

Flood Risk Assessment for the Development at Knights Lodge, Knight's Lane, Bretby , Burton on Trent DE15 0RD

for:

Willshee's Waste & Recycling Ltd, 22 Granary Wharf, Wetmore Road, Burton on Trent DE14 1DU

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Prepared by:

Dominic Larkins
BSc (Hons) FGS
Geo-environmental Engineer

Approved by:

Dan Edwards
MEng CEng MICE
Director

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Appendix II	Fluvial Flood Maps
Appendix III	Pluvial Flood Maps
Appendix IV	Reservoir Flood Map
Appendix V	General Conditions

1. EXECUTIVE SUMMARY

- 1.1 This flood risk assessment has been prepared on the instruction of Willshee's Waste & Recycling Ltd to address the flooding risk for the development of eight holiday cabins and a swimming pool at Knights Lodge, Bretby, Burton on Trent. At the time of writing this report the site comprised a parcel of land, with eight single storey holiday cabins and a swimming pool (currently under construction).
- 1.2 The site lies in fluvial flood zone 1. The Environment Agency extent of flooding from rivers or sea (appendix II) show that the site is at very low risk of fluvial flooding (less than 0.1% chance of flooding).
- 1.3 The site is also at a very low risk of surface water flooding. In accordance with the South Derbyshire Strategic Flood Risk Assessment, the site is at a low risk of groundwater flooding. Given the topography of the site, there is a medium risk of overland flooding, however based on the topography of the site, it is unlikely significant pooling of flood water will occur.
- 1.4 To reduce the risk from overland flooding, perimeter drains have been installed around each holiday cabin, in addition the finished floor levels are raised 200mm above ground level, therefore the risk from overland flooding can be reduced to low.
- 1.5 The proposed development is classified as a more vulnerable development by the Flood Risk Vulnerability Classification (Annex 3) in the National Planning Policy Framework (NPPF). Therefore, in line with the flood risk vulnerability and flood zone compatibility table (table 3) in the NPPF, the development is appropriate in a flood zone 1.
- 1.6 A drainage strategy has been produced by PRP UK Ltd (Ref:81270 Drg No: 105 P8 dated July 2018). For full details of the proposed surface water drainage system to be constructed, reference should be made to the above drainage strategy. In summary surface water runoff will flow into the newly formed soakaway basin.

2. **INTRODUCTION**

- 2.1 This flood risk assessment has been prepared on the instruction of Willshee's Waste & Recycling Ltd to address the flooding risk for the development of eight holiday cabins and a swimming pool at Knights Lodge, Bretby, Burton on Trent. At the time of writing this report the site comprised a parcel of land, with eight single storey holiday cabins and a swimming pool (currently under construction).
- 2.2 The purpose of the report is to establish the level of risk that exists for a flooding event to affect the site. Any increased flood risks to the surrounding area following the construction of the proposed development will be identified. The report will also outline measures that can reasonably be put in place to reduce the effects, should flooding occur, to acceptable levels based on the identified risk.
- 2.3 This assessment generally follows the principles as laid down in National Planning Policy Framework and PPS25. Although PPS25 has been superseded by the National Planning Policy Framework (NPPF), it still contains measures that are recognised as needing to be followed.
- 2.4 The general conditions contained in appendix V are applied to this report and it should be read and construed accordingly.
- 2.5 Appendices to the report are as follows:

Appendix I	Site Plans
Appendix II	Fluvial Flood Maps
Appendix III	Pluvial Flood Maps
Appendix IV	Reservoir Flood Map
Appendix V	General Conditions

3. SITE DESCRIPTION AND LOCATION

- 3.1 The site is located to the east of Knights Lane, Bretby. Grid reference easting: 429505, northing: 323736 denotes the approximate centre of the site. At the time of writing this report the site comprised a parcel of land, with eight single storey holiday cabins and a swimming pool (currently under construction).
- 3.2 The site is approximately rectangular in shape and occupies an area of approximately 0.9ha. The surrounding area is made up of agricultural land. Site levels dip from south east to north west, with levels in the south east in the region of 122.2mAOD, with levels in the north east in the region of 112mAOD.
- 3.3 Summary details of the site boundaries and adjacent land use are:

Boundary	Boundary Construction	Adjacent Land Use	Proximal Land Use
North	Fence	Highway	Agricultural land
East	No boundary	Commercial (holiday cabins)	Agricultural
South	No boundary	Agricultural	Agricultural
West	No boundary	Agricultural	Agricultural

4. DEVELOPMENT

- 4.1 The site is comprised of eight holiday cabins, together with a swimming pool.
- 4.2 As the purpose of the development is for commercial holiday homes, the development will be classified as a 'more vulnerable' development by the Flood Risk Vulnerability Classification (Annex 3) in the National Planning Policy Framework (NPPF).

5. **SEQUENTIAL AND EXCEPTION TESTS**

As the site is located in a flood zone 1, a sequential test is not required.

6. **ANALYSIS OF RISK**

6.1 Introduction

- 6.1.1. The source pathway receptor model will be used to analyse the likely risk of flooding affecting the site and the development.
- 6.1.2. The sources will be investigated and their risk of affecting the development assessed. Those that have a low or negligible risk of affecting the site will not need to be considered further.
- 6.1.3. Those sources with a medium or high risk of affecting the site will be considered further in terms of their pathway to the site. Where possible the pathway risk to the receptors will be reduced from medium or high risk to low or negligible risk.
- 6.1.4. The residual medium or high risks to the receptors will be managed to ensure that the users of the development and their possessions and property are not at a greater than a low risk of being affected.

6.2 Sources of Flooding

The possible sources of flooding within mainland England are generally taken to be:

- Fluvial (rivers)
- Tidal (sea or estuary)
- Groundwater
- Overland
- Infrastructure failure
- Pluvial (surface water flooding)

6.3 Fluvial Flooding

There are no notable fluvial networks within a suitable distance of the site. With reference to the Environmental Agency Fluvial flood maps, the site is at a very low risk of fluvial flooding.

6.4 Tidal Flooding

The site is approximately 100 kilometres from the sea, with the site level between 112m and 122m above sea level. The risk of tidal flooding affecting the site is therefore negligible.

6.5 Groundwater Flooding

The Environmental Agency map has no results for groundwater flooding. According to the South Derbyshire Strategic Risk Flood Risk Assessment, groundwater flooding within this area is deemed as low. No groundwater was encountered during the excavation of several trial pits conducted on Thursday 13 January 2022, therefore its present groundwater is likely to exist at depths greater than 2.50m. Based on the above, the risk ground groundwater flooding is deemed to be low.

6.6 Surface Water Run off (Pluvial Flooding)

With reference to the Environment Agency surface water flood map (appendix III), the risk of surface water flooding affecting the site is very low. Areas deemed to be at very low risk of pluvial flooding have a chance of flooding of less than 0.1%.

6.7 Infrastructure

Burst water mains are unlikely to affect the site as the water will be channelled away from the site via drainage ditches along Knight's Lane; in addition the site is above road level. With reference to the map for reservoir flooding (appendix IV), the site is located outside the maximum extent of flooding from reservoirs. Therefore, the risk from reservoir flooding is negligible.

6.8 Overland Flooding

- 6.8.1. Site levels to the south east are approximately 10m above site levels to the north west. During periods of heavy rainfall, overland flows could possibly affect the holiday cabins and the swimming pool.
- 6.8.2. Given the topography of the site and the soft landscaping between each holiday cabin, overland flooding would likely move in a south east to north westerly direction, affecting all holiday cabins and the swimming pool. Overland flooding would flow towards Knight's Lane and into nearby drainage ditches and agricultural fields. Site levels will prevent significant pooling of overland flood water.
- 6.8.3. Based on the above, the risk from overland flooding is deemed to be medium, however flood reliance measures, in the form of perimeter drains and raised floor levels have been constructed, therefore the risk from overland flooding can be reduced to low.

6.9 Pathways

From analysing the above sources overland flooding has been identified as being the most probable cause of flooding. The possible pathways for flooding affecting the site need not be considered further.

6.10 Receptors

The receptors will include the users of the site. As the development has not significantly altered the topography of the site, the development will not increase the risk of overland flooding to the surrounding area.

6.11 Outcome of Risk Analysis

Source	Risk	Population at Risk	Mitigation Measures	Residual Risk
Fluvial	Very Low	Site users	None required	Very low
Tidal	Negligible	N/A	None required	Negligible
Groundwater	Low	Site users	None required	Low
Surface water run off (pluvial flooding)	Very Low	Site users	None required	Very low
Infrastructure	Very low	Site users	None required	Very low
Overland Flooding	Medium	Site users	Perimeter drains installed and floor levels raised by 200mm.	Low

6.11.4. To reduce the risk from overland flooding perimeter drains have been installed around each holiday cabin. In addition, the finished floor levels have been raised by 200mm, this will sufficiently reduce the risk from overland flooding.

7. SURFACE WATER DRAINAGE SYSTEM

A drainage strategy has been produced by PRP UK Ltd (Ref: 81270 drg no: 105 P8 dated July 2018). For full details of the proposed surface water drainage system to be constructed, reference should be made to the above drainage strategy. In summary surface water runoff will flow into the newly formed soakaway basin.

8. GEOLOGY

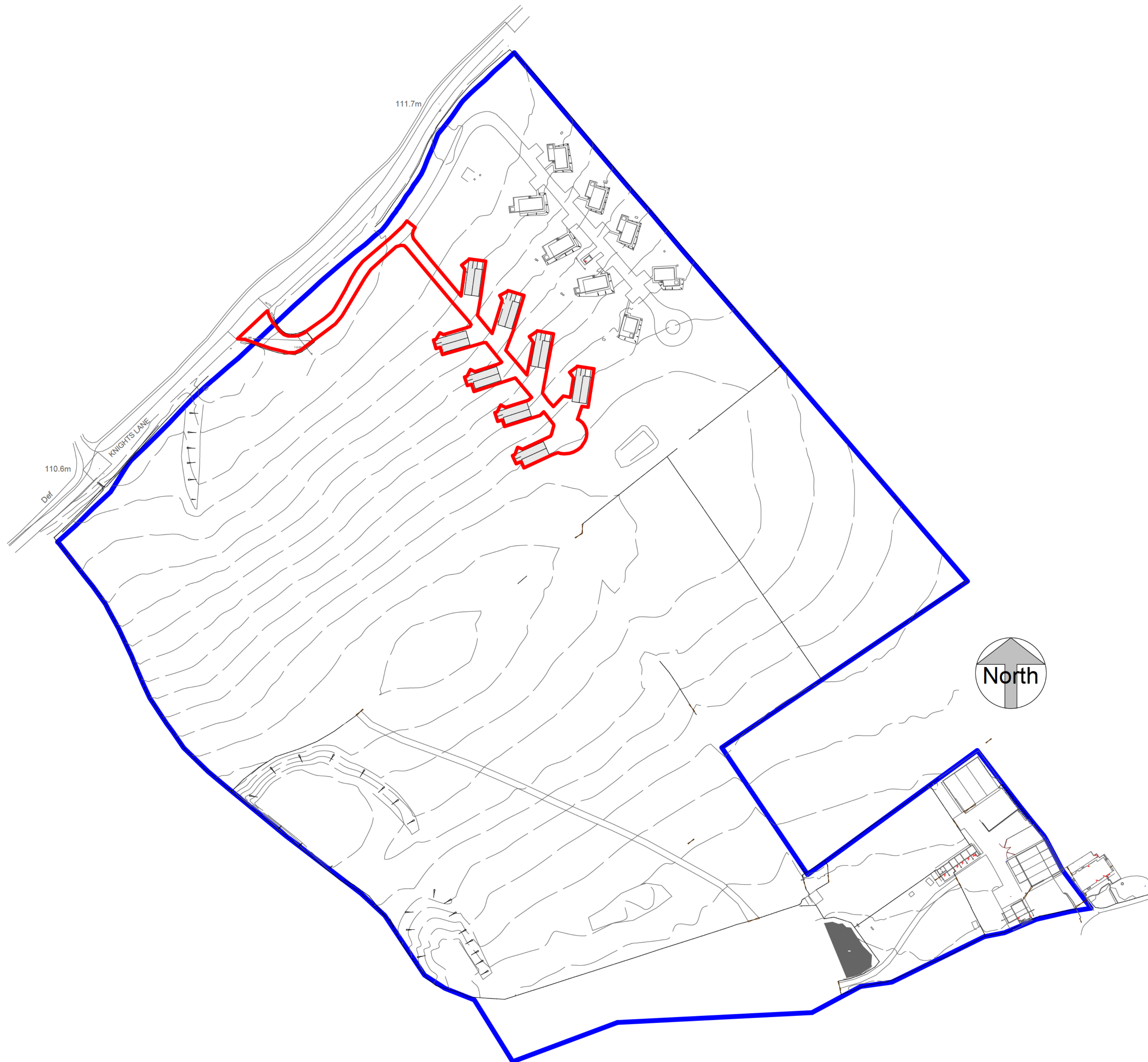
- 8.1 Within the accuracy of the available geological information (British Geological Survey (BGS) Geology of Britain at a scale of 1:50,000) the solid geology beneath the site is indicated to comprise the Tarporley Siltstone Formation, described as interbedded siltstone, mudstones and sandstones. No superficial deposits are recorded beneath the site.
- 8.2 On Thursday 13 January 2022, three trial pits were conducted to determine the feasibility of soakaways. In summary the weathered Tarporley Siltstone Formation was encountered to the bases of all trial pits. The infiltration testing conducted within one of the trial pits, in summary water levels fell by 42cm in 390 minutes, returning a rate of $1.06 \times 10^{-5} \text{m/s}$.

9. **CONCLUSIONS**

- 9.1 The site lies in fluvial flood zone 1. The Environment Agency extent of flooding from rivers or sea (appendix II) show that the site is at very low risk of fluvial flooding (less than 0.1% chance of flooding).
- 9.2 The site lies in fluvial flood zone 1. The Environment Agency extent of flooding from rivers or sea (appendix II) show that the site is at very low risk of fluvial flooding (less than 0.1% chance of flooding).
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- 9.4 A drainage strategy has been produced by PRP UK Ltd (Ref:81270 Drg No: 105 P8 dated July 2018). For full details of the proposed surface water drainage system to be constructed, reference should be made to the above drainage strategy.
- 9.5 To reduce the risk from overland flooding, perimeter drains have been installed around each holiday cabin, in addition the finished floor levels are raised 200mm above ground level, therefore the risk from overland flooding can be reduced to low.
- 9.8 Provided the above are fully taken into account in the detailed design, the development should be allowed to proceed.

APPENDIX I

SITE PLAN



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bi
Design
Architecture

79 HIGH STREET, REPTON,
DERBYSHIRE, S80 6DP
T 01843 774082

114 HIGH STREET, BUTTON
SOLDHAM, W12 1UJ
T 01753 354 8255

ENQUIRIES@BIDESIGN-ARCHITECTURE.CO.UK

WWW.BIDESIGN-ARCHITECTURE.CO.UK

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Project: Proposed Holiday Lodges at

Address: Knights Lodges, Bretby,
Burton-on-Trent, DE15 0RT

Client: Mr Willshee

Drawing: Site Location Plan

Job Ref: I5GOW Drawing No: I5

Drawn By: AM Checked By: DB

Scale: 1:1250

Paper size: A1 Date: 25/05/2021

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bi Design Architecture
ENQUIRIES@BIDESIGN-ARCHITECTURE.CO.UK WWW.BIDESIGN-ARCHITECTURE.CO.UK
PLEASE NOTE: USE FIGURED DIMENSIONS ONLY. CONTRACTOR TO CHECK ALL LEVELS AND DIMENSIONS ON SITE PRIOR TO WORKS COMMENCING AND REPORT ANY DISCREPANCIES TO BI DESIGN ARCHITECTURE.

HEAD OFFICE:
79 HIGH STREET, REPTON,
DERBYSHIRE, S80 6DP
T 01843 774682

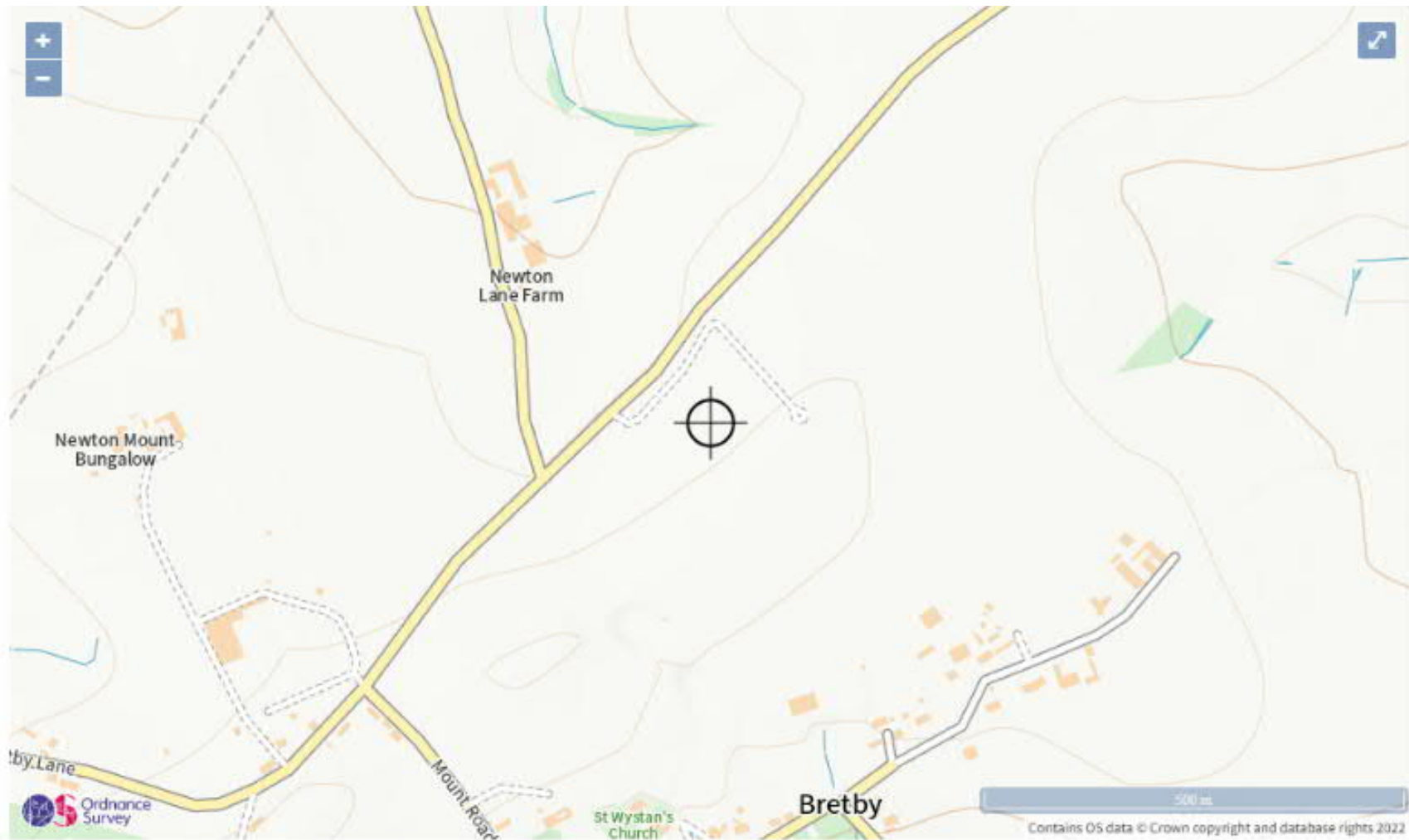
HEAD OFFICE - SOUTH:
41A HIGH STREET, BUTTON
SOUTHAMPTON, SO12 1JZ
T 01703 354 8255

Project: Proposed Holiday Lodges at
Address: Knights Lodges, Bretby,
Burton-on-Trent, DE15 0RT
Client: Mr Willshee
Drawing: Proposed - 1 to 200 Site Plan

Job Ref: I5GOW Drawing No: 13
Drawn By: AM Checked By: DB
Scale: 1:200
Paper size: A1 Date: 25/05/2021

APPENDIX II

FLUVIAL FLOOD MAPS



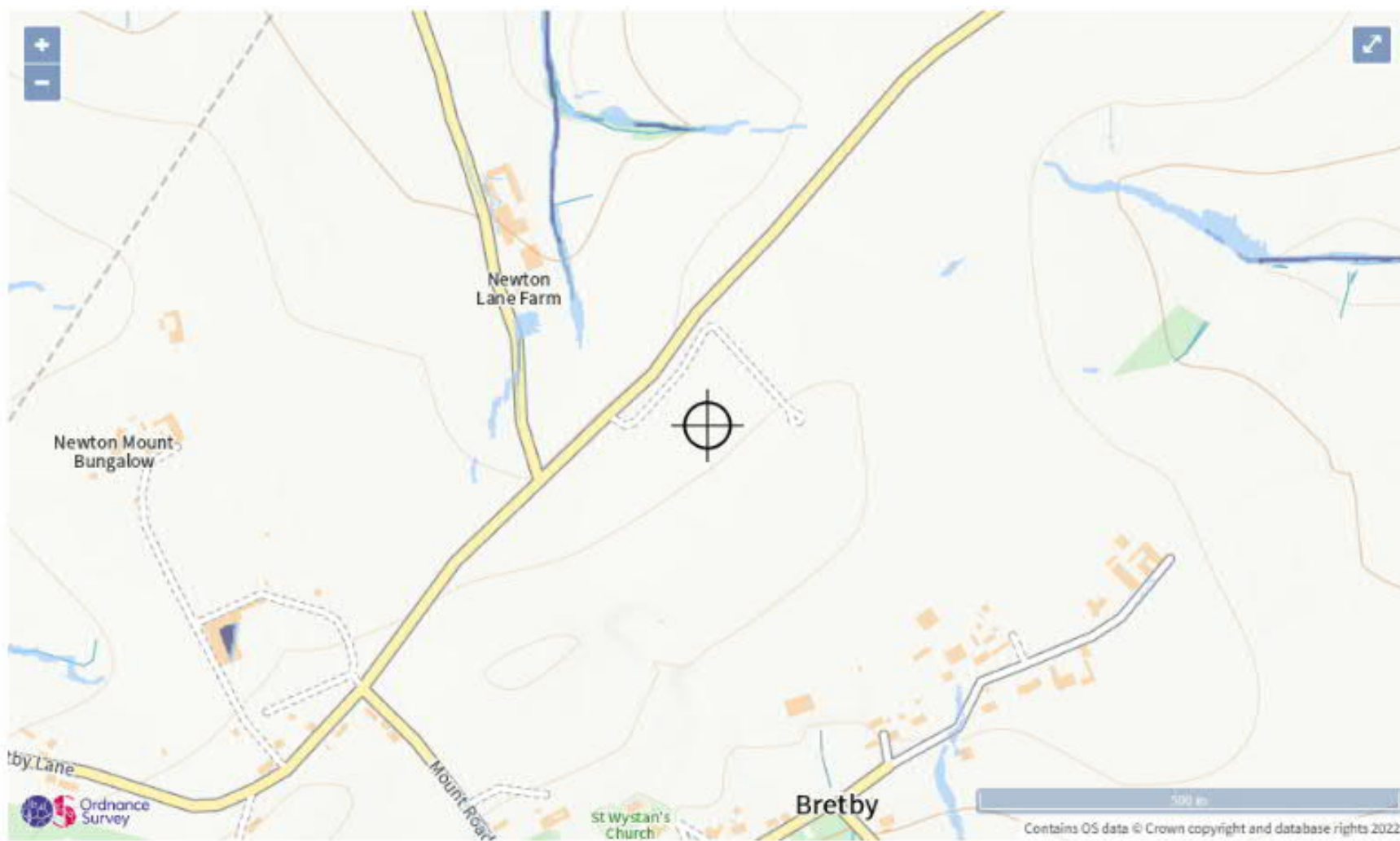
Extent of flooding from rivers or the sea

● [High](#) ● [Medium](#) ● [Low](#) ● [Very low](#) ⊕ Location you selected

Environmental Agency Flood Map: Fluvial (**Source:** <https://check-long-term-flood-risk.service.gov.uk/map?easting=429505&northing=323736>)

APPENDIX III

PLUVIAL FLOOD MAPS



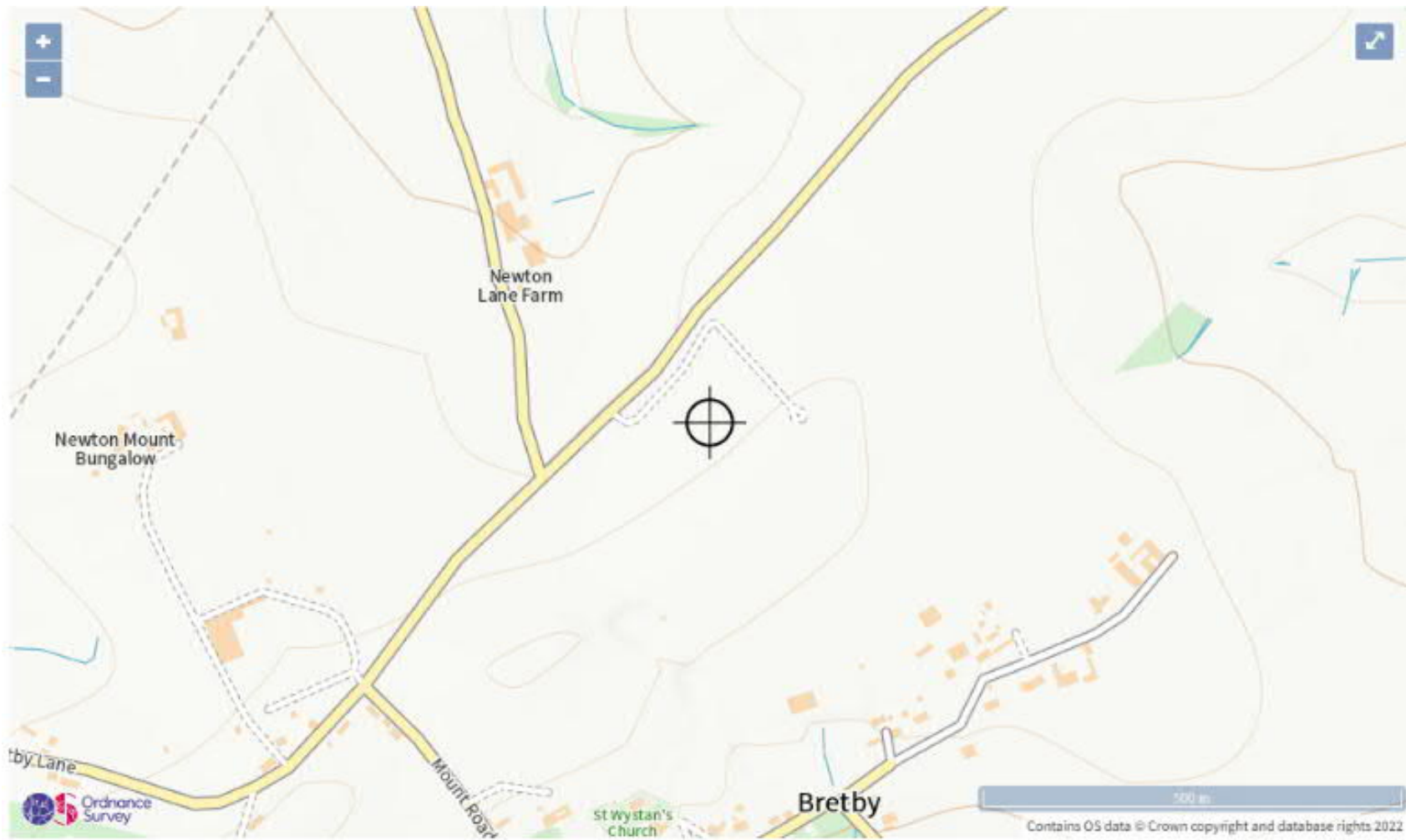
Extent of flooding from surface water

● High ● Medium ● Low ○ Very low ⊕ Location you selected

Environmental Agency Flood Map: Pluvial (**Source:** <https://check-long-term-flood-risk.service.gov.uk/map?easting=429505&northing=323736>)

APPENDIX IV

RESERVOIR FLOOD MAPS



Maximum extent of flooding from reservoirs:

● when river levels are normal ● when there is also flooding from rivers ⊕ Location you selected

Environmental Agency Flood Map: Reservoirs (**Source:** <https://check-long-term-flood-risk.service.gov.uk/map?easting=429505&northing=323736>)

APPENDIX V**GENERAL CONDITIONS**

1. This report has been prepared and written specifically for the client named in the introduction and is exclusively for his/her/their benefit. No reliance may be placed in the contents of this report by any third party except with the express agreement of the original client and the written agreement of PRP. Such written agreement may require the payment of an additional fee.
2. This report has been prepared and written in the context of the proposals for the development of the site as stated by the client and will not be valid in a differing context. Furthermore, new information, improved practices, or legislation may necessitate alteration to the report in whole or in part after its submission. Therefore, with any change in circumstances or after the expiry of one year from the date of this report, it should be referred to us for re-assessment.
3. There may also be special conditions appertaining to the site which were not revealed by the investigation and which will not, therefore, have been taken into account in this report. Any assessments may be subject to amendment in the light of additional information becoming available.
4. Whilst an opinion may be expressed or implied in this report on possible configurations or on the possible presence of features based either visual, verbal or published evidence, this is for guidance only and no liability can be accepted for the accuracy of such opinions.
5. Comments on groundwater conditions will have been based on observations made only at the time of any investigation or published data unless otherwise stated. It should be noted, however, that groundwater levels vary due to seasonal and other effects.
6. This report is not a site categorisation, and hazards could occur which have not been detected.
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8. Where indicated reliance has been placed on data supplied by the environment agency and the strategic flood risk assessment for the area available at the time of writing this report. No liability can be entertained by PRP if this data later proves to be inaccurate or in any way incomplete.