



N O R T H E R N
S T R U C T U R A L S E R V I C E S

PHASE 1 CONTAMINATED LAND RISK ASSESSMENT

REPORT NO. C12553

PART 1

Land at Bridge End

Macclesfield Road

Leek

Issue : Final

Issue Date :24th September 2018

Northern Structural Services

1 Prestbury Rd, Macclesfield, SK10 1AU



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**Land at Bridge End
Macclesfield Road
Leek**

For

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c/o

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A handwritten signature in red ink, appearing to read 'NF Johnson', is written over the printed name and title of the Associate Geotechnical Engineer.

Report Status	Desk Study	Issue Date	24th September 2018
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PART 2 - ENVIROCHECK

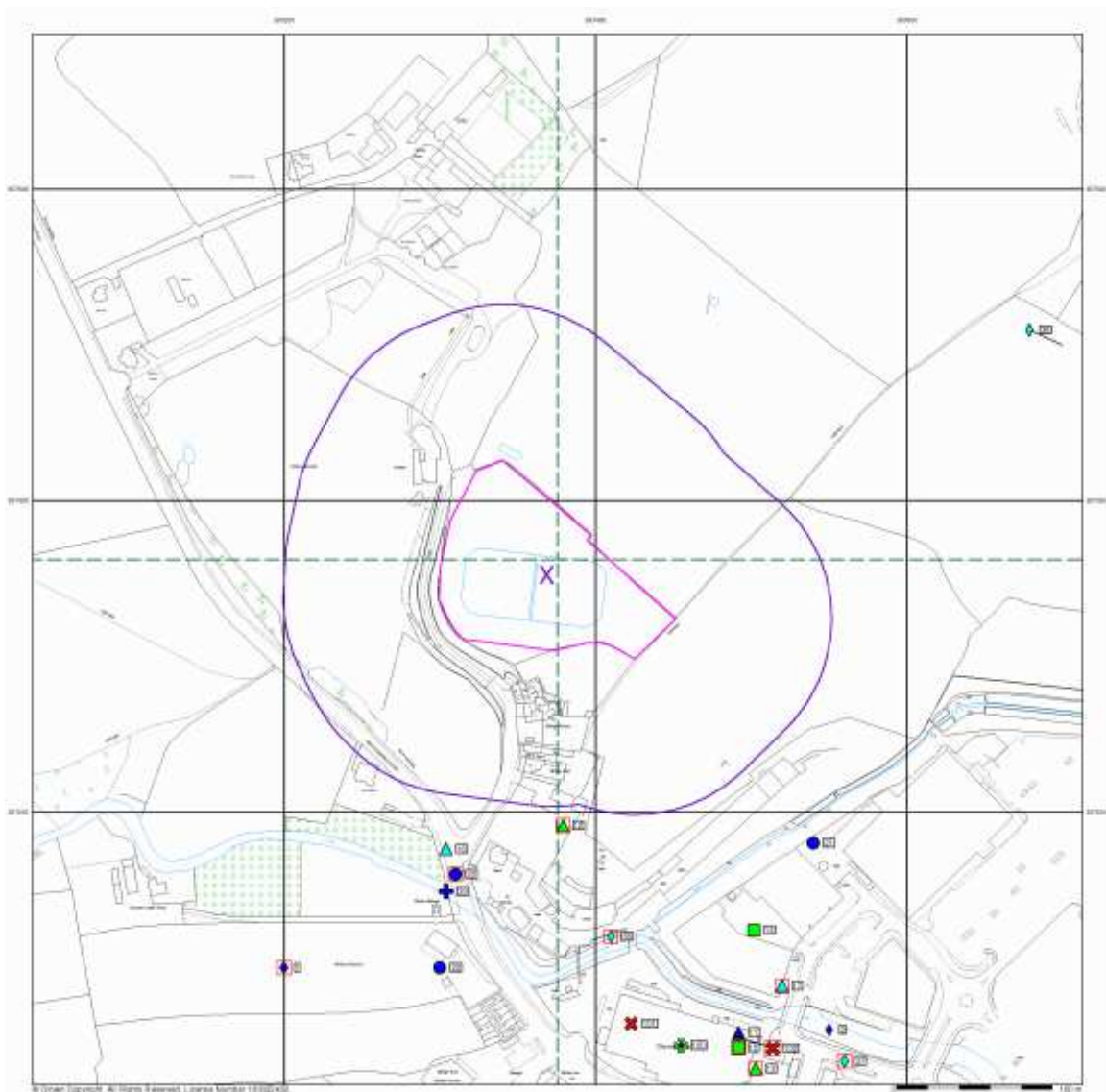
Development Proposal
Envirocheck Legend
Flood Map
EA/NRW Suitability Map
River Lines
Historical Borehole Map
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1: 2500 Historical Plans
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1 DISCUSSION

This report is a preliminary risk assessment report that references an Envirocheck© Report prepared by Landmark Information Services and discusses a walkover study undertaken on 24th April 2018.

This report has been undertaken for Urban Nu Limited c/o Rob Duncan Planning Consultancy Ltd for the assessment of the site for a proposed new dwellings.

The National Grid reference is 397370, 357350 and covers an area of approximately 1.14 hectares. The location of the site is shown on the plan below.



2 SITE DESCRIPTION

The site is currently the location of a pair of water storage ponds, formed as a soil bund surround, circa 0.5m to 1.4m above general level with a depth estimated to be of the order of 5.0m – 6.0m. The water storage ponds have a polymer liner.

The surrounding area is flat and level it is likely to have been formed by engineering of the excavated spoil from the storage pond construction.

The site is elevated above the cottages and on Bridge End lane. There is a cobbled lane with sloping banks up to the site.

The following pictures show the development site area.



View of the storage pond showing liner.



View of pond perimeter showing the wrapped liner buried at the endge.



South east corner showing the falling ground to the lane below.



View across the site toward the north and north west.



View across the eastern end of the storage ponds and the gently sloping field.



View to the west. Storage pond at the right side.



View from the west site entrance with the storage ponds at the rear.



Access roadway, the development site is to the left of the picture.

The GoogleEarth© aerial photograph shows the site setting



3 ENVIROCHECK REPORT©

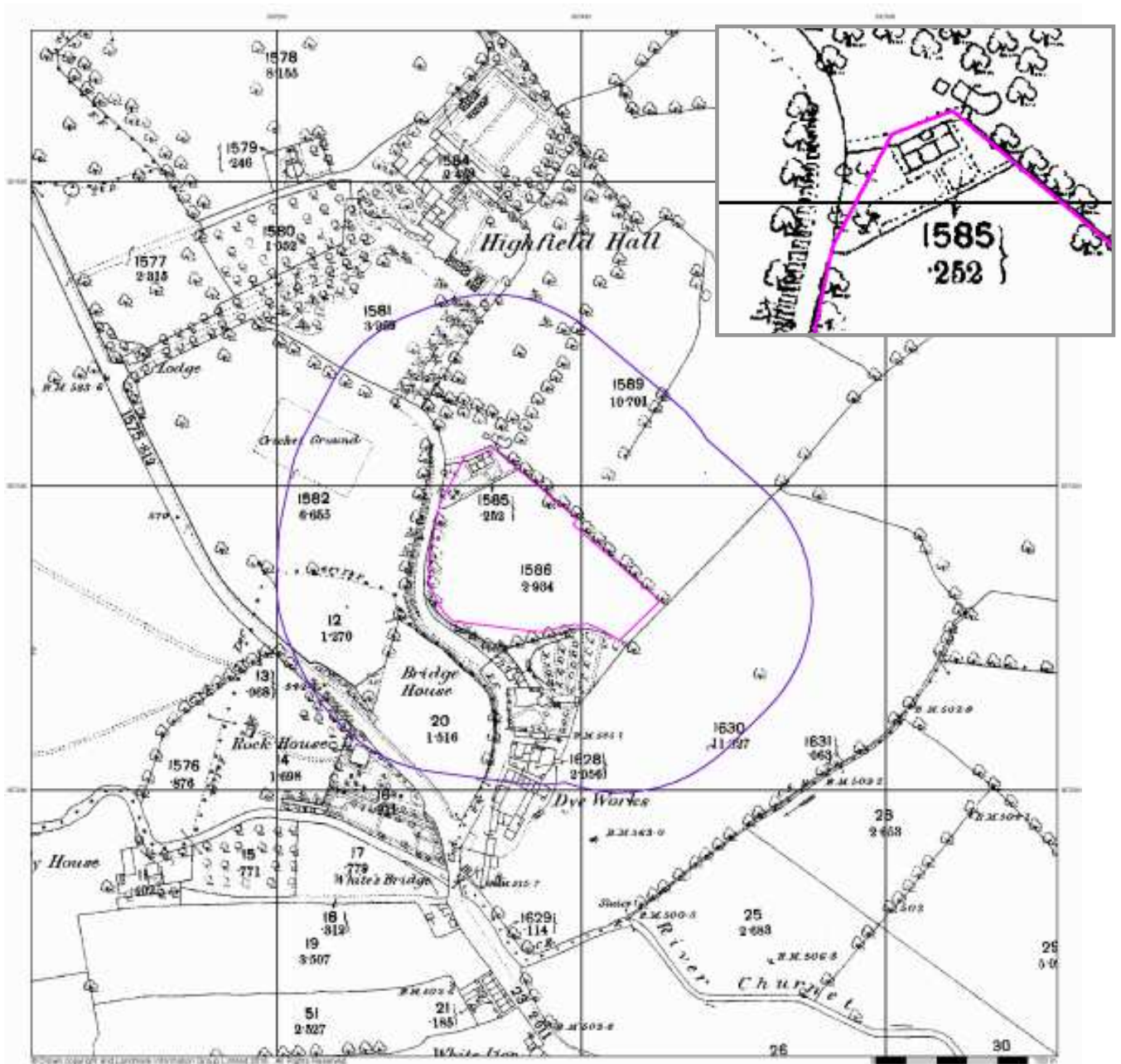
The original Envirocheck© report is presented in the appendices of this volume.

The Envirocheck© report is a compilation of:

- Historical Ordnance Survey plans from 1:105600, 1:2500 and 1:1250 scales
- Public environmental records from Environment Agency, British Geological Survey and, Staffordshire Moorlands District Council.
- Flooding information and river quality information from Environment Agency
- Landfill sites from British Geological Survey and Environment Agency.
- Hazard substances storage and uses information from Staffordshire Moorlands District Council.
- Geological Information from British Geological Survey
- Sensitive land uses from Staffordshire Moorlands District Council, Natural England and DEFRA
- Industrial Land uses from Thompsons Directory and Catalist Ltd

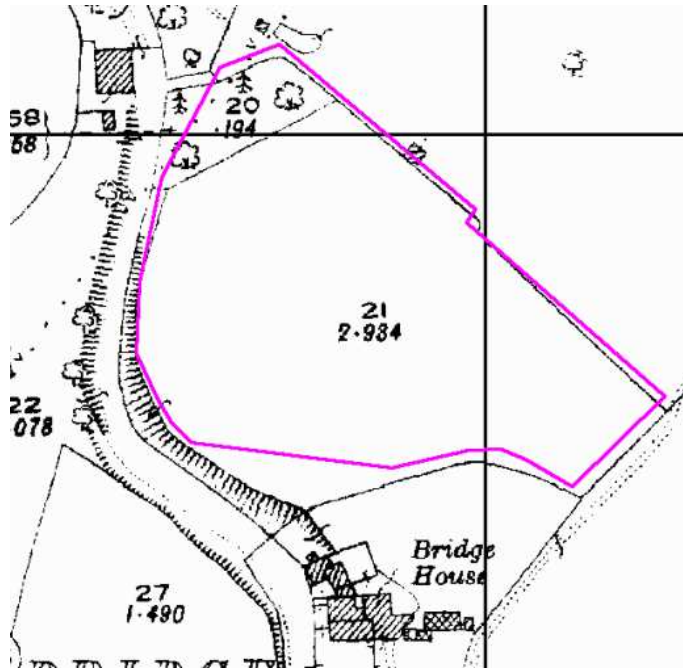
4 HISTORICAL SETTING

The earliest mapping (1879) shows the development area to be in open farmland. There is a set of buildings at the northern portion of the site.



There are no changes to the 1899 mapping.

The mapping of 1925 shows that the buildings in the northern portion of the site are gone. There are no changes on the remainder of the site.



There are no changes on the 1937 mapping. There are no changes on the mapping up to 1974.

The mapping of 1984 shows that the water storage ponds have been constructed.



There are no changes on the later mapping.

5 SITE GEOLOGY

The published British Geological Survey (BGS) map Sheet 111 Buxton shows the site underlain by:

- ♦ Drift – the higher level of the site is shown to be underlain by Cohesive Glacial Till (Boulder Clay). The lower elevation, Bridge End Lane is shown to have drift absent.
- ♦ Bedrock- Triassic Age Sherwood Sandstone, Chester Formation. comprises conglomerates and reddish brown, cross-bedded, pebbly sandstones with subordinate beds of red-brown mudstone. The conglomerates have a reddish brown sandy matrix and consist mainly of pebbles of brown or purple quartzite, with quartz conglomerate and vein quartz.

6 SITE HYDROGEOLOGY

The groundwater vulnerability map, Sheet 17 Derbyshire & North Staffordshire, shows the site to be underlain by:

- Soils: Soils of High Leaching Potential
- Drift Deposits: Low permeability drift deposits occurring at the surface and overlying Major and Minor Aquifers
- Superficial Aquifer: Secondary Aquifer - Undifferentiated
- Bedrock Aquifer: Principal Aquifer
- The site is underlain by a source protection zone. Data sheet item 44 relates to Zone III (Total Catchment): The total area needed to support the discharge from the protected groundwater source.
- It should be noted that to the south and east of the development area, at lower level are works associated with historical dye works and speciality chemicals works.
- There are nearby licensed borehole abstractions

From 1 April 2010 The Environment Agency Groundwater Protection Policy will be using aquifer designations that are consistent with the Water Framework Directive. These designations reflect the importance of aquifers in terms of groundwater as a resource (drinking water supply) but also their role in supporting surface water flows and wetland ecosystems.

Principal Aquifers - These are layers of rock or drift deposits that have high intergranular and/or fracture permeability - meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale. In most cases, principal aquifers are aquifers previously designated as major aquifer.

These include a wide range of rock layers or drift deposits with an equally wide range of water permeability and storage. Secondary aquifers are subdivided into two types:

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;

Secondary B - predominantly lower permeability layers which may store and 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.

Secondary Undifferentiated - Secondary Undifferentiated - has been 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.

Unproductive Strata - These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow.

7 ENVIRONMENTAL ISSUES.

There are no database references within the site boundary.

The site is not with an area of sensitive land use.

The site is not located within an area at risk from flooding from rivers with out or with defences.

The following table is an extract of the geological details of the Envirocheck© report.

Coal Mining Affected Area	Not in an area which may be affected by coal mining
Non Coal Mining	No Hazard
Potential for Collapsible Ground Stability Hazards	No Hazard
Potential for Compressible Ground Stability Hazards	No Hazard
Potential for Ground Dissolution Stability Hazards	No Hazard
Potential for Landslide Ground Stability Hazards	Very Low
Potential for Running Sand Ground Stability Hazards	No Hazard
Potential for Shrinking or Swelling Clay Ground Stability Hazards	No Hazard
Radon	The property is in a lower probability radon area, as less than 1% of homes are above the action level. No radon protective measures are necessary in the construction of new dwellings or extensions

8 RISK ASSESSMENT

Part IIA of the EPA 1990 introduced on the 1st April 2000 and the relevant planning guidance requires that a staged approach to the assessment of the potential risk a development site may pose to the intended final use after development.

In 2012 the Nation Planning Policy Framework (NPPF) was established and the requirements for the assessment of contaminated land is given in Section 120 and 121

120. To prevent unacceptable risks from pollution and land instability, planning policies and decisions should ensure that new development is appropriate for its location. The effects (including cumulative effects) of pollution on health, the natural environment or general amenity, and the potential sensitivity of the area or proposed development to adverse effects from pollution, should be taken into account. Where a site is affected by contamination or land stability issues, responsibility for securing a safe development rests with the developer and/or landowner.

121. Planning policies and decisions should also ensure that:

- *the site is suitable for its new use taking account of ground conditions and land instability, including from natural hazards or former activities such as mining, pollution arising from previous uses and any proposals for mitigation including land remediation or impacts on the natural environment arising from that remediation;*
- *after remediation, as a minimum, land should not be capable of being determined as contaminated land under Part IIA of the Environmental Protection Act 1990; and*
- *adequate site investigation information, prepared by a competent person, is presented.*

The Definition in Part IIA:

2.1 Section 78A(2) defines CONTAMINATED LAND for the purposes of Part IIA as:

"any land which appears to the LOCAL AUTHORITY in whose area it is situated to be in such a condition, by reason of substances in, on or under the land, that -

"(a) SIGNIFICANT HARM is being caused or there is a SIGNIFICANT POSSIBILITY of such harm being caused; or

"(b) POLLUTION OF CONTROLLED WATERS is being, or is likely to be, caused".

In assessing the potential risk of environmental impact the CLR 11 (Model Procedures for the management of Land Contamination) Source – Pathway – Receptor Model is followed.

RISK ASSESSMENT FOR GAS HAZARD

The site has been assessed using the criteria given in BS 8576 2013 Guidance on investigations for ground gas, BS8485 "Code of Practice for characterisation and remediation from ground gas in affected developments", CIRIA Report 665 "Assessing risks posed by hazardous ground gases" and NHBC Report 04-2007 "Guidance on the evaluation of development proposals on sites where methane and carbon dioxide are present"

There are no nearby landfill sites or recent infilled ponds that would pose a risk to the proposed development.

RISK ASSESSMENT FOR HUMAN HEALTH

A review of the historical mapping shows that in recorded history part of the site was occupied by a small set of buildings in the northern portion of the site and central portion had been excavated to form the in-ground storage ponds.

Therefore site is considered to be at low risk to the proposed residential development.

RISK TO CONTROLLED WATERS

The historical review has shown the site to not been to have been used for a contaminative land use that would result in a risk to human health.

9 SOURCE CHARACTERISATION

Type of Risk Assessment	Source	Pathway	Receptor	Remarks
Water Resources	Impacted Soils	Migration of leachate	Surface water and bedrock aquifer	It is considered that the historical land-use has a very low risk of either impacted soils or impacted perched groundwater to water resources.
	Impacted Groundwater	Migration of groundwater		
Human Health	Soil gases	Inhalation of indoor air	Site Workers Site Residents Off Site Residents	It is considered that there is a low risk of impacted soils being a source of permanent ground gases or Volatile Organic Compounds.
	Impacted Soils	Inhalation of vapours		It is considered that there is a low risk of impacted soils being present on the site. The area which had the former structures should be investigated to determine if there is any risk from these structures. It is considered that there is a low probability of imported contaminated soils being used on site as part of previous construction works.
		Direct Ingestion		
		Direct dermal contact		
		Vegetable Ingestion		
	Impacted Groundwater	Inhalation of indoor air		It is considered that there is a low risk of impacted soils being a source of impacted groundwater.
		Direct Ingestion		
		Direct dermal contact		
Building and services	Soil Gases	Migration through floor slab	Site Workers Site Residents Off site Residents	There are no nearby recorded or registered landfill sites or recent infilled ponds. The property is in a lower probability radon area, as less than 1% of homes are above the action level.No radon protective measures are necessary in the construction of new dwellings or extensions

10 FURTHER INVESTIGATION

The Phase II investigation requirements should comprise basic soil sampling and routine testing.

The development proposal comprises eleven detached dwellings, with enclosed private rear garden, when the void of the storage ponds are filled.

Appropriate geotechnical investigation should be supplemented with some contamination sampling of any identified Made Ground or visually assessed contaminated soil. The existing topsoil should be sampled and tested to determine the suitability for re-use in the completed development.

Analysis should include testing for the following contaminants by a laboratory with UKAS/MCERTS accreditation:

We consider that tests should use the suites of tests indicated below that give a generic scope of analyses that can be used to assess the CLEA risk.

As noted above we suggest that at the time of site clearance the development area is inspected and any soils considered to be at risk of contamination should be sampled and tested.

Standard Soil Suite

Total Metals : As, Ba, Be, Cd, Cr, Pb, Hg, Se, Cu ,Ni, Vn, Zn
Water Soluble Boron
Hexavalent Chromium
Cyanide
Phenol
Total Sulphate
Sulphide
pH
Poly Aromatic Hydrocarbons (PAH)
16 USEPA Priority Pollutants by GC

Speciated Total Petroleum Hydrocarbons Aliphatic/Aromatic Split. Benzene Toluene Ethylbenzene and Xylene (BTEX)

Visual Identification of Asbestos Fibres in Soil.
Additional tests for fibre identification and/or fibre quantification may be undertaken.

Development Proposal

