



Obsidian Strategic

Land to the north of Cropredy, Cherwell District, Oxfordshire

Preliminary Risk Assessment

305297 R01 (00)

RSK GENERAL NOTES

Project No.: 305297 R01 (00)


Title: Preliminary Risk Assessment : Land to the north of Cropredy, Cherwell District, Oxfordshire


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Where field investigations have been carried out, these have been restricted to a level of detail required to achieve the stated objectives of the work.

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EXECUTIVE SUMMARY

Commissioning and purpose of assessment	<p>RSK Environment Limited (RSK) was commissioned by Obsidian Strategic to carry out a Preliminary Risk Assessment of the land to the north of Cropredy, Cherwell District, Oxfordshire, OX17 1NU, Grid ref: 446930, 247140. The overall aim of the project was to assess land contamination sources and geotechnical constraints to the proposed future residential development.</p>
DESK-BASED ASSESSMENT	
Site description and proposed development	<p>The site currently comprises undeveloped farmland and occupies an area of 11.12 hectares and is being considered for development for residential use.</p>
History of site and surrounding area	<p>It is assumed that the site was formerly used for agricultural purposes as the site has comprised an undeveloped green field since 1885.</p> <p>There is a potential source of ground gas because the Envirocheck report has referenced a potential local authority landfill within the site boundary. No additional on-site sources have been identified at desk study level. The presence of a roadway connecting the western boundary of the site to the northeast may also be associated with the potential presence of made ground, which, depending on its composition, may indicate a potential risk of ground gas generation.</p> <p>Other off-site potentially contaminative current activities that could pose contaminative threat to the site in the surrounding area are limited.</p>
Previous site investigation (SI) reports	<p>There are no previous SI reports.</p>
Geology and environmental setting	<p>According to published geological data the Site is underlain by a Charmouth Mudstone Formation bedrock. Superficial deposits may be encountered on the eastern boundaries of the site, adjacent to the Oxford Canal. These superficial deposits are comprised of Alluvium, made up of clay, silt, sand and gravels.</p> <ul style="list-style-type: none"> • Groundwater within the Charmouth Mudstone Formation classified as a Secondary undifferentiated bedrock aquifer with medium vulnerability • Groundwater within the superficial Alluvium deposits classified as a Secondary superficial aquifer with medium vulnerability • Groundwater abstractions for general farming and domestic use located 208 m east of the site • Surface water within the Oxford Canal located 6m from site • Other sensitive receptors including the Upper Thames Tributaries located adjacent southeast from site

Site reconnaissance findings	<p>The site comprises undeveloped farmland for the entirety of the site with the inclusion of a small, gated pathway connecting the site upper eastern corner to the western boundary (entrance) of the site.</p> <p>Overhead powerlines were observed running east to west across the lower southern extents of the site.</p> <p>The site is bounded by vegetation, wooden fencing, the Oxford canal to the east and a residential housing area on the southern boundary of the site.</p>
Geotechnical constraints assessment	<p>The key findings of the initial geotechnical assessment are as follows:</p> <ul style="list-style-type: none"> • Highly compressible and low bearing capacity soils; • Silt-rich soils susceptible to rapid strength loss in wet conditions; • running sand at and below water table; and • high groundwater table (waterlogged ground). <p>These findings have been detailed based upon information received from the Envirocheck report and BGS database.</p>
Initial conceptual site model (CSM) and preliminary risk assessment (PRA)	<p>Potentially complete contaminant linkages identified with a risk estimate of moderate to low or above include:</p> <ul style="list-style-type: none"> • Future site users – residential users [oral, dermal and inhalation exposure with impacted soil, soil vapour and dust/fibres, ingestion of home-grown produce, inhalation of vapours from groundwater and / or NAPL if present]; • future adjacent site users – residential, public open space users [migration of contamination via dust/fibre deposition, vapour or groundwater migration combined with inhalation]; • future buildings and services [direct contact with contaminated soils or groundwater and chemical attack]; • groundwater in secondary undifferentiated aquifer within the Charmouth mudstone Formation deposits [leaching from soils/ percolation to aquifer/ lateral migration of dissolved phase/ NAPL etc.]; and, • Future site users – residential users [migration and ingress of ground gases into buildings, build-up in confined spaces and explosion/ asphyxiation]. <p>Uncertainties and data gaps have been identified in the CSM at desk study stage and should be considered in the design of future intrusive investigation if proposed.</p>
Recommendations including issues for further assessment	<p>The following recommendations are made for further assessment of the site to address the risks identified above and to address remaining uncertainties:</p> <ul style="list-style-type: none"> • Determination of local authority landfill coverage; and • Phase 2 Geo-environmental and Geotechnical Site Investigation.
<p><i>The information given in this summary is necessarily incomplete and is provided for initial briefing purposes only. The summary must not be used as a substitute for the full text of the report.</i></p>	

1 INTRODUCTION

1.1 Commissioning

RSK Environment Limited (RSK) was commissioned by Obsidian Strategic to carry out a Preliminary Risk Assessment of the land immediately north of Cropredy, Cherwell District, Oxfordshire, OX17 1NU. The project was carried out to an agreed brief as set out in RSK's proposal (Ref. 305297, dated 30th of September 2022).

RSK's service constraints are shown in [Appendix A](#).

The Site in question is being considered for development for residential use.

1.2 Objectives

The objective of the work is:

- to identify any land contamination and geotechnical constraints to the proposed development and to support discharge of relevant planning conditions and relevant building control requirements.

1.3 Scope of works

The scope of this assessment has been developed in accordance with relevant British Standards and authoritative technical guidance as referenced through the report. The assessment of the contamination status of the site is in line with the technical approach presented in Land Contamination Risk Management (LCRM) (Environment Agency, 2021) – which supersedes CLR11 Model Procedures for Land Contamination – and in general accordance with BS 10175: 2011 + A2 2017 (BSI, 2017). It is also compliant with relevant planning policy and guidance.

A brief summary of relevant legislation and policy relating to land contamination is given in [Appendix B](#).

The scope of works for the assessment has included the following:

Desk Study:

- review of the history of development on the site and surroundings;
- assessment of local geology, hydrogeology and hydrology;
- assessment of the potential risks from past, present and future coal mining activities;
- review of relevant information held by appropriate statutory authorities;
- review of any previous site investigation reports made available;
- completion of a site reconnaissance survey to assess the visual condition of the site;
- development of an initial conceptual site model (CSM);
- preliminary consideration of geotechnical constraints and hazards; and
- identification of the need for further action, e.g. intrusive investigations, if any.

1.4 Existing reports

No existing reports relevant to the site assessment have been provided to RSK.

1.5 Limitations

This report is subject to the RSK service constraints given in [Appendix A](#) and limitations that may be described through this document.

2 SITE DETAILS

2.1 Site location

Site location details are presented in Table 1 and a site location plan is provided on [Figure 1](#).

Table 1 Site location details

Site name	Land north of Cropredy
Full site address and postcode	Land north of Cropredy, Cherwell District, Oxfordshire, OX17 1NU
National Grid reference (centre of site)	446930, 247140

2.2 Site description

The Site boundary and current site layout are shown on [Figure 2](#). The Site covers an area of c. 11.12 hectares. It is currently occupied by undeveloped farmland.

The site area is L-shaped extending eastwards. It is bounded by the Oxford Canal to the east and Clayton Road to the west, with residential area to the south and a barn/Cropredy marina located immediately to the north.

The Site is located in Cropredy, Oxfordshire within a predominantly rural setting. Immediate surrounding land uses are described in Table 2.

Table 2 Surrounding land uses

North	Cropredy Marina/Poplars Farm
East	Oxford Canal
South	Maple Cottage/Creampot Lane residents
West	Clayton Road/undeveloped farmlands

2.3 Development plans

No details of the proposed ground levels have been provided, therefore for the purpose of this report it has been assumed that the current levels will remain unchanged.

There are no active planning applications pertaining to the site according to the Oxfordshire County Council planning portal.

3 DESK-BASED ASSESSMENT

The desktop study was designed generally to meet the objectives of a preliminary (phase 1) investigation, as defined by BS 10175:2011 + A2 2017 (BSI, 2017) and this assessment relates to LCRM Stage 1, Tier 1 preliminary risk assessment. The "vicinity" of the site for the purposes of this report is defined as locations situated within an approximate 250 m radius of the site, although certain sources and/ or sensitive targets further than 250 m may also have been considered.

The study aims principally to identify and assess the potential risks and liabilities associated with contamination of the ground, on and in the vicinity of the site. While this includes consideration of current operations and housekeeping on the site, the report does not constitute a comprehensive environmental audit of the site, as covered under ISO 14001.

3.1 Site history

3.1.1 Historical development record

The development history of the site and surrounding area based upon assessment of historical plans and records is detailed in Table 3. The historical maps reviewed are shown within the environmental database report in [Appendix C](#).

Table 3 Summary of historical development

Date from	Date to	Historical Land Use (on-site)	Area of site
2021	2022	Pathway connecting the north-eastern boundary of the site (Cropredy Marina) to Clayton Road on the western boundary of the site.	North
Date from	Date to	Historical Land Use (off-site)	Distance (m) and orientation
1885	Active	Western railway	250m W
1923	2006	Fuel storage tank	600m SW
1982	2021	Burial Gardens	150m W
1982	2021	Allotment Gardens	250m W
1982	Active	Sewage Works	650m SE
1999	Active	Polars Farm	250m N
1999	Active	Manor Farm	500m S
2022	Active	Telephone Mast	250m W
-	Active	Fiddlers Elbow Grease, Cosmetic Manufacturers	201 SE
-	Active	G R Wheeler, Mechanical Engineers	222 (S)
-	Active	Abracadabra Valeting, vehicle cleaning services	104m SW

-	Active	Copredy Bridge Cars, vehicle repair and servicing	334m S
-	Active	Gama Cars, vehicle repair and servicing	335m S
-	Active	Angel Tuning, vehicle repair and servicing	335m S
-	Active	Industrial feature: tank	179m SE
Relevant information sources: Historical OS maps <input checked="" type="checkbox"/> Town plans <input type="checkbox"/> Information from the Local Planning Authority <input type="checkbox"/> Aerial photography <input checked="" type="checkbox"/> Previous reports <input type="checkbox"/>			
<i>Note: Reference to published historical maps provides invaluable information regarding the land use history of the site, but historical evidence may be incomplete for the period pre-dating the first edition and between successive maps.</i>			

The site is situated within a relatively remote agricultural area with limited industrial development. There is considered to be a low risk of contamination associated with the site.

3.1.2 Unexploded ordnance

A review of publicly available unexploded ordnance (UXO) risk maps indicates that the site is located in an area with low potential for wartime bombs to be present (Zetica, 2022). (see Appendix G).

3.2 Information from environmental database report

Relevant environmental permits and incidents detailed within the environmental database report (see [Appendix C](#)) are summarised below in Table 4.

Table 4 Summary of environmental permits, landfills and incidents

Data type	Entries on-site	Entries <250m from site	Entries >250m from site of relevance	Details
Agency and hydrological				
Environmental permits – incorporating Integrated Pollution Prevention and Control, Integrated Pollution Controls, Local Authority Integrated Pollution Prevention and Control	-	-	2	(296m S): Cherwell District Council, Environmental Health Department, Ref. CDC/WOB/013, issued 13 th March 1996

Data type	Entries on-site	Entries <250m from site	Entries >250m from site of relevance	Details
				(399m S): Cherwell District Council, Environmental Health Department, Ref. CDC/WOB/006, issued 24 th February 1993
Enforcement and prohibition notices	-	-	-	
Pollution incidents to Controlled Waters, Prosecutions relating to controlled waters, Substantiated pollution incident register, Water Industry Act referrals	-	-	3	<p>Location: Cropredy (148m SE) Authority: Environment Agency, Thames Region Pollutant: Agricultural/General Confirmed As A Pollution Incident 16th March 1990 Incident reference: W1900129 Category 3 Minor Incident</p> <p>Location: Cropredy Lock (214m S) Authority: Environment Agency, Thames Region Pollutant: Miscellaneous - Unknown Confirmed As A Pollution Incident Date unknown Incident reference: W1930304 Category 3 Minor Incident</p>

Data type	Entries on-site	Entries <250m from site	Entries >250m from site of relevance	Details
				<p>Location: Cropredy (408m S)</p> <p>Authority: Environment Agency, Thames Region</p> <p>Pollutant: Unknown Sewage</p> <p>Confirmed As A Pollution Incident</p> <p>27th August 1993</p> <p>Incident reference: W1930464</p> <p>Category 3 Minor Incident</p>
Discharge consents	-	2	15	<p>Castle Marinas Limited (178m N): Environment Agency, Thames Region, Ref. Eprvb3292ae, 23rd May 2022.</p> <p>Domestic Property (180 N): Environment Agency, Thames Region, Ref. CNTW.1349, 30th October 1991.</p>
Registered radioactive substances	-	-	-	
Landfill and waste				
Active landfills	2	-	-	<p>Local authority landfill coverage has been noted by Cherwell District Council and Oxfordshire County Council. However no further details have been provided in relation the age or level of coverage. The EHO have been contacted regarding this uncertainty.</p>
Historic / closed landfills	-	-	-	

Data type	Entries on-site	Entries <250m from site	Entries >250m from site of relevance	Details
Other waste management licences	-	-	-	
Potentially in-filled land (pit, quarry, pond, marsh, river, stream, dock etc)	-	-	-	
Hazardous substances/ industrial land uses				
Control of Major Accident Hazards (COMAH) sites	-	-	-	
Explosives sites, Notification of Installations Handling Hazardous Substances (NIHHS), Planning hazardous substance consents/ enforcements	-	-	-	
Contaminated land Part 2A register entries and notices	-	-	-	
Contemporary trade directory entries	-	3	16	Fiddlers Elbow Grease (201m SE), Cosmetic Manufacturers
				G R Wheeler (222m S), Mechanical Engineers
				Abracardabra Valeting (104m SW), vehicle cleaning services
				Copredy Bridge Cars (334m S), vehicle repair and servicing 334m S)
				Angel Tuning (335m S), vehicle repair and servicing 335m S)

Data type	Entries on-site	Entries <250m from site	Entries >250m from site of relevance	Details
				Gama Cars (335m S), vehicle repair and servicing
				Industrial feature (179m SE): tank
Fuel station entries	-	-	-	
<p><i>Note: Entries have only been included within the table where they are located within a 250m radius of the site or, where they fall outside of this radius but are considered to comprise a significant entry.</i></p>				

3.3 Information from regulatory authorities

3.3.1 Planning records

There are no relevant planning records held by the Local Authority Planning Department which pertain to the site.

3.3.2 Local Authority environmental health department information

A request has been sent to the environmental health department at Oxford County Council. At this time of issuing this report, no response has not been received. Should a response indicate any additional contaminated land uses not previously identified then this report will be updated with their response.

A copy of the correspondence is included in [Appendix D](#).

3.3.3 Site services

Buried utility services and their backfill can provide preferential pathways for gas, vapour or groundwater to migrate along to another part of the site or to a receptor. They can also represent significant constraints to development.

Obtaining a full set of service plans was outside the scope of this report. Services identified on-site during the walkover are detailed in Section 4.

3.4 Site geology

3.4.1 Anticipated geological sequence

Published records (British Geological Survey, 2022) for the area and available historical borehole logs indicate the geology of the site to be characterised by the succession recorded in **Table 5**. There are 2 publicly available BGS historical boreholes located on

or within 250 m of the site, which are presented in [Appendix D](#). They confirm the presence of a shallow made ground overlying an old topsoil and superficial deposit. The underlying bedrock deposits comprise a Lias Limestone lithology.

Table 5 Site geology

Strata	Description	Estimated thickness	Permeability
Charmouth Mudstone Formation	Dark grey laminated shales, and dark, pale and bluish grey mudstones; locally concretionary and tabular limestone beds; abundant argillaceous limestone, phosphatic or ironstone (sideritic mudstone) nodules in some areas; organic-rich paper shales at some levels; finely sandy beds in lower part in some areas.	C. 335m	Permeable – Secondary aquifer
Relevant information sources: BGS Geoindex <input checked="" type="checkbox"/> BGS borehole logs <input checked="" type="checkbox"/> Previous SI reports <input type="checkbox"/>			

3.4.2 Radon

The environmental database report indicates that the site is not located within an ‘Affected Area’. An ‘Affected Area’ is one with 1% or more homes above the radon Action Level of 200 Bq m⁻³. Therefore, the risk of significant ingress of radon into structures on-site is considered to be low and no radon protective measures are considered to be required within new dwellings (or extensions) at the site. Note the site-specific assessment within the environmental database report is at a higher resolution and therefore provides greater detail than that publicly available in the indicative radon atlas at www.ukradon.org.

3.5 Hydrogeology

A summary of the hydrogeological setting of the site, with respect to the anticipated geological sequence set out in Section 3.4 is presented below in **Table 6**.

Table 6 Summary of hydrogeological setting

Condition	Description
Aquifer characteristics	The site is underlain by a Secondary aquifer undifferentiated relating to the Charmouth Mudstone Formation. The presence of low permeability mudstone (comprised of an aggregate of clay and silt-sized particles) at relatively shallow depths beneath the site, while restricting downwards migration, may increase the potential for lateral migration of shallow groundwater (and therefore mobile contamination, if present).
Depth to groundwater and flow	The anticipated depth to the groundwater table is in the order of 1.13 – 1.20 m below ground level estimated from BGS logs. Shallow groundwater in the site

Condition	Description
	<p>area is anticipated to flow in an easterly direction, i.e. towards and in the direction of flow of the Oxford Canal.</p> <p>It is also likely that shallow water may be present in any made ground deposits present on-site.</p> <p>The regional direction of groundwater flow is to the southeast in line with local topography and towards surface waters such as the Oxford Canal and Highfurlong Brook.</p>
Groundwater recharge/attenuation	Most of the site is currently unsurfaced and will therefore infiltrate to ground.
Historical implications for hydrogeology	There are no on-site culverted streams, ponds or drainage features that may provide implications for hydrogeology.
Licensed groundwater abstractions	The environmental database report indicates that there are no current groundwater abstractions within a 1km radius of the site. However, it provides information regarding one abstraction source 208m east of the site. This abstraction at Prescote Manor Farm, was used for general farming and domestic use and is dated back to 1985.
Source protection zones	Information available in the Envirocheck report indicates that the site does not lie within a currently designated groundwater Source Protection Zone (SPZ).

3.6 Hydrology

A summary of the hydrology within the site area is summarised in Table 7.

Table 7 Summary of hydrology in site area

Condition	Description
Surface watercourses/features	<p>The nearest identified surface watercourse/feature to the site is the Oxford Canal and Highfurlong Brook located adjacent to the site; 5 and 80 m to the east of the site. The site walkover survey also identified the presence of a small drainage ditch on the northern border of the site which is fed by the Clattercote reservoir 2.1km north-west of the site.</p> <p>The direction of water travel for the Oxford Canal is towards the south. The canal is 9.5m in width banked by concrete paving blocks. Water levels vary annually and comprise a body of water that is dark green in colour. The water from the canal is also connected to the Copredy Marina to the north of the site. Further south along the canal, the water is intersected by a footbridge in the residential area.</p> <p>The Highfurlong Brook is a narrow watercourse feature which flow south in line with the topography. The watercourse is 2.5m wide and is banked by superficial deposits, grasslands and vegetation. No comments can be made on the quality of the water as it is not clear from satellite imagery, and it was also not encountered on-site during the walkover survey.</p>

Condition	Description
Surface water abstractions	There are no surface water abstractions identified by the environmental database, within a 1 km radius of the site.
Site drainage	Surface drainage from the site appears to be discharged into the Oxford Canal located immediately to the east of the site's boundary. A small drainage ditch was also noted during the walkover, located immediately north of the site's boundary.
Preliminary flood risk assessment	The indicative floodplain map for the area, shows that the site lies within the designated floodplain of the Oxford Canal, Highfurlong Brook and small stream/drainage ditch to the north and west of the site. The risk of flooding each year has been assessed by the EA as moderate –i.e. 1.3% (1 in 75) or less, but greater than 0.5% (1 in 200) (Flood zone 2). A flood risk assessment (FRA) is outside the scope of this report. https://flood-map-for-planning.service.gov.uk/

3.7 Sensitive land uses

Table 8 provides a summary of any environmentally sensitive areas identified within 250 m of the site based on the environmental database report.

Table 8 Environmentally sensitive areas

Feature	Present within 250m of site?	Details	Likely pathways from site?
International designations – Ramsar wetland, Special Area of Conservation (SAC), Special Protection Area (SPA)	No	Designation type, distance and direction from site	No
National designations – Site of Special Scientific Interest (SSSI), National Nature Reserve (NNR), ancient woodland	No	Designation type, distance and direction from site	No
Local designations – Local Nature Reserve, Site of Importance for Nature Conservation (SINC)	No	Designation type, distance and direction from site	No
Nearest high sensitivity development, e.g. residential	n/a	Designation type, distance and direction from site	No

4 SITE RECONNAISSANCE FINDINGS

A site reconnaissance survey was completed on the 5th October 2022 by RSK. The characteristics of the site observed during the walkover and from current ordnance Survey maps are summarised in Table 9.

A site plan is provided in [Figure 2](#) with photographic records included in [Appendix E](#) detailing the main features identified below.

Whilst the walkover summary includes consideration of current operations and housekeeping on the site as potential sources of contamination, it does not constitute a comprehensive environmental audit of the site, as covered under ISO 14001.

Table 9 Site reconnaissance findings

Feature	Description
Physical characteristics	
Access constraints	n/a
Site topography	The site is gently sloping north to south across the site.
Surface cover	A roadway/track runs from the western site boundary (Clayton Road) to the Copredy Waterside and Marina on the north-eastern boundary. This Pathway is approximately 200m in length and 5m wide. The majority of the site is covered by undeveloped farmland.
Site drainage	The site appears to drain directly to ground as the majority of the site is covered with natural ground. However, surface run-off may discharge to the immediately adjacent Oxford Canal.
Surface water	The nearest surface watercourse to the site appears to be the Oxford Canal located adjacent to the site (5 m to the east from the site boundary). A small drainage ditch feature was also noted on the northern boundary of the site. The water observed in the Oxford Canal was dark green in colour and relatively still. Water could not be well observed in the drainage ditch due to vegetation.
Trees and hedges	The site is bounded by hedgerows, trees, and substantial amounts of vegetation. A collection of small trees was also observed on the edges of the track that connects the Copredy Marina to Clayton Road.
Invasive species	Based upon the walkover survey, obvious evidence of Japanese Knotweed or other invasive species has not been identified on-site. However, it should be noted that a detailed survey of the possible presence or absence of invasive species is outside of the scope of investigation. The site visit was undertaken in October and therefore dieback may have occurred.
Existing buildings on-site	No buildings are present on-site.
Retaining walls and adjacent buildings	There are no such structures on or close to the site boundary.

Feature	Description
on or close to site boundary	
Basements on-site	No evidence of existing or infilled basements were observed.
Made ground, earthworks and quarrying	None observed.
Potentially unstable slopes on or close to site	None observed.
Buried and overhead services present	Overhead powerlines were noted in the south of the site running east to west across the site. A manhole cover was also noted in the north of site adjacent to the Copredy marina entrance.
Environmental characteristics	
Underground/ above ground storage tanks and pipework	None observed.
Potentially hazardous materials storage and use	None observed.
Asbestos-containing materials	None observed.
Waste storage	Domestic waste and gas cannister storage at the entrance of the Copredy Marina (off-site)
Fly-tipping	None observed.
Electricity sub-stations/ transformers	There are two existing electrical pylon transformers located on the northern boundary of the site adjacent to the small shed structure besides the Copredy Marina car park and between the overhead powerlines running across the south of the site.
Evidence of possible land contamination on-site	None observed.
Potential off-site sources of ground contamination	None observed.

No potentially significant land contamination or geotechnical issues were identified during the site reconnaissance survey.

5 PRELIMINARY GEOTECHNICAL CONSTRAINTS

5.1 Design class

BS EN 1997-1 defines three different Geotechnical Categories that structures may fall into, which are summarised as follows:

- Category 1: Small and relatively simple structures for which it is possible to ensure that the fundamental requirements will be satisfied on the basis of experience and qualitative geotechnical investigations; with negligible risk
- Category 2: Conventional types of structure and foundation with no exceptional risk or difficult ground or loading conditions
- Category 3: Structures or part of structures, which fall outside limits of Geotechnical Categories 1 and 2. Examples include very large or unusual structures; structures involving abnormal risks, or unusual or exceptionally difficult ground or loading conditions; structures in highly seismic areas; structures in areas of probable site instability or persistent ground movements that require separate investigation or special measures.

Based on the information provided above on the proposed development and in view of the anticipated ground conditions, a Geotechnical Category of 1 has been assumed for the purposes of designing the geotechnical investigation. This should be reviewed at all stages of the investigation and revised where necessary.

5.2 Preliminary geotechnical hazards assessment

A summary of commonly occurring geotechnical hazards associated with the anticipated geology outlined in Section 3.4 above is given in Table 10 together with an assessment of whether the site may be affected by each of the stated hazards.

Table 10 Summary of preliminary geotechnical risks that may affect site

Hazard category	Hazard status based on desk study findings and proposed development		Engineering considerations if hazard affects site
	Could be present and/or affect site	Unlikely to be present and/or affect site	
Sudden lateral changes in ground conditions	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Likely to affect ground engineering and foundation design and construction
Shrinkable clay soils	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Design to NHBC Standards Chapter 4 or similar

Hazard category	Hazard status based on desk study findings and proposed development		Engineering considerations if hazard affects site
	Could be present and/or affect site	Unlikely to be present and/or affect site	
Highly compressible and low bearing capacity soils, (including peat and soft clay)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Likely to affect ground engineering and foundation design and construction
Silt-rich soils susceptible to rapid loss of strength in wet conditions	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Likely to affect ground engineering and foundation design and construction
Running sand at and below water table	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Likely to affect ground engineering and foundation design and construction
Karstic dissolution features (including 'swallow holes' in Chalk terrain)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	May affect ground engineering and foundation design and construction – refer to Section 4.1.2
Evaporite dissolution features and/or subsidence	<input type="checkbox"/>	<input checked="" type="checkbox"/>	May affect ground engineering and foundation design and construction
Ground subject to or at risk from landslides	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Likely to require special stabilisation measures
Ground subject to periglacial valley cambering with gulls possibly present	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Likely to affect ground engineering and foundation design and construction
Ground subject to or at risk from coastal or river erosion	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Likely to require special protection/stabilisation measures
High groundwater table (including waterlogged ground)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	May affect temporary and permanent works
Rising groundwater table due to diminishing abstraction in urban area	<input type="checkbox"/>	<input checked="" type="checkbox"/>	May affect deep foundations, basements and tunnels
Geological faults, fissures and breaklines	<input type="checkbox"/>	<input checked="" type="checkbox"/>	May affect ground engineering and foundation design and construction
Underground mining, including shafts and adits (e.g. coal, mineral)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Likely to require further assessment including potentially special stabilisation measures
Effects of extreme temperature (e.g. cold stores or brick kilns/furnaces)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Likely to affect ground engineering and foundation design and construction

Hazard category	Hazard status based on desk study findings and proposed development		Engineering considerations if hazard affects site
	Could be present and/or affect site	Unlikely to be present and/or affect site	
Existing sub-structures (e.g. tunnels, foundations, basements, and adjacent sub-structures)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Likely to affect ground engineering and foundation design and construction
Filled and made ground (including embankments, infilled ponds and quarries)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Likely to affect ground engineering and foundation design and construction
Adverse ground chemistry (including expansive slags and weathering of sulphides to sulphates)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	May affect ground engineering and foundation design and construction
Site topography	<input type="checkbox"/>	<input checked="" type="checkbox"/>	May affect ground engineering and foundation design and construction
Note: Seismicity is not included in the above table as this is not normally a design consideration in the UK.			

The site geology is comprised of the Charmouth Mudstone Formation. It is a stratified bedrock made up of mudstone with subsidiary calcilutite and limestone and trace ironstone and sandstone. The above lithology is highly variable in regard to its quantities of sands, clays and silts. It is due to these variations that the ground is susceptible to the hazards described in Table 13 above.

6 INITIAL CONCEPTUAL SITE MODEL

In the UK, land contamination is assessed using a risk-based approach taking account of the magnitude (severity of the hazard) and likelihood (probability) of occurrence. A 'receptor' is something that could be adversely affected by contamination (e.g. people, an ecological system, property or a water body). A 'pathway' is a route or means by which a receptor is or could be exposed to or affected by a contaminant. A 'contaminant source' is a hazard but it can only pose a risk to a receptor where a pathway is present. The relationship between sources, pathways and receptors are referred to as a conceptual site model. A risk can only be released where a contaminant source, pathway and receptor are all in place, referred to as a 'pollutant linkage'.

In line with LCRM (Environment Agency, 2021) and BS 10175: 2011 + A2 2017 (BSI, 2017), RSK has used information in the preceding sections to identify hazards (sources of contaminants), receptors that may be impacted and plausible linking pathways. Where all three are present this is termed a potentially complete contaminant linkage and a qualitative risk estimation is made.

6.1 Potential soil, soil vapour and groundwater linkages

6.1.1 Potential sources of contamination

Potential sources of soil and groundwater contamination identified from current activities and the history of the site and surrounding area are presented in Table 11. Ground gas sources are addressed in the next section.

Table 11 Potential sources of soil and groundwater contamination

Potential sources	Contaminants of concern
On-site	
Local Authority Landfill	Local authority landfill coverage has been noted by Cherwell District Council and Oxfordshire County Council. However no further details have been provided in relation to the risk of contamination, age, or level of coverage. The Environmental Health Department have been contacted for further details.
Potential made ground associated with the development of the Copredy Marina roadway running east to west from Clayton Road.	Unknown fill material but potentially including brick, ash and clinker and containing toxic and phytotoxic metals, inorganics, polycyclic aromatic hydrocarbons (PAHs), asbestos
Overhead electricity pylons and transformer (south of the site)	Polychlorinated Biphenyls (PCBs)
Off-site	
Electrical pylon transformer (northern boundary of the site)	Polychlorinated Biphenyls (PCBs)

Potential sources	Contaminants of concern
Vehicle cleaning services (104m southwest)	Petroleum hydrocarbons (petrol/diesel), chlorinated solvents, toxic and phytotoxic metals
Western railway (250m west)	Petroleum hydrocarbons (petrol/diesel), chlorinated solvents, toxic and phytotoxic metals
Sewage works, 650m southeast	Ammoniacal nitrogen, chloride, coliforms and e-coli (faecal coliforms), toxic and phytotoxic metals, inorganics, polycyclic aromatic hydrocarbons (PAHs), asbestos, petroleum hydrocarbons

6.1.2 Sensitive receptors and linking exposure/ migration pathways

Sensitive receptors identified at or in the vicinity of the site that could be affected by the potential sources identified above comprise:

- Future site users – residential users [oral, dermal and inhalation exposure with impacted soil, soil vapour and dust/fibres, ingestion of home-grown produce, inhalation of vapours from groundwater and / or NAPL if present]
- Current/future adjacent site users – residential, commercial, public open space users [migration of contamination via dust/fibre deposition, vapour or groundwater migration combined with inhalation]
- future buildings and services [direct contact with contaminated soils or groundwater and chemical attack]
- future vegetation [direct contact with contaminated soils or groundwater and root uptake leading to phytotoxicity]
- groundwater in Secondary undifferentiated aquifer within the Charmouth Mudstone Formation; nearby drains; potable abstraction and SPZ [leaching from soils/ percolation to aquifer/ lateral migration of dissolved phase/ NAPL]
- surface watercourse (Oxford Canal) and associated surface water abstraction situated 5 m east of the site [site run-off]

Potential linking pathways are show in brackets for each item above.

Please note that construction workers and future maintenance workers have not been identified in the conceptual model as receptors because risks are considered to be managed through health and safety procedures according to the CDM Regulations.

Ecological receptors are only considered within the conceptual model in the context of statutory protected sites.

6.2 Potential ground gas linkages

6.2.1 Ground gas generation potential

Potential ground gas sources identified for the site and surrounding are shown in Table 12.

Table 12 Potential ground gas sources

Potential sources	Indicative ground gas generation potential (CIEH, 2008)	Additional information
On-site		
Natural carbonate soil and strata such as chalk and limestone	Very low	Charmouth Mudstone Formation contains stratified sequences of limestone.
Made ground with low degradable organic content (e.g. up to 5% organic material and no easily degradable waste).	Very low	BGS geology viewer has not mapped made ground on-site. However, it is potentially present where the roadway has been developed between Clayton Road and Copredy Marina.
Local authority landfill coverage*	High	Local authority landfill coverage has been noted by Cherwell District Council and Oxfordshire County Council. However no further details have been provided in relation the risk of contamination, age or level of coverage. The Environmental Health Department have been contacted regarding this uncertainty.
Off-site		
N/A	-	-

Given the anticipated ground conditions set out above, there is potential for ground gas generation, providing there is actually made ground and landfill present. Their presence is however not known at this stage. It should be noted that Inert landfills are shown to have a very low generation potential as stated in BS 8576. However, most sites are never entirely inert, and often records of deposited materials are not found or were not recorded, and careful consideration should be undertaken at this early stage of an assessment. Further characterization through investigation works is required to determine the possible risk.

6.2.2 Preferential pathways for ground gas migration

Credible preferential pathways potentially connecting the source and receptor through vertical and lateral migration are:

- geology of the Charmouth Mudstone Formation which is likely to be relatively permeable;
- building foundations, piled foundations and vibro-stone columns;

- construction joints and cracks within building structure; and
- utility routes and service penetrations into buildings.

6.2.3 Sensitive receptors and linking pathways

Sensitive receptors identified at or in the vicinity of the site that could be affected by the potential ground gas sources identified above comprise:

- future site users – residential users, commercial/ industrial workers [migration and ingress of ground gases into buildings, build-up in confined spaces and explosion/ asphyxiation]
- adjacent site users – residential users, commercial/ industrial workers [migration and ingress of ground gases into buildings, build-up in confined spaces and explosion/ asphyxiation]
- future buildings and services [migration and ingress of ground gases into buildings, build-up in confined spaces and explosion].

The assessment has identified receptors to include building structures and current/ proposed end-users.

Construction workers have not been identified as receptors for the purposes of this assessment. Risks may still be present to construction workers especially where works include the entry into excavations within the ground. Construction workers should undertake appropriate risk assessments and risks should be managed through health and safety procedures and the use of PPE.

6.3 Preliminary risk assessment

The preliminary risk assessment findings and potentially complete contaminant linkages are shown in Table 13 overleaf. The risk classification based on the combination of hazard consequence and probability using a risk matrix from CIRIA C552 (Rudland et al., 2001), a summary of which is included in [Appendix F](#). This relates to Tier 1 preliminary risk assessment in LCRM (Environment Agency, 2021).

Table 13 Risk estimation for potentially complete contaminant linkages

Potential source	Potential receptor	Possible pathway	Likelihood	Severity	Potential risk	Justification
On-site sources						
Made ground (i.e. fill material) Potential Local Authority landfill	Future Users	Ingestion of contaminated soil and dust Inhalation of contaminated dust and potential vapours	Likely	Medium	Moderate	There is the potential for contamination to be present within the made ground and landfill material, however, there is uncertainty regarding the definite presence and the age of the material potentially present. The made ground is likely to relate to construction associated with Cropredy Marina roadway. Ground investigation required
	Future adjacent Site users		Low likelihood	Medium	Moderate / low	
	Vegetation	Uptake of phytotoxic COPCs	Low likelihood	Minor	Low	

Potential source	Potential receptor	Possible pathway	Likelihood	Severity	Potential risk	Justification
On-site sources						
	Water supply pipes	Direct contact and permeation	Low likelihood	Medium	Moderate / Low	<p>Future water supply pipelines are likely to be laid in a designated trench with “clean” backfill, and therefore there is considered to be a low likelihood that any potential contaminants would be in contact with the water supply pipes.</p> <p>Ground investigation required</p>
	Groundwater within underlying Secondary undifferentiated aquifer (Charmouth mudstone Formation) and nearby drains/shallow surface watercourse	Leaching from soils and subsequent vertical and lateral migration of potential COPCs	Low likelihood	Medium	Low	<p>The site is expected to be underlain by Charmouth Mudstone Formation which, if found to comprise predominantly cohesive material (clay and silt rich) may restrict contamination migration to the Secondary undifferentiated aquifer within the formation.</p>
	Future users (residents) / Adjacent site users / Buildings	Migration and accumulation of ground gas	Low likelihood	severe	Moderate	<p>The presence and condition of landfill material is unknown at this stage. There is potential for ground gas accumulation if landfill is present.</p> <p>Ground investigation required.</p>

Potential source	Potential receptor	Possible pathway	Likelihood	Severity	Potential risk	Justification
On-site sources						
Electrical pylon transformers	Future users	Ingestion of contaminated soil and dust	Low likelihood	Medium	Moderate / Low	There is a low likelihood that PCBs may have migrated into soils.
	Future adjacent site users	Inhalation of contaminated dust and potential vapours	Unlikely	Medium	Low	Given that PCBs have very low mobility it is unlikely that any contaminates will migrate to adjacent site users.
	Water supply pipes		Unlikely	Medium	Low	Given that PCBs have very low mobility it is unlikely that any contaminates will migrate to water supply pipes.
	Groundwater within underlying secondary undifferentiated aquifer (Charmouth mudstone Formation) and nearby drains/shallow surface watercourses.	Leaching from soils and subsequent vertical and lateral migration of potential COPCs	Unlikely	Medium	Low	Given that PCBs have very low mobility it is unlikely that any contaminants will migrate to the groundwater.
Off-site sources						
Vehicle cleaning service	Future site Users	Vertical and lateral migration	Unlikely	Medium Low	Low	There is the low likelihood that contaminants may have migrated onto site.

Risk matrix		Consequences			
		Severe	Medium	Mild	Minor
Probability	Highly likely	Very high	High	Moderate	Moderate/low
	Likely	High	Moderate	Moderate/low	Low
	Low likelihood	Moderate	Moderate/low	Low	Very low
	Unlikely	Moderate/low	Low	Very low	Very low

Potentially complete contaminant linkages with a potential risk of moderate or higher identified in Table 13 comprise:

- Future site users – residential users [oral, dermal and inhalation exposure with impacted soil, soil vapour and dust/fibres, ingestion of home-grown produce, inhalation of vapours from groundwater and / or NAPL if present];
- future adjacent site users – residential, public open space users [migration of contamination via dust/fibre deposition, vapour or groundwater migration combined with inhalation];
- future buildings and services [direct contact with contaminated soils or groundwater and chemical attack];
- groundwater in Secondary undifferentiated aquifer within the Charmouth mudstone Formation deposits [leaching from soils/ percolation to aquifer/ lateral migration of dissolved phase/ NAPL etc.]; and,
- Future site users – residential users [migration and ingress of ground gases into buildings, build-up in confined spaces and explosion/ asphyxiation].

These potentially complete contaminant linkages need to be assessed further through appropriate site investigation to target the identified sources of potential contamination and assess the feasibility of identified pathways.

6.4 Data gaps and uncertainties

Key data gaps and uncertainties identified in the CSM at desk study stage include:

- Groundwater depth and flow direction are conceptual at this stage;
- uncertainty regarding the local authority landfill coverage; and
- there are no previous investigations available for the site, therefore no information on actual concentrations of contaminants in soil and groundwater or ground gas at this stage.

7 CONCLUSIONS AND RECOMMENDATIONS

7.1 Geo-environmental assessment

Based on the results of the Preliminary Risk Assessment the contaminant linkages that have been identified to be potentially complete (relevant contaminant linkages) and to require further action are:

- Future site users – residential users [oral, dermal and inhalation exposure with impacted soil, soil vapour and dust/fibres, ingestion of home-grown produce, inhalation of vapours from groundwater and / or NAPL if present];
- future adjacent site users – residential, public open space users [migration of contamination via dust/fibre deposition, vapour or groundwater migration combined with inhalation];
- future buildings and services [direct contact with contaminated soils or groundwater and chemical attack];
- groundwater in secondary undifferentiated aquifer within the Charmouth mudstone Formation deposits [leaching from soils/ percolation to aquifer/ lateral migration of dissolved phase/ NAPL etc.]; and,
- Future site users – residential users [migration and ingress of ground gases into buildings, build-up in confined spaces and explosion/ asphyxiation].

Should unforeseen contamination be encountered during redevelopment then specialist advice should be sought to determine the appropriate course of action.

7.2 Geotechnical assessment

The key findings of the initial geotechnical assessment are as follows:

- Highly compressible and low bearing capacity soils;
- Silt-rich soils susceptible to rapid strength loss in wet conditions;
- running sand at and below water table; and
- high groundwater table (waterlogged ground).

These findings have been detailed based upon information received from the Envirocheck report and BGS database.

7.3 Recommendations

The following recommendations are made for further assessment of the site to investigate the risks identified above and to address remaining uncertainties:

- Determination of local authority landfill coverage; and
- Phase 2 Geo-environmental and Geotechnical Site Investigation.

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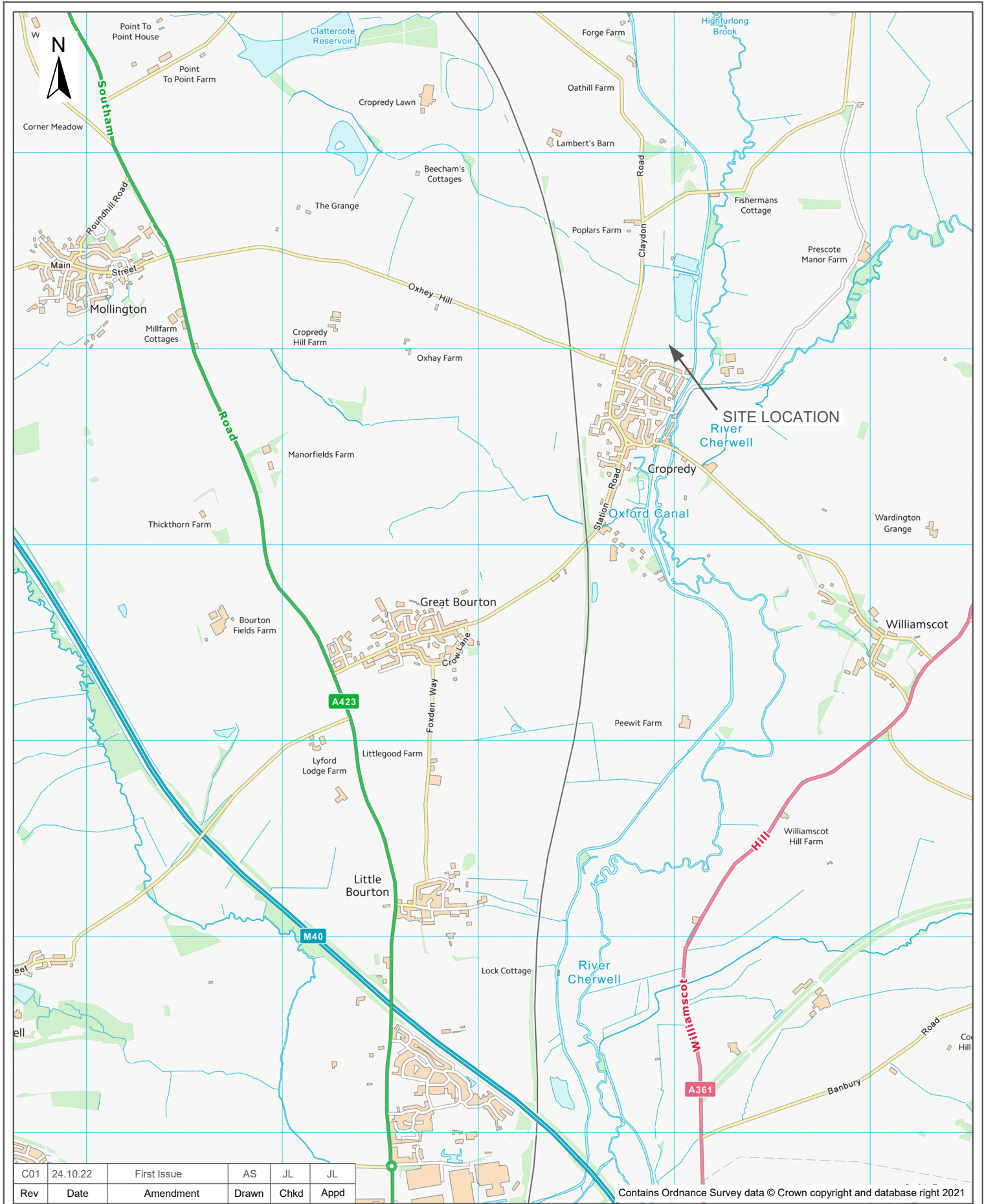
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FIGURES



FIGURE 1 SITE LOCATION PLAN



C01	24.10.22	First Issue	AS	JL	JL
Rev	Date	Amendment	Drawn	Chkd	Appd

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Client	Obsidian Strategic				
Project Name	Land Immediately North of Copredy				
Description	Site Location Plan				

Dimension	Size	Scale	Geolocation	Project ID	Drawing no.	Rev	File name
m	A4	1:25,000	446972,246829	305297	11101	C01	305297-ST-111-SS-D-C-11101-C01



FIGURE 2 SITE LAYOUT PLAN



LEGEND

— Site boundary

Notes:

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Rev	Date	Amendment	Drawn	Chkd	Appd
C01	26.10.22	First Issue	AS	JL	JL



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Client
Obsidian Startegic

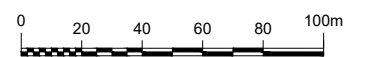
Project Name
Land immediately north of Copredy

Description
Site Layout Plan

Project ID	Drawing no.	Revision
305297	11201	C01

File name
305297-ST-112-SS-D-C-11201-C01

Dimensions	Scale	Size
m	1:2500	A3



APPENDICES

APPENDIX A SERVICE CONSTRAINTS

1. This report and the site investigation carried out in connection with the report (together the "Services") were compiled and carried out by RSK Environment Limited (RSK) for Obsidian Strategic (the "Client") in accordance with the terms of a contract [RSK Environment Standard Terms and Conditions] between RSK and the Client. The Services were performed by RSK with the reasonable skill and care ordinarily exercised by an environmental consultant at the time the Services were performed. Further, and in particular, the Services were performed by RSK taking into account the limits of the scope of works required by the client, the time scale involved and the resources, including financial and manpower resources, agreed between RSK and the Client.
2. Other than that, expressly contained in paragraph 1 above, RSK provides no other representation or warranty whether express or implied, in relation to the Services.
3. Unless otherwise agreed in writing, the Services were performed by RSK exclusively for the purposes of the Client. RSK is not aware of any interest of or reliance by any party other than the Client in or on the Services. Unless expressly provided in writing, RSK does not authorise, consent or condone any party other than the client relying upon the Services. Should this report or any part of this report, or otherwise details of the Services or any part of the Services be made known to any such party, and such party relies thereon that party does so wholly at its own and sole risk and RSK disclaims any liability to such parties. **Any such party would be well advised to seek independent advice from a competent environmental consultant and/or lawyer.**
4. It is RSK's understanding that this report is to be used for the purpose described in the introduction to the report. That purpose was a significant factor in determining the scope and level of the Services. Should the purpose for which the report is used, or the proposed use of the site change, this report may no longer be valid and any further use of or reliance upon the report in those circumstances by the client without RSK 's review and advice shall be at the client's sole and own risk. Should RSK be requested to review the report after the date of this report, RSK shall be entitled to additional payment at the then existing rates or such other terms as agreed between RSK and the client.
5. The passage of time may result in changes in site conditions, regulatory or other legal provisions, technology or economic conditions which could render the report inaccurate or unreliable. The information and conclusions contained in this report should not be relied upon in the future without the written advice of RSK. In the absence of such written advice of RSK, reliance on the report in the future shall be at the Client's own and sole risk. Should RSK be requested to review the report in the future, RSK shall be entitled to additional payment at the then existing rate or such other terms as may be agreed between RSK and the client.
6. The observations and conclusions described in this report are based solely upon the Services which were provided pursuant to the agreement between the Client and RSK. RSK has not performed any observations, investigations, studies or testing not specifically set out or required by the contract between the client and RSK. RSK is not liable for the existence of any condition, the discovery of which would require performance of services not otherwise contained in the Services. For the avoidance of doubt, unless otherwise expressly referred to in the introduction to this report, RSK did not seek to evaluate the presence on or off site of asbestos, invasive plants, electromagnetic fields, lead paint, heavy metals, radon gas, persistent, bioaccumulative or toxic chemicals (including PFAS/ PFOS) or other radioactive or hazardous materials, unless specifically identified in the Services.
7. The Services are based upon RSK's observations of existing physical conditions at the Site gained from a visual inspection of the site together with RSK's interpretation of information, including documentation, obtained from third parties and from the Client on the history and usage of the site, unless specifically identified in the Services or accreditation system (such as UKAS ISO 17020:2012 clause 7.1.6):
 - a. The Services were based on information and/or analysis provided by independent testing and information services or laboratories upon which RSK was reasonably entitled to rely.
 - b. The Services were limited by the accuracy of the information, including documentation, reviewed by RSK and the observations possible at the time of the visual inspection.

- c. The Services did not attempt to independently verify the accuracy or completeness of information, documentation or materials received from the client or third parties, including laboratories and information services, during the performance of the Services.

RSK is not liable for any inaccurate information or conclusions, the discovery of which inaccuracies required the doing of any act including the gathering of any information which was not reasonably available to RSK and including the doing of any independent investigation of the information provided to RSK save as otherwise provided in the terms of the contract between the Client and RSK.

8. The intrusive environmental site investigation aspects of the Services are a limited sampling of the site at pre-determined locations based on the known historic / operational configuration of the site. The conclusions given in this report are based on information gathered at the specific test locations and can only be extrapolated to an undefined limited area around those locations. The extent of the limited area depends on the properties of the materials adjacent and local conditions, together with the position of any current structures and underground utilities and facilities, and natural and other activities on site. In addition, chemical analysis was carried out for a limited number of parameters (as stipulated in the scope between the client and RSK, based on an understanding of the available operational and historical information) and it should not be inferred that other chemical species are not present.
9. Any site drawing(s) provided in this report is (are) not meant to be an accurate base plan but is (are) used to present the general relative locations of features on, and surrounding, the site. Features (intrusive and sample locations etc) annotated on site plans are not drawn to scale but are centred over the approximate location. Such features should not be used for setting out and should be considered indicative only.
10. The comments given in this report and the opinions expressed are based on the ground conditions encountered during the site work and on the results of tests made in the field and in the laboratory. However, there may be conditions pertaining to the site that have not been disclosed by the investigation and therefore could not be taken into account. In particular, it should be noted that there may be areas of made ground not detected due to the limited nature of the investigation or the thickness and quality of made ground across the site may be variable. In addition, groundwater levels and ground gas concentrations and flows, may vary from those reported due to seasonal, or other, effects and the limitations stated in the data should be recognised.
11. Asbestos is often observed to be present in soils in discrete areas. Whilst asbestos-containing materials may have been locally encountered during the fieldworks or supporting laboratory analysis, the history of brownfield and demolition sites indicates that asbestos fibres may be present more widely in soils and aggregates, which could be encountered during more extensive ground works.
12. Unless stated otherwise, only preliminary geotechnical recommendations are presented in this report and these should be verified in a Geotechnical Design Report, once proposed construction and structural design proposals are confirmed.

APPENDIX B SUMMARY OF LEGISLATION AND POLICY RELATING TO LAND CONTAMINATION

Part IIA of the Environmental Protection Act 1990

Part IIA of the Environmental Protection Act 1990 (Part IIA) and its associated Contaminated Land Regulations 2000 (SI 2000/227), which came into force in England on 1 April 2000, formed the basis for the current regulatory framework and the statutory regime for the identification and remediation of contaminated land. Part IIA of the EPA 1990 defines contaminated land 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 significant harm is being caused, or that there is significant possibility of significant harm being caused, or that pollution of controlled waters is being or is likely to be caused'. Controlled waters are considered to include all groundwater, inland waters and estuaries.

In August 2006, the Contaminated Land (England) Regulations 2006 (SI 2006/1380) were implemented, which extended the statutory regime to include Part IIA of the EPA as originally introduced on 1 April 2000, together with changes intended chiefly to address land that is contaminated by virtue of radioactivity. These have been replaced subsequently by the Contaminated Land (England) (Amendment) Regulations 2012, which now exclude land that is contaminated by virtue of radioactivity.

The intention of Part IIA is to deal with contaminated land issues that are considered to cause significant harm on land that is not undergoing development (see Environmental Protection Act 1990: Part 2A Contaminated Land Statutory Guidance, April 2012). This document replaces Annex III of Defra Circular 01/2006, published in September 2006 (the remainder of this document is now obsolete).

Planning Policy

Contaminated land is often dealt with through planning because of land redevelopment. This approach was documented in Planning Policy Statement: Planning and Pollution Control PPS23, which states that it remains the responsibility of the landowner and developer to identify land affected by contamination and carry out sufficient remediation to render the land suitable for use. PPS23 was withdrawn early in 2012 and has been replaced by much reduced guidance within the National Planning Policy Framework (NPPF), reference ISBN: 978-1-5286-1033-9, February 2019.

The new framework has only limited guidance on contaminated land, as follows:

Chapter 11. Making effective use of land

- 117 Planning policies and decisions should promote an effective use of land in meeting the need for homes and other uses, while safeguarding and improving the environment and ensuring safe and healthy living conditions. Strategic policies should set out a clear strategy for accommodating objectively assessed needs, in a way that makes as much use as possible of previously-developed or 'brownfield' land.
118. Planning policies and decisions should:
- c) give substantial weight to the value of using suitable brownfield land within settlements for homes and other identified needs, and support appropriate opportunities to remediate despoiled, degraded, derelict, contaminated or unstable land.

Chapter 15. Conserving and enhancing the natural environment

170. Planning policies and decisions should contribute to and enhance the natural and local environment by:

e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans; and

f) remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate.

Ground conditions and pollution

178. Planning policies and decisions should ensure that:

a) a site is suitable for its proposed use taking account of ground conditions and any risks arising from land instability and contamination. This includes risks arising from natural hazards or former activities such as mining, and any proposals for mitigation including land remediation (as well as potential impacts on the natural environment arising from that remediation);

b) after remediation, as a minimum, land should not be capable of being determined as contaminated land under Part 2A of the Environmental Protection Act 1990; and

c) adequate site investigation information, prepared by a competent person, is available to inform these assessments.

179. Where a site is affected by contamination or land stability issues, responsibility for securing a safe development rests with the developer and/or landowner.

Water Resources Act (WRA)

The Water Resources Act 1991 (Amendment) (England and Wales) Regulations 2009 updated the Water Resources Act 1991, which introduced the offence of causing or knowingly permitting pollution of controlled waters. The Act provides the Environment Agency with powers to implement remediation necessary to protect controlled waters and recover all reasonable costs of doing so.

Water Framework Directive (WFD)

The Water Framework Directive 2000/60/EC is designed to:

- enhance the status and prevent further deterioration of aquatic ecosystems and associated wetlands that depend on the aquatic ecosystems
- promote the sustainable use of water
- reduce pollution of water, especially by 'priority' and 'priority hazardous' substances
- ensure progressive reduction of groundwater pollution.

The WFD requires a management plan for each river basin be developed every six years.

Groundwater Directive (GWD)

The 1980 Groundwater Directive 80/68/EEC and the 2006 Groundwater Daughter Directive 2006/118/EC of the WFD are the main European legislation in place to protect groundwater. The 1980 Directive is due to be repealed in December 2013. The European legislation has been transposed into national legislation by regulations and directions to the Environment Agency.

Priority Substances Directive (PSD)

The Priority Substances Directive 2008/105/EC is a 'Daughter' Directive of the WFD, which sets out a priority list of substances posing a threat to or via the aquatic environment. The PSD establishes environmental quality standards for priority substances, which have been set at concentrations that are safe for the aquatic environment and for human health. In addition, there is a further aim of reducing (or eliminating) pollution of surface water (rivers, lakes, estuaries and coastal waters) by pollutants on the list. The WFD requires that countries establish a list of dangerous substances that are being discharged and EQS for them. In England and Wales, this list is provided in the River Basin Districts Typology, Standards and Groundwater threshold values (Water Framework Directive) (England and Wales) Directions 2010. In order to achieve the objectives of the WFD, classification schemes are used to describe where the water environment is of good quality and where it may require improvement.

Environmental Permitting Regulations (EPR)

The Environmental Permitting (England and Wales) Regulations 2016 (as amended) provide a single regulatory framework that streamlines and integrates waste management licensing, pollution prevention and control, water discharge consenting, groundwater authorisations, and radioactive substances regulation. Schedule 22, paragraph 6 of EPR 2016 states: 'the regulator must, in exercising its relevant functions, take all necessary measures - (a) to prevent the input of any hazardous substance to groundwater; and (b) to limit the input of non-hazardous pollutants to groundwater so as to ensure that such inputs do not cause pollution of groundwater.'

Notes:

- 1. The above information is provided for background but does not constitute site-specific advice*
- 2. The above summary applies to England only. Variations exist within other countries of the United Kingdom*