bettisfield, Wem & Cadney Mosses	Natural England
-	1912m E	Fenn's, Whixall, Bettisfield, Wem & Cadney Mosses	Natural England

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.2 Conserved wetland sites (Ramsar sites)

Records within 2000m

2

Ramsar sites are designated under the Convention on Wetlands of International Importance, agreed in Ramsar, Iran, in 1971. They cover all aspects of wetland conservation and wise use, recognizing wetlands as ecosystems that are extremely important for biodiversity conservation in general and for the well-being of human communities. These sites cover a broad definition of wetland; marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, and even some marine areas.

Features are displayed on the Environmental designations map on **page 54**



ID	Location	Site	Details
A	1176m SE	Name: Midland Meres & Mosses Phase 2 Site status: Listed Data source: Natural England	Overview: The Meres and Mosses form a geographically diverse series of lowland open water and peatland sites in the north-west Midlands of England and north-east Wales. These have developed in natural depressions in the glacial drift left by receding ice sheets which formerly covered the Cheshire/Shropshire Plain. The 18 component sites include open water bodies (meres), the majority of which are nutrient-rich with associated fringing habitats, reed swamp, fen, carr and damp pasture. Peat accumulation has resulted in the nutrient-poor peat bogs (mosses) forming in some sites on the fringes of the meres or completely infilling basins. In a few cases the result is a floating quaking bog or schwingmoor. The wide range of resulting habitats support nationally important flora and fauna. Ramsar criteria: Ramsar criterion 1 The site comprises a diverse range of habitats from open water to raised bog. Ramsar criterion 2 Supports a number of rare species of plants associated with wetlands, including the nationally scarce cowbane <i>Cicuta virosa</i> and, elongated sedge <i>Carex elongata</i>. Also present are the nationally scarce bryophytes <i>Dicranum affine</i> and <i>Sphagnum pulchrum</i>. Also supports an assemblage of invertebrates including several rare species. There are 16 species of British Red Data Book insect listed for this site including the following endangered species: the moth <i>Glyphipteryx lathamella</i>, the caddisfly <i>Hagenella clathrata</i> and the sawfly <i>Trichiosoma vitellinae</i>.



ID	Location	Site	Details
B	1176m SE	Name: Midland Meres & Mosses Phase 2 (Wales) Site status: - Data source: Natural Resources Wales	Overview: The Meres and Mosses form a geographically diverse series of lowland open water and peatland sites in the north-west Midlands of England and north-east Wales. These have developed in natural depressions in the glacial drift left by receding ice sheets which formerly covered the Cheshire/Shropshire Plain. The 18 component sites include open water bodies (meres), the majority of which are nutrient-rich with associated fringing habitats, reed swamp, fen, carr and damp pasture. Peat accumulation has resulted in the nutrient-poor peat bogs (mosses) forming in some sites on the fringes of the meres or completely infilling basins. In a few cases the result is a floating quaking bog or schwingmoor. The wide range of resulting habitats support nationally important flora and fauna. Ramsar criteria: Ramsar criterion 1 The site comprises a diverse range of habitats from open water to raised bog. Ramsar criterion 2 Supports a number of rare species of plants associated with wetlands, including the nationally scarce cowbane <i>Cicuta virosa</i> and, elongated sedge <i>Carex elongata</i>. Also present are the nationally scarce bryophytes <i>Dicranum affine</i> and <i>Sphagnum pulchrum</i>. Also supports an assemblage of invertebrates including several rare species. There are 16 species of British Red Data Book insect listed for this site including the following endangered species: the moth <i>Glyphipteryx lathamella</i>, the caddisfly <i>Hagenella clathrata</i> and the sawfly <i>Trichiosoma vitellinae</i>.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.3 Special Areas of Conservation (SAC)

Records within 2000m	3
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Areas which have been identified as best representing the range and variety within the European Union of habitats and (non-bird) species listed on Annexes I and II to the Directive. SACs are designated under the EC Habitats Directive.

Features are displayed on the Environmental designations map on **page 54**

ID	Location	Name	Features of interest	Habitat description	Data source
A	1176m SE	Fenn's, Whixall, Bettisfield, Wem & Cadney Mosses	Dry heaths; Active raised bogs; Degraded raised bog.	Other land (including Towns, Villages, Roads, Waste places, Mines, Industrial sites); Improved grassland; Dry grassland, Steppes; Humid grassland, Mesophile grassland; Heath, Scrub, Maquis and Garrigue, Phygrana; Bogs, Marshes, Water fringed vegetation, Fens; Coniferous woodland; Inland water bodies (Standing water, Running water); Broad-leaved deciduous woodland	Natural England
B	1176m SE	Fenn's, Whixall, Bettisfield, Wem and Cadney Mosses (Wales)	Dry heaths; Active raised bogs; Degraded raised bog.	Other land (including Towns, Villages, Roads, Waste places, Mines, Industrial sites); Improved grassland; Dry grassland, Steppes; Humid grassland, Mesophile grassland; Heath, Scrub, Maquis and Garrigue, Phygrana; Bogs, Marshes, Water fringed vegetation, Fens; Coniferous woodland; Inland water bodies (Standing water, Running water); Broad-leaved deciduous woodland	Natural Resources Wales
8	1617m SE	Fenn's, Whixall, Bettisfield, Wem and Cadney Mosses (England)	Dry heaths; Active raised bogs; Degraded raised bog.	Other land (including Towns, Villages, Roads, Waste places, Mines, Industrial sites); Improved grassland; Dry grassland, Steppes; Humid grassland, Mesophile grassland; Heath, Scrub, Maquis and Garrigue, Phygrana; Bogs, Marshes, Water fringed vegetation, Fens; Coniferous woodland; Inland water bodies (Standing water, Running water); Broad-leaved deciduous woodland	Natural Resources Wales

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.4 Special Protection Areas (SPA)

Records within 2000m

0

Sites classified by the UK Government under the EC Birds Directive, SPAs are areas of the most important habitat for rare (listed on Annex I to the Directive) and migratory birds within the European Union.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.



10.5 National Nature Reserves (NNR)

Records within 2000m

8

Sites containing examples of some of the most important natural and semi-natural terrestrial and coastal ecosystems in Great Britain. They are managed to conserve their habitats, provide special opportunities for scientific study or to provide public recreation compatible with natural heritage interests.

Features are displayed on the Environmental designations map on **page 54**

ID	Location	Name	Data source
C	1245m SE	Fenn's, Whixall And Bettisfield Mosses	Natural Resources Wales
C	1245m SE	Fenn's, Whixall & Bettisfield Mosses	Natural England
-	1251m E	Fenn's, Whixall And Bettisfield Mosses	Natural Resources Wales
-	1251m E	Fenn's, Whixall & Bettisfield Mosses	Natural England
-	1383m E	Fenn's, Whixall And Bettisfield Mosses	Natural Resources Wales
-	1383m E	Fenn's, Whixall & Bettisfield Mosses	Natural England
-	1574m E	Fenn's, Whixall & Bettisfield Mosses	Natural England
E	1615m SE	Wem Moss	Natural England

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.6 Local Nature Reserves (LNR)

Records within 2000m

0

Sites managed for nature conservation, and to provide opportunities for research and education, or simply enjoying and having contact with nature. They are declared by local authorities under the National Parks and Access to the Countryside Act 1949 after consultation with the relevant statutory nature conservation agency.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.7 Designated Ancient Woodland

Records within 2000m

8

Ancient woodlands are classified as areas which have been wooded continuously since at least 1600 AD. This includes semi-natural woodland and plantations on ancient woodland sites. 'Wooded continuously' does not mean there is or has previously been continuous tree cover across the whole site, and not all trees within the woodland have to be old.

Features are displayed on the Environmental designations map on **page 54**



ID	Location	Name	Woodland Type
-	1481m N	Unknown	Restored Ancient Woodland Site
-	1592m N	Unknown	Ancient Semi Natural Woodland
-	1795m N	Unknown	Plantation on Ancient Woodland Site
-	1797m N	Unknown	Ancient Woodland Site of Unknown Category
-	1865m N	Unknown	Ancient Semi Natural Woodland
-	1876m N	Unknown	Ancient Semi Natural Woodland
-	1880m N	Unknown	Plantation on Ancient Woodland Site
-	1907m N	Unknown	Restored Ancient Woodland Site

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.8 Biosphere Reserves

Records within 2000m

0

Biosphere Reserves are internationally recognised by UNESCO as sites of excellence to balance conservation and socioeconomic development between nature and people. They are recognised under the Man and the Biosphere (MAB) Programme with the aim of promoting sustainable development founded on the work of the local community.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.9 Forest Parks

Records within 2000m

0

These are areas managed by the Forestry Commission designated on the basis of recreational, conservation or scenic interest.

This data is sourced from the Forestry Commission.

10.10 Marine Conservation Zones

Records within 2000m

0

A type of marine nature reserve in UK waters established under the Marine and Coastal Access Act (2009). They are designated with the aim to protect nationally important, rare or threatened habitats and species.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.11 Green Belt

Records within 2000m**0**

Areas designated to prevent urban sprawl by keeping land permanently open.

This data is sourced from the Ministry of Housing, Communities and Local Government.

10.12 Proposed Ramsar sites

Records within 2000m**0**

Ramsar sites are areas listed as a Wetland of International Importance under the Convention on Wetlands of International Importance especially as Waterfowl Habitat (the Ramsar Convention) 1971. The sites here supplied have a status of 'Proposed' having been identified for potential adoption under the framework.

This data is sourced from Natural England.

10.13 Possible Special Areas of Conservation (pSAC)

Records within 2000m**0**

Special Areas of Conservation are areas which have been identified as best representing the range and variety within the European Union of habitats and (non-bird) species listed on Annexes I and II to the Directive. SACs are designated under the EC Habitats Directive. Those sites supplied here are those with a status of 'Possible' having been identified for potential adoption under the framework.

This data is sourced from Natural England and Natural Resources Wales.

10.14 Potential Special Protection Areas (pSPA)

Records within 2000m**0**

Special Protection Areas (SPAs) are areas designated (or 'classified') under the European Union Wild Birds Directive for the protection of nationally and internationally important populations of wild birds. Those sites supplied here are those with a status of 'Potential' having been identified for potential adoption under the framework.

This data is sourced from Natural England.

10.15 Nitrate Sensitive Areas

Records within 2000m**0**

Areas where nitrate concentrations in drinking water sources exceeded or was at risk of exceeding the limit of 50 mg/l set by the 1980 EC Drinking Water Directive. Voluntary agricultural measures as a means of reducing the levels of nitrate were introduced by DEFRA as MAFF, with payments being made to farmers who complied. The scheme was started as a pilot in 1990 in ten areas, later implemented within 32 areas. The scheme was



closed to further new entrants in 1998, although existing agreements continued for their full term. All Nitrate Sensitive Areas fell within the areas designated as Nitrate Vulnerable Zones (NVZs) in 1996 under the EC Nitrate Directive (91/676/EEC).

This data is sourced from Natural England.

10.16 Nitrate Vulnerable Zones

Records within 2000m	6
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Areas at risk from agricultural nitrate pollution designated under the EC Nitrate Directive (91/676/EEC). These are areas of land that drain into waters polluted by nitrates. Farmers operating within these areas have to follow mandatory rules to tackle nitrate loss from agriculture.

Location	Name	Type	NVZ ID	Status
On site	-	Surface Water	598	Existing
On site	R Tern - conf R Roden to conf R Severn NVZ	Surface Water	598	Existing
461m NE	-	Surface Water	598	Existing
461m E	R Tern - conf R Roden to conf R Severn NVZ	Surface Water	598	Existing
1767m SW	R Tern - conf R Roden to conf R Severn NVZ	Surface Water	598	Existing
1832m W	R Tern - conf R Roden to conf R Severn NVZ	Surface Water	598	Existing

This data is sourced from Natural England and Natural Resources Wales.

SSSI Impact Zones and Units



- Site Outline
- Search buffers in metres (m)
- SSSI Impact Risk Zones
- SSSI Units
- Not recorded
- Favourable
- Unfavourable - Recovering
- Unfavourable - No change
- Unfavourable - Declining
- Partially destroyed
- Destroyed

10.17 SSSI Impact Risk Zones

Records on site

1

Developed to allow rapid initial assessment of the potential risks to SSSIs posed by development proposals. They define zones around each SSSI which reflect the particular sensitivities of the features for which it is notified and indicate the types of development proposal which could potentially have adverse impacts.

Features are displayed on the SSSI Impact Zones and Units map on **page 63**

ID	Location	Type of developments requiring consultation
1	On site	Infrastructure - Pipelines, pylons and overhead cables. any transport proposal including road, rail and by water (excluding routine maintenance). airports, helipads and other aviation proposals. Minerals, Oil and Gas - Planning applications for quarries, including: new proposals, review of minerals permissions (romp), extensions, variations to conditions etc. oil & gas exploration/extraction. Air pollution - Any industrial/agricultural development that could cause air pollution (incl: industrial processes, livestock & poultry units with floorspace > 500m², slurry lagoons & digestate stores > 200m², manure stores > 250t). Combustion - General combustion processes >20mw energy input. incl: energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis/gasification, anaerobic digestion, sewage treatment works, other incineration/ combustion. Waste - Landfill. incl: inert landfill, non-hazardous landfill, hazardous landfill. Composting - Any composting proposal with more than 75000 tonnes maximum annual operational throughput. incl: open windrow composting, in-vessel composting, anaerobic digestion, other waste management. Water supply - Large infrastructure such as warehousing / industry where total net additional gross internal floorspace following development is 1,000m² or more.

This data is sourced from Natural England.

10.18 SSSI Units

Records within 2000m	8
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Divisions of SSSIs used to record management and condition details. Units are the smallest areas for which Natural England gives a condition assessment, however, the size of units varies greatly depending on the types of management and the conservation interest.

Features are displayed on the SSSI Impact Zones and Units map on **page 63**

ID:	5
Location:	1615m SE
SSSI name:	Fenn's, Whixall, Bettisfield, Wem & Cadney Mosses
Unit name:	Wem Moss Central Core (Raised Bog)
Broad habitat:	Bogs - Lowland
Condition:	Unfavourable - Recovering
Reportable features:	

Feature name	Feature condition	Date of assessment
Aggregations of breeding birds - Curlew, Numenius arquata	Not Recorded	01/01/1900
H7120 Degraded raised bogs (still capable of natural regeneration)	Unfavourable - Recovering	11/01/2005
Invert. assemblage W312 sphagnum bog	Not Recorded	01/01/1900
Outstanding dragonfly assemblage	Not Recorded	01/01/1900
Raised bog (lowland)	Not Recorded	01/01/1900



ID: 6
 Location: 1616m SE
 SSSI name: Fenn's, Whixall, Bettisfield, Wem & Cadney Mosses
 Unit name: Wem Moss Woodland Fringe (Marginal Woodland)
 Broad habitat: Bogs - Lowland
 Condition: Unfavourable - Recovering
 Reportable features:

Feature name	Feature condition	Date of assessment
H7120 Degraded raised bogs (still capable of natural regeneration)	Favourable	13/01/2010
Raised bog (lowland)	Not Recorded	01/01/1900

ID: 7
 Location: 1617m SE
 SSSI name: Fenn's, Whixall, Bettisfield, Wem & Cadney Mosses
 Unit name: Wem Moss S.w. (Improved Grassland)
 Broad habitat: Bogs - Lowland
 Condition: Unfavourable - No change
 Reportable features:

Feature name	Feature condition	Date of assessment
Aggregations of breeding birds - Curlew, Numenius arquata	Not Recorded	01/01/1900
H7120 Degraded raised bogs (still capable of natural regeneration)	Unfavourable - Recovering	13/01/2010
Raised bog (lowland)	Not Recorded	01/01/1900

ID: -
 Location: 1683m SE
 SSSI name: Fenn's, Whixall, Bettisfield, Wem & Cadney Mosses
 Unit name: Wem Moss N (Marshy Acid Grass On Peat)
 Broad habitat: Bogs - Lowland
 Condition: Unfavourable - No change
 Reportable features:

Feature name	Feature condition	Date of assessment
Aggregations of breeding birds - Curlew, Numenius arquata	Not Recorded	01/01/1900
H7120 Degraded raised bogs (still capable of natural regeneration)	Unfavourable - Recovering	13/01/2010
Raised bog (lowland)	Not Recorded	01/01/1900