

SITE SPECIFIC PHASE 1 CONTAMINATION REPORT (PRELIMINARY RISK ASSESSMENT)

■ **Project Name**

James Stiff Cottages, Alms Houses, Rougham

■ **Client**

Havebury Housing

■ **Ref / Date**

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1 BRIEF

Horizon Structures were appointed by Haverby Housing to undertake a Phase I Contaminated Land investigation and Preliminary Risk Assessment (PRA) of the site: **James Stiff Cottage, Almhouse Road, Rougham, IP30 9JL** (hereafter referred to as 'the site').

The proposal is to demolish the rear 1970s structures, construct 7 new dwellings and extend the historic Alms house to the rear.

The purpose of the investigation, comprising of a desktop study and walkover survey, was to:

- Identify any significant potential sources of ground contamination either on the site or in close proximity to it which could have a negative impact on the proposed development.
- Determine whether any further investigation is required to enable the potential risk to human health and controlled waters to be assessed.

The investigation was carried out in accordance with the Environment Agency guidance **Land contamination: risk management** and the NHBC **Guidance for the Safe Development of Housing on Land Affected by Contamination R&D66: 2008 Volume 1**.

Authority to carry out this work was by email from Elliott Bragg of Havebury Homes.

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2 SCOPE

The main elements of the investigation were as follows:

- To collect sufficient information on the site's history, the local environment and current ground conditions to generate a Conceptual Site Model to explore and evaluate the existence and potential impact of any plausible pollutant linkages.
- To utilise the resulting information to undertake a Tier 1 human and environmental risk assessment.
- If appropriate, make recommendations on the extent of further intrusive investigations which may be required to fully establish the condition of the site and the extent of any future remediation / mitigation measures.

3 DESK STUDY

3.1 Sources of information

As part of the desk-based research, Horizon Structures Ltd consulted the following sources of

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information:

- Groundsure Report – produced by emapsite™
- British Geological Survey (BGS) – online
- Environment Agency Ground Water Mapping – online
- Environment Agency Source Protection Zones – online
- Environment Agency indicative flood mapping – online
- Historical maps – emapsite™

3.2 Site description

The site consists of a slim site extending westward away from Almshouse Road, containing the single storey Almshouse, a two-storey flat and a terrace of bungalows to the west. The hard standing access road extends along the south side of the eastern half of the site.

. The site is located midway between Blackthorpe and Rougham Green with amiable land to the north and south and a coppice of trees to the west. See appendix A for site location.

3.3 Site history

Historic maps have been obtained dating from 1882 through to present - see appendix B. These maps show that the site was present at this date (Note the stone shows the original properties were constructed in 1876) surrounded with arable land between the villages of Rougham Green and Blackthorpe and by the early 1900's, the Rectory had been built and trees planted on the site.

Historic mapping shows no change to the site until 1972 when the extension is added. The 1883 map shows no development within the 500m radius with St Mary's Church and the village of Rougham Green within the 750m boundary.

In 1903 map, 3 houses have been constructed within the 750m zone to the south of Rougham. Very little development occurs in the area until 1978 when dwellings are constructed in both Rougham and Rougham Green.

3.4 Geology, hydrogeology and hydrology

According to the British Geological Survey (BGS) online maps, the site is likely to be underlain by **Crag Group** (varied formations). The superficial deposits are likely to be of the **Lowestoft Formation – diamictons**. See appendix C for details.

Due to the nature of the **Lowestoft Formation**, the infiltration (leaching) potential can be high, but

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varies depending on the local lithology. Higher infiltration increases the potential for contamination to spread through the soil.

The MAGIC maps show that the underlying geology is classified as a **Principal / Major Aquifer** (described on the Environment Agency website as *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*). The superficial geology is classified as a **Secondary (undifferentiated) / Minor Aquifer** (described on the Environment Agency website as *an aquifer where it has not been possible to contribute 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 verbal characteristics of the rock type.*) See appendix D for details.

Overall, the vulnerability is classed as **Medium – High**. This represents an overall vulnerability based on the likelihood of a pollutant reaching the ground water and the types of aquifer present as well as the potential impact. It should also be noted that the site falls within an area where solution features may be present that will enable rapid movement of a pollutant. See appendix D for details.

To assess groundwater vulnerability, the Environment Agency divides significant groundwater catchments into four Source Protection Zones (SPZ) which are defined around large and public potable groundwater abstraction sites. The different zones are defined by groundwater travel time to an abstraction.

The SPZ that the site sits within is **Zone II – total catchment** – this zone is defined by the 400-day travel time from a point below the water table. Additionally, this zone has a minimum radius of 250 or 500 metres, depending on the size of the abstraction. The travel time is derived from consideration of the minimum time required to provide delay, dilution and attenuation of slowly degrading pollutants.

According to the Environment Agency's flood map for planning Report generated online (see appendix E) the site is in **flood zone 1** – an area with a low probability of flooding from rivers or the sea.

The long-term flood risk map online indicates that the site is at **very low risk** of surface water flooding (see appendix F). The definition of a very low risk area for surface water flooding is *that each year this area has a chance of flooding of less than 0.1%*.

3.5 Statutory searches – Groundsure Report

To obtain a more detailed understanding of the site, in context of the surrounding environment, Horizon Structures Limited obtained a Groundsure report from the emapsite™. This Report contains information derived from a database containing public record information from the Environment Agency, local authorities and other regulatory bodies. The complete Groundsure report is provided within appendix G.

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The Groundsure report has not identified any potential sources of contamination on-site or within the buffer area.

3.6 Radon

According to the Groundsure Report the site appears to be located in a lower probability Radon area. Therefore, as less than 1% of homes are above the action level for Radon, and no radon protection measures are necessary in the construction of new buildings or residential dwellings.

3.7 Mineral Workings

The site is not situated within an area which is likely to be affected by coal mining.

4 SITE WALKOVER

The site walkover was undertaken 6 January 2021 – see appendix H for photographs. The conditions at the time were sunny and dry.

Access for the site was gained via the driveway from the east of the site adjoining to Almhouse Road. The site consists of predominately lawns to the northern side of the site with dwellings located centrally and a driveway to the south.

The main buildings and extensions are all in good condition with well-maintained gardens around. There is hardstanding forming the parking to the south of the site.

To the north east corner 2 modern twin walled plastic fuel oil tanks are located behind the front garage. No odour of fuel was present and no spillages were evident.

5 CONCEPTUAL SITE MODEL

5.1 Introduction

The conceptual site model is a simplified representation of the ground conditions that exist on the site, which is subsequently used to assess the potential risk to human and environmental receptors. It is described in the Environment Agency **contaminated land: risk management** guidance as *a representation of the characteristics of the site and shows the possible relationships between contaminants, pathways and receptors*.

The conceptual site model is subject to change throughout the progress of the risk management process: as more information is available and the understanding of the site is improved, the model can be refined and updated. The conceptual site model is central to the risk assessment process and must take into account all potential relationships / interactions.

There are four key aspects to the model which are described in the Environment Agency

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contaminated land: risk management guidance:

- Source(s): *a contaminant or pollutant that is in, on or under the land and that has the potential to cause harm or pollution*
- Pathway(s): *a route by which a receptor is or could be affected by a contaminant*
- Receptor(s): *something that could be adversely affected by a contaminant, for example a person, controlled waters, an organism, an ecosystem, or Part 2A receptors such as buildings, crops or animals*
- S-P-R pollutant linkages: *presence and relationship between contaminants, pathways and receptors*

5.2 Potential Sources of Contamination

The principle potential source of contamination on site fuel tank and Boiler Room.

The principle source of contamination off site is from a tank approximately 405m north west.

5.3 Potential Contamination Pathways

The following potential contaminant pathways have been identified:

- Ingestion – future site users could swallow small quantities of soil derived dust originating from soft landscaped areas or disturbed ground
- Dermal absorption – contaminants present within surface or sub-surface soils / fill material can enter the human body through the skin or via open wounds
- Surface water run-off – could allow water soluble or suspended contaminants to migrate laterally
- Buried services – drinking water pipes can be impacted by contaminated ground

5.4 Potential Receptors

The following potential receptors have been identified:

- Current occupants of cottages – people living and working in the dwellings may be exposed to any contaminants present within on site soils and materials, (short term exposure) and could be affected by any contaminants that may exist within surface soils or harmful materials, such as those containing hydrocarbons, in the new development (long term exposure)

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- Future occupants – people living in the new development could be affected by any contaminants that may exist within surface soils or harmful materials.
- Construction workers – workers involved with the site clearance and preparatory work will be exposed to any contaminants present within on-site soils particularly in the vicinity of foundation excavations and demolition of construction materials
- Groundwater – groundwater at depth could be affected by contaminants
- Surface water / water course – surface water and nearby water course receiving the discharge from the treatment works could be affected by pollutants where the treatment works are malfunctioning or in effective

5.5 Plausible Pollutant Linkages

While potential pathways and potentially sensitive receptors have been identified, the main potential source of contamination is the fuel tank in the north east corner.

Based on the present and historic uses of the site, the plausible pollutant linkages are as shown in the table below:

Source		Pathway		Receptor		Risk
<i>On-site</i>						
Fuel Tank	→	<ul style="list-style-type: none"> • Ingestion • Absorption • Leaching discharge through water course 	→	<ul style="list-style-type: none"> • Construction workers • Existing occupants • Future occupants 	→	Fuel oil from fuel tank.
<i>Off-site</i>						
Fuel Tank	→	<ul style="list-style-type: none"> • Ingestion • Absorption • Leaching discharge through water course 	→	<ul style="list-style-type: none"> • Construction workers • Existing occupants • Future occupants 	→	Fuel oil from fuel tank

Table 1: conceptual site model

6 ENVIRONMENTAL ASSESSMENT

6.1 Summary of site conditions

As previously described, the site was formerly arable land with the Alms House constructed in 1876, with no development until the most recent extensions in the early 1970s. Development around the site to the north and south include a similar form of development from arable land to residential properties in the two villages over 250m away.

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6.2 Environmental Risk Assessment

Human Health

It is considered the risk to human health is very low, subject to a careful disposal of the onsite fuel tank.

Controlled Waters

The site is underlain by a Principle / Major Aquifer, associated with the chalk formations at depth, with potentially permeable superficial deposits and is within a source protection zone III; therefore, the geology is considered to be a potential hazard path. However, the risk is considered to be low, subject to the removal of the onsite tank.

Buildings

It is considered that there is no risk to the proposed buildings on site.

Waste Disposal

Horizon Structures Ltd did not undertake any contaminant testing and therefore no samples were submitted. for 'Waste Acceptance Criteria' (WAC) testing. Based on the study obtained so far, it is likely that much of the on-site soil would be classified as 'Inert'. However, materials within the building to be demolished may contain contaminants, in particular it was noted that there may be Asbestos present. Further investigation should determine the nature / composition of the materials and suitable disposal arrangements made.

6.3 Liaison with Regulators

Based on the lack of any significant contamination, and the relatively low risk to groundwater, it is not considered necessary to consult with the Environment Agency at this stage.

7 RECOMMENDATIONS

As a result of the Phase I investigations and Preliminary Risk Assessment carried out to date, Horizon Structures Ltd would make the following recommendations:

- A contractor must carefully remove the onsite fuel tank
- If during demolition work any material is identified as potentially containing asbestos within the existing office extension, boiler house and conservatory, the material must be analysed to confirm the nature / composition and if necessary, a licenced contractor remove and dispose of the material appropriately

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- If, during site clearance or foundation / utility excavations, any evidence of contamination is uncovered then the suspect material should be excavated carefully and stockpiled separately until subsequent chemical analysis can confirm the nature/ composition of the material. Suitable disposal arrangements can then be made

The opinions and recommendations expressed in this report are based on the results of desk-based research.

APPENDIX A:

SITE LOCATION

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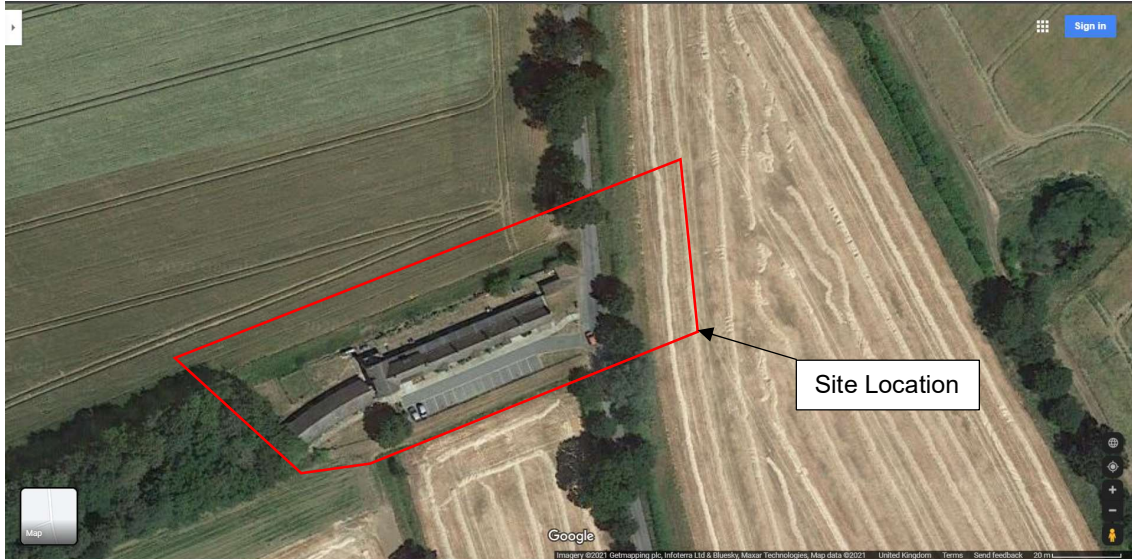


Figure 1: site location (GoogleMaps)

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APPENDIX B:

HISTORIC MAPS

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APPENDIX C:

BRITISH GEOLOGICAL SURVEY

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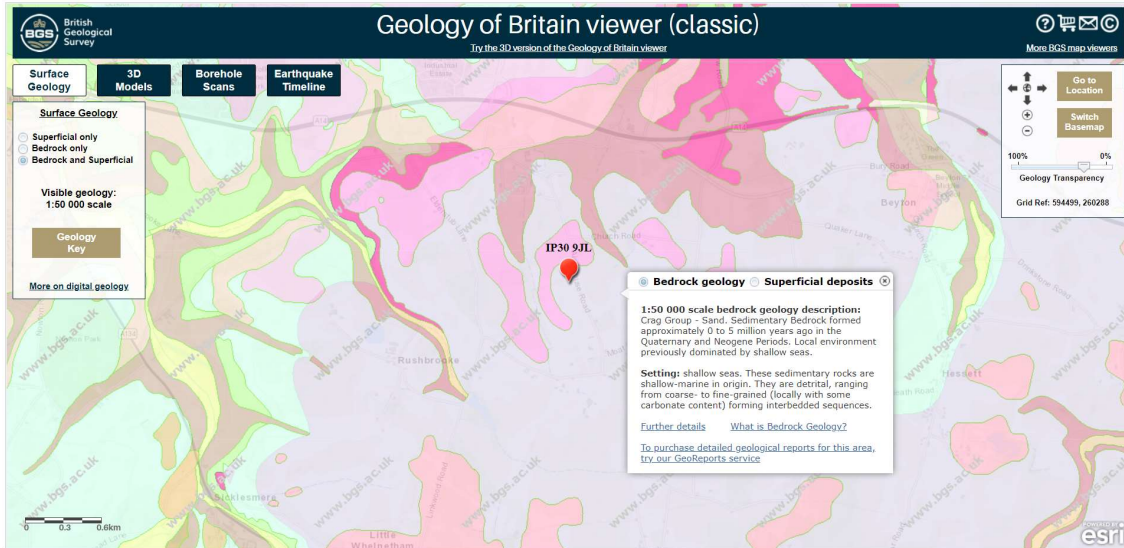


Figure 2: BGS - bedrock geology

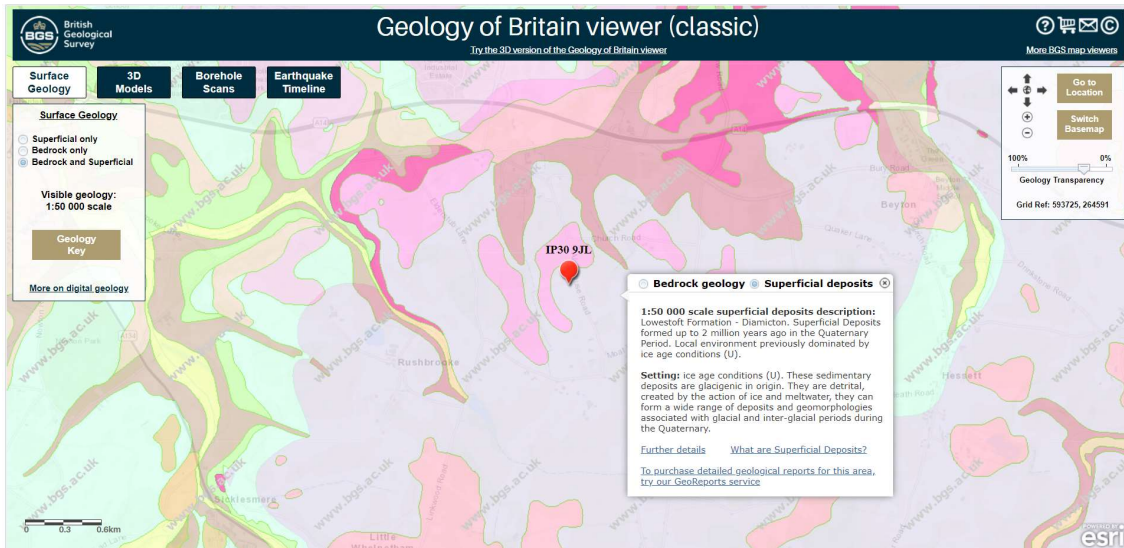
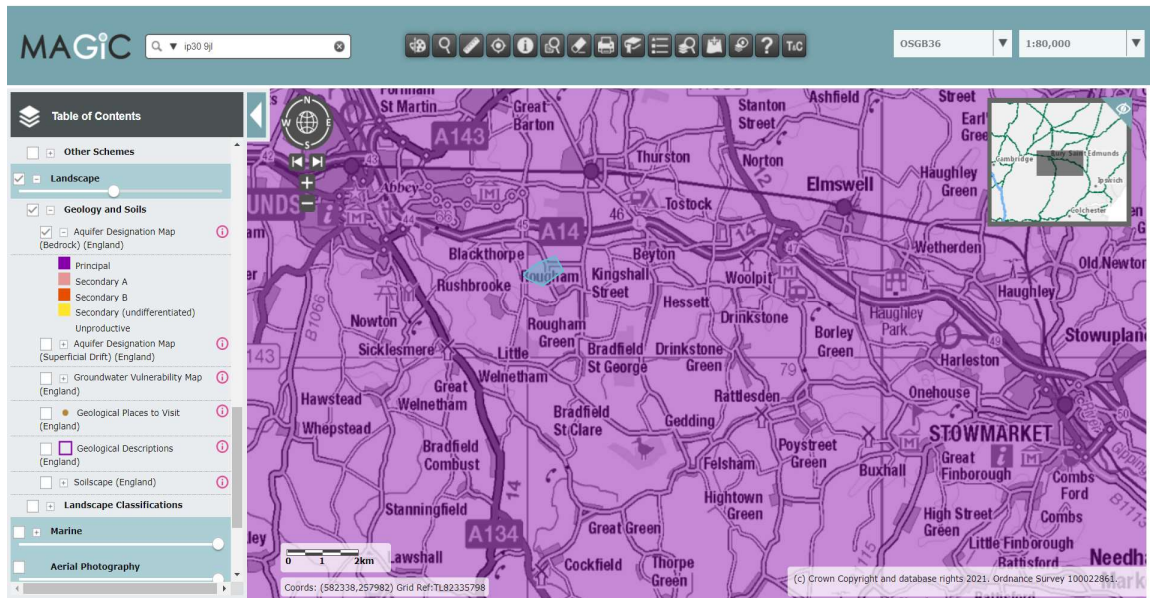
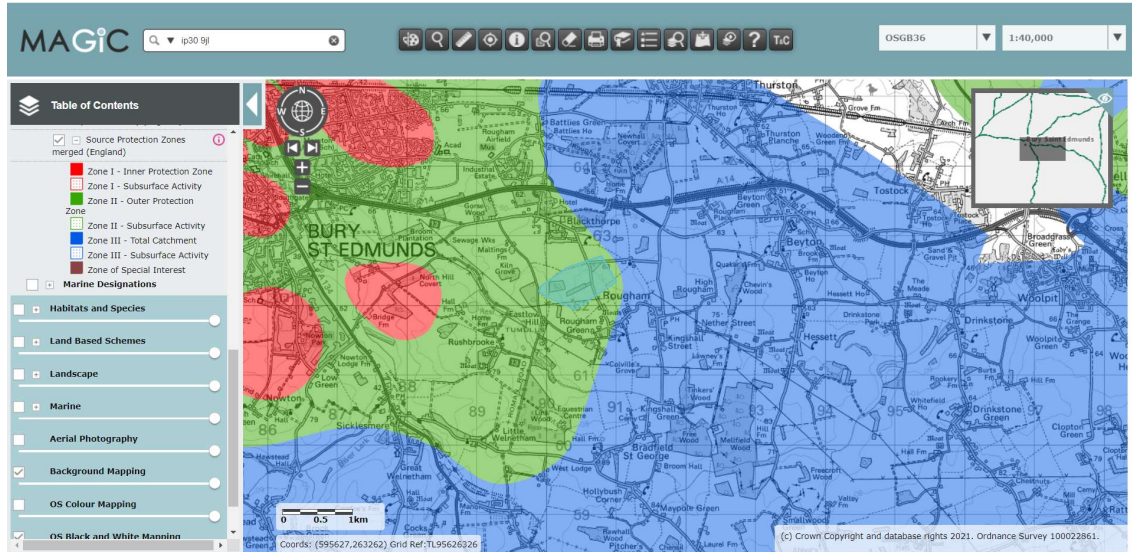


Figure 3: BGS - superficial deposit geology

APPENDIX D:

MAGIC MAP INFORMATION

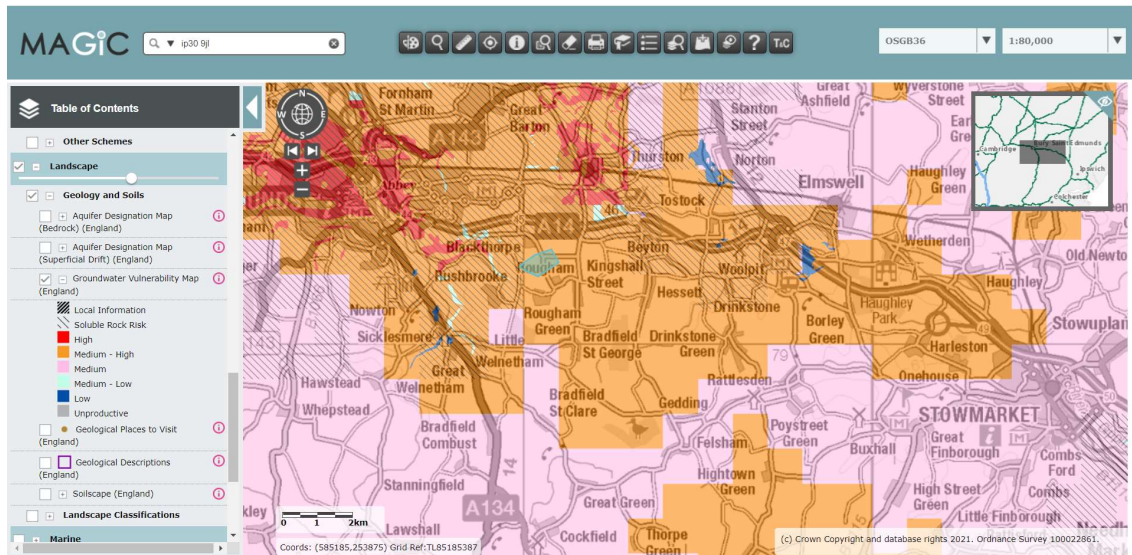
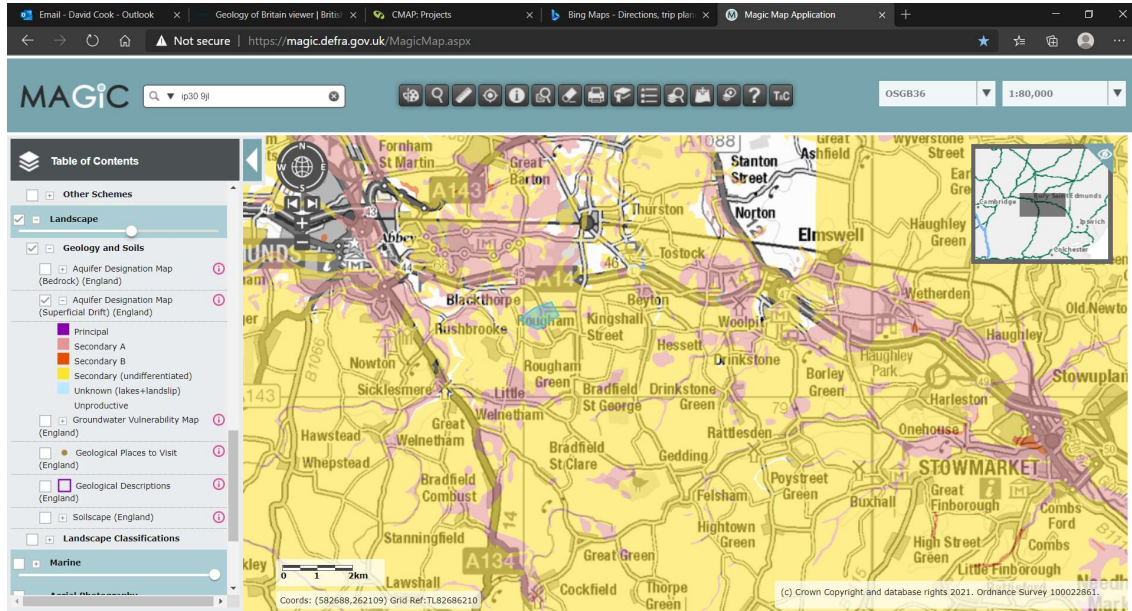
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APPENDIX E:

EA FLOOD MAP FOR PLANNING REPORT

APPENDIX F:

LONG TERM FLOOD RISK

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Figure 4: long term flood risk (surface water)

APPENDIX G:

GROUNDSURE REPORT

APPENDIX H:

PHOTOGRAPHS

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Photograph 01:



Photograph 02

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Photograph 03



Photograph 04

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Photograph 05



Photograph 06

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Photograph 07



Photograph 08:

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Photograph 09