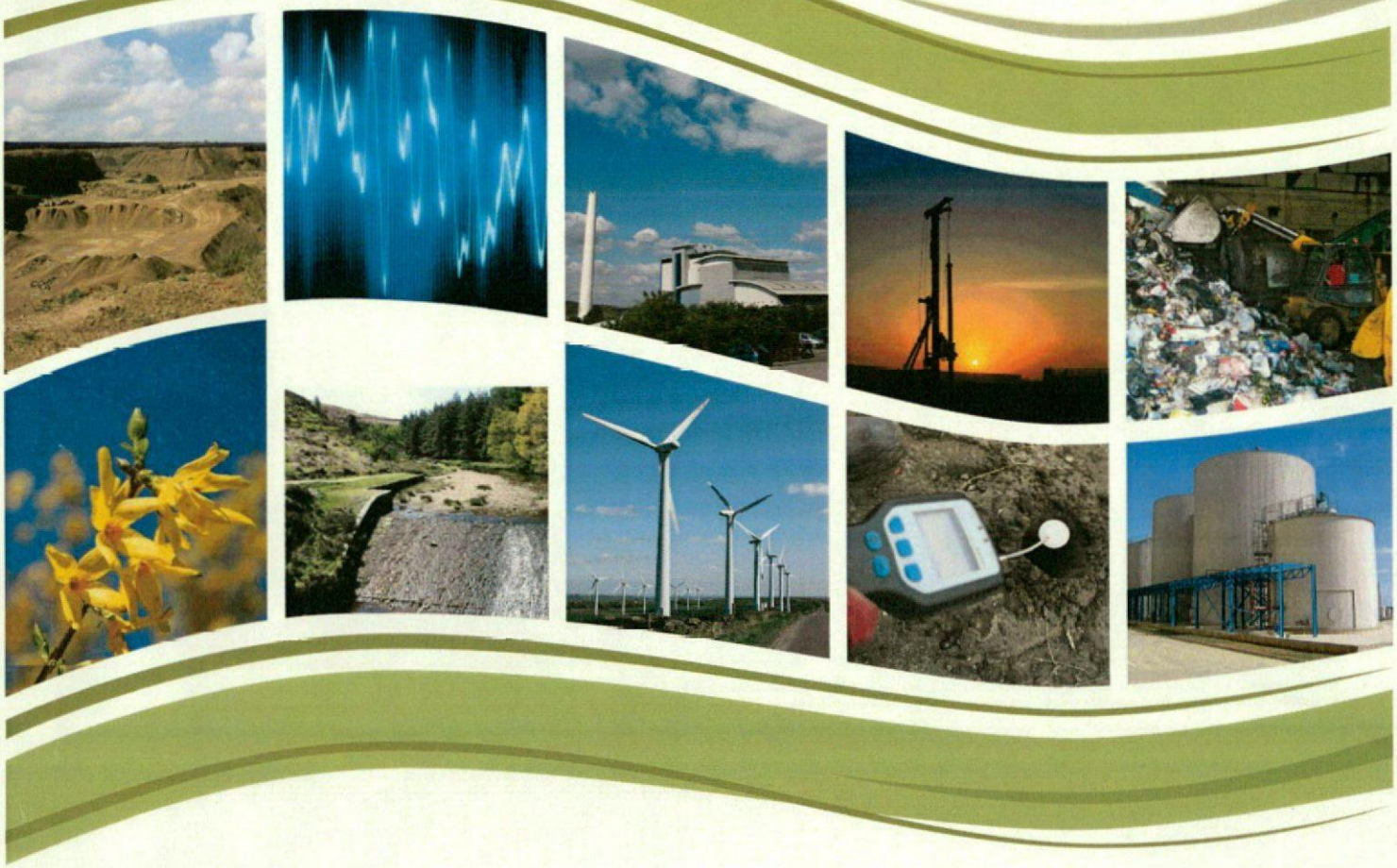
enzygo
environmental consultants



NPPF: Flood Risk Assessment

Old Mill Lane, Thurgoland

Mr Doug Sanderson

SHF.1514.001.HY.R.001.A

'Experience and expertise working in union'

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Status:	Final
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Executive Summary

This report presents an FRA in accordance with the NPPF and PPG ID: 7 guidance, for a proposed single residential dwelling within infill land, located on land south of Old Mill Lane, Thurgoland, South Yorkshire.

The FRA has demonstrated the following:

- The Site is 0.09 hectares (ha) in area and is currently used as an allotment.
- The River Don conveys flows in an easterly direction along the southern boundary of the Site.
- The risk of flooding is assessed as followed:
  - The risk of fluvial flooding is assessed as negligible to high, across the Site.
  - The risk of surface water flooding is assessed as negligible to high, across the Site.
  - The risk of flooding from all other sources is assessed as negligible.
- Flood risk can be mitigated to a negligible level through the following approach:
  - Sequentially develop the Site, limiting the built development to Flood Zones 1 and 2 (low to medium risk).
  - Provide an 8m easement free from development along the southern boundary, adjacent to the River Don for inspection and maintenance purposes.
  - Set finished floor levels above the 1 in 1000-year modelled flood levels and set a threshold above external levels.
  - Access/egress will be provided to the front of the property to Old Mill Lane, which is located outside the mapped extent of fluvial (river) and surface water flooding.
  - The loss of floodplain would be negligible based on the scale of development (single dwelling within infill land). Due to the size of the Site, floodplain compensation is not feasible. The lower ground floor could be utilised as a garage (similar to the neighbouring property), which would accept flood water during a flood event.
  - New owners of the property should register the property to Floodline.
  - Adoption of a surface water management strategy.
- The proposed residential development is classified as 'more vulnerable', which is considered acceptable in Flood Zones 1 and 2. Subject to mitigation measures, the Sequential Test will be passed, and the Exception Test would not be required.

The FRA has considered the potential impact of the development on surface water runoff rates, given the increase in impermeable areas post-development. Due to the size, topography and flooding extent within the Site, it would not be feasible to provide surface water attenuation to be able to restrict runoff. A free discharge rate is therefore proposed.

The FRA demonstrates that the proposed development would be operated with minimal risk from flooding and would not increase flood risk elsewhere. The development should therefore not be precluded on the grounds of flood risk, as well as surface water and foul drainage.

1.0 Introduction

1.1 Background

1.1.1 Enzygo Ltd were commissioned by Mr Doug Sanderson to carry out a site-specific Flood Risk Assessment (FRA) including a surface water drainage strategy in support of an outline planning application for a proposed single residential dwelling within infill land, located on land south of Old Mill Lane, Thurgoland, South Yorkshire (hereafter referred to as 'the Site').

1.1.2 The proposal is for a single dwelling, with associated parking and garden.

1.1.3 Planning applications for development in England require an FRA[1], when:

- In Flood Zone 2 or 3 including minor development and change of use.
- More than 1 hectare (ha) in Flood Zone 1.
- Less than 1 ha in Flood Zone 1, including a change of use in development type to a more vulnerable class (for example from commercial to residential), where they could be affected by sources of flooding other than rivers and the sea (for example surface water, drains, reservoirs).
- In an area within Flood Zone 1 which has critical drainage problems as notified by the Environment Agency.

1.1.4 Environment Agency indicative flood mapping shows that the Site is in Flood Zone 1, 2 and 3, and is at risk of surface water flooding. As such, an FRA is required.

1.1.5 The purpose of this FRA is to provide sufficient flood risk information to demonstrate that the future users of the development remain safe throughout its lifetime, that the development would not increase flood risk on Site and elsewhere and, where practicable, that the development would reduce flood risk overall.

1.2 Scope of the Assessment

1.2.1 Government policy on development and flood risk is set out in the National Planning Policy Framework (NPPF)[2] and the supporting Planning Practice Guidance: Flood Risk and Coastal Change [PPG ID: 7][3].

1.2.2 NPPF paragraphs 99-104 set out the need for an appropriate assessment of flood risk at all levels of the planning process and requires the application of a sequential risk-based approach to assess the suitability of land for development in flood risk areas.

1.2.3 The FRA should also consider the effects of climate change[4]. The climate change allowances are predictions of anticipated change for:

- Peak river flow by river basin district;
- Peak rainfall intensity;
- Sea level rise; and

[1] https://www.gov.uk/guidance/flood-risk-assessment-for-planning-applications
[2] Department for Communities and Local Government (2012) National Planning Policy Framework.
[3] Department for Communities and Local Government (2014) Planning Practice Guidance ID7-030-20140306; Flood Risk & Coastal Change.
[4] https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances

- Offshore wind speed and extreme wave height.

1.2.4 They are based on climate change projections and different scenarios of carbon dioxide emissions to the atmosphere. There are different allowances for different periods of time over the next century.

1.2.5 Site-specific FRAs provide an assessment of the flood risk to and from a development site, over its lifetime, to satisfy the requirements of the local planning authority. They are categorised as Level 1 screening studies to give a general indication of the potential flood risk to a site and identify whether more detailed Level 2 scoping assessment is required. A Level 2 assessment is a qualitative appraisal to develop understanding of flood risk to a site and the effects of the site on flooding elsewhere including recommended mitigation measures. Level 2 reporting is the minimum required to accord with the NPPF. Level 3 assessments are more detailed quantitative studies, for example modelling to establish flood levels at a site in the absence of Environment Agency data or providing detailed outline drainage designs.

1.2.6 This report is a Level 2 qualitative FRA but includes a Level 3 assessment of the surface water drainage requirements for the proposed development.

1.3 Aims

1.3.1 This FRA aims to provide sufficient flood risk information to satisfy the requirements of the NPPF, PPG ID: 7 and regional/local government plans and policies. It describes the potential for the Site to be impacted by flooding, the impacts of the proposed development on flooding elsewhere near the Site, and the proposed measures that could be incorporated into the development to mitigate the identified risks.

1.4 Planning Context

National Policy

1.4.1 The FRA was prepared in accordance with the NPPF and PPG ID: 7.

Regional/Local Policy

1.4.2 The FRA also considers the following Local Plan policies of Barnsley Metropolitan Borough Council:

- CSP 1 Climate Change
- CSP 3 Sustainable Drainage Systems (SuDS)
- CSP 4 Flood Risk

1.5 Report Structure

1.5.1 This report is structured as follows:

- Section 2 identifies the sources of information that were consulted;
- Section 3 describes the Site and the existing and proposed development;
- Section 4 outlines the flood risk to the existing site and proposed development;
- Section 5 details the proposed mitigation measures against identified flooding sources;

- Section 6 assesses the potential impacts of the proposed development on surface water drainage and proposes mitigation for those effects; and
- Section 7 presents a summary and conclusions.

2.0 Sources of Information

2.1 Sources of Information

2.1.1 The following information was used in preparation of this FRA:

- Ordnance Survey 1:25,000 mapping (Explorer 278: Sheffield and Barnsley).
- Detailed topographic survey (Appendix 1).
- Environment Agency online flood maps (Flood Map for Planning[5], Long Term Flood Risk Assessment for Locations in England[6], Operational Catchment data[7] and Environment Agency – What's in Your Backyard?[8]).
- River Basin District (RBD) Maps[9] (Humber RBD) together with guidance on climate change allowances[10]
- National River Flow Archive[11]
- Barnsley (September 2010) Strategic Flood Risk Assessment (SFRA) and associated mapping (Appendix 2).
- National Soils Resources Institute: Soilscapes online mapping[12]
- British Geological Survey [BGS] online mapping: Geology of Britain Viewer[13]
- Landmark's Promap: Flood Data package: Additional flood mapping
- Geosmart 1 in 100-year groundwater flood risk map
- Yorkshire Water sewer asset plans (Appendix 3).
- DEFRA's Magic Map[14] for identifying Designated Sites.
- BHS Chronology of British Hydrological Events.

2.2 Consultation and Discussion with Regulators

2.2.1 Consultation and discussions were undertaken with the Environment Agency, the Local Planning Authority (LPA)/Lead Local Flood Authority (LLFA), and Water Utility.

Environment Agency

2.2.2 The Environment Agency is a statutory consultee on flood risk and planning and is directly responsible for the prevention, mitigation and remediation of flood damage for main rivers and coastal areas; and it has a strategic overview for all forms of flooding.

[5] https://flood-map-for-planning.service.gov.uk/
[6] https://flood-warning-information.service.gov.uk/long-term-flood-risk/
[7] http://environment.data.gov.uk/catchment-planning/OperationalCatchment/3459
[8] http://maps.environment-agency.gov.uk/wiyby/wiybyController?ep=maptopics&lang=_e
[9] https://www.gov.uk/government/publications/flood-risk-assessments-river-basin-district-maps
[10] https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances
[11] http://nrfa.ceh.ac.uk
[12] http://www.landis.org.uk/soilscapes/
[13] http://mapapps.bgs.ac.uk/geologyofbritain/home.html
[14] http://www.natureonthemap.naturalengland.org.uk/

2.2.3 Environment Agency Standing Advice[15] and the NPPF/PPG ID: 7 was consulted and reviewed.

2.2.4 Correspondence with the Environment Agency is included in Appendix 4.

Barnsley Metropolitan Borough Council

2.2.5 Barnsley Metropolitan Borough Council as the LLFA is responsible for surface water, groundwater and ordinary watercourses and was consulted on flood risk issues at this Site. The consultation response is included in Appendix 5.

Yorkshire Water

2.2.6 All Water Companies have a statutory obligation to maintain the DG5 Flood Register of properties which are at risk of flooding from the public sewerage system.

2.2.7 Yorkshire Water is responsible for the disposal of wastewater within the area.

[15] https://www.gov.uk/guidance/flood-risk-assessment-standing-advice

3.0 Site Location and Description

3.1 Location

3.1.1 The Site is located on land south of Old Mill Lane, Thurgoland, South Yorkshire, S35 7AG and is centred on National Grid Reference (NGR) 429062, 400007.

3.1.2 The Site location is shown in Drawing 001 and in more detail in Drawing 002 with the study area enclosing an area of 0.09ha.

3.2 Land Use

3.2.1 The land is currently used as an allotment, including sheds (Figure 3.1).

Figure 3.1: Site Photographs



***Top Left**: View looking south across the Site. **Top Right**: View looking north across the Site. **Bottom Left**: View looking towards the south-west corner of the Site. **Bottom Right**: View looking towards the south-east corner of the Site.*

3.2.2 The Site is bounded by Old Mill Lane to the north, with residential dwellings beyond; residential dwelling to the east and west; and the River Don to the south.

3.2.3 The Site is currently accessed from Old Mill Lane to the north.

3.3 Topography

3.3.1 The topographic survey shows that the Site falls in a southerly direction from 159.4m AOD (located at the Site entrance, along the northern boundary) to approximately 156.0m AOD within the southern extent (top of stone wall/retaining wall) where the Site is terraced. The fall of 3.5m over 22m gives a gradient of 1:7.

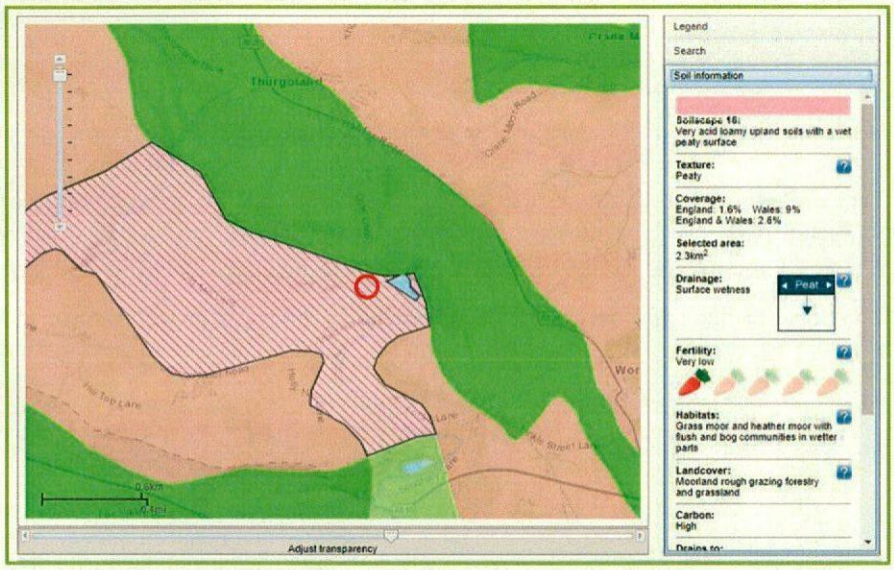
3.3.2 The retaining wall is approximately 0.5m in height along the eastern boundary, increasing to approximately 1.0m towards the western boundary. Land to the south of the retaining wall is

less steep, falling from 155.4m AOD (located at the base of the retaining wall) to approximately 154.1m AOD (located along the southern boundary, adjacent to the River Don). The fall of 1.3m over 11.5m gives a gradient of 1:17.

3.4 Soils and Geology

3.4.1 The Soilscapes online soils map viewer (Figure 3.2) shows that the Site is underlain by upland soils with a wet peaty surface. The soils are indicative of low infiltration potential.

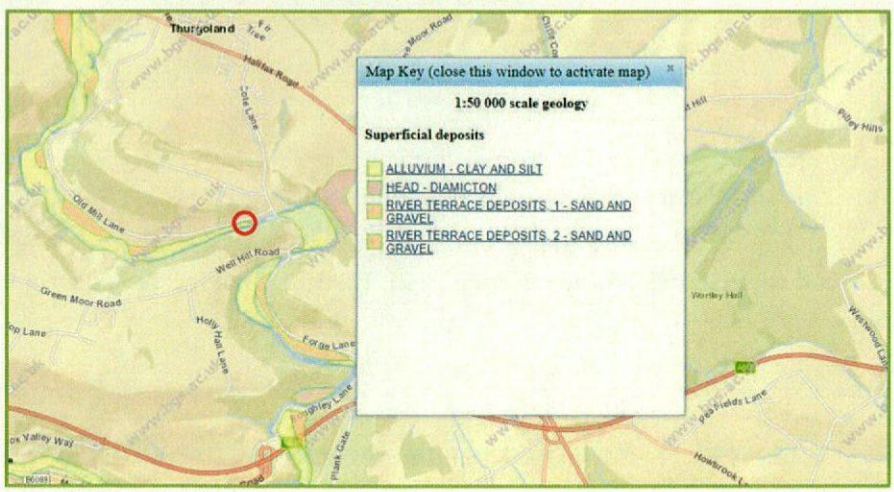
Figure 3.2: Soils Mapping



Soils Data © Cranfield University (NSRI) and for the Controller of HMSO [2018].

3.4.2 The Geology of Britain online map viewer (Figure 3.3) shows the southern extent of the Site is underlain by Alluvium (clay and silt). The bedrock is Pennine Lower Coal Measures Formation (mudstone, siltstone and sandstone). The superficial deposits and bedrock is indicative of low infiltration potential.

Figure 3.3: Geology Mapping (continues over page)



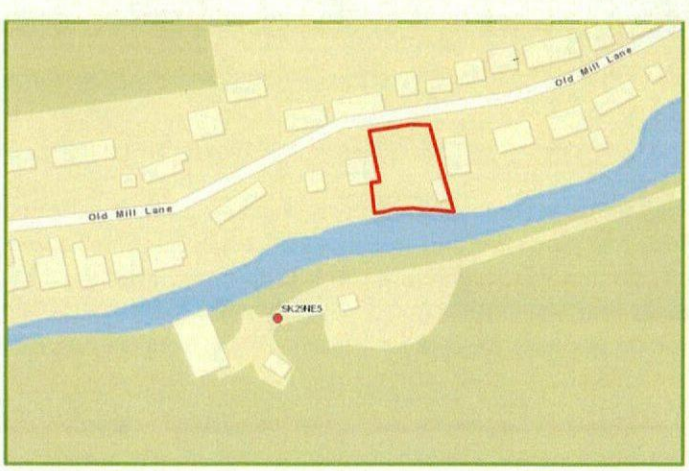


***Left**: Superficial deposits. **Right**: Bedrock. Contains British Geological Survey materials © NERC [2018]*

3.4.3 The Geology of Britain online map viewer shows the nearest borehole in relation to the Site is SK29NE5 (Greenmoor Quarries), located approximately 70m to the south-west of the Site, which is shown to be located within an area with the same soils and bedrock (Figure 3.4).

3.4.4 The borehole log has a depth of 61.57m, which found clays, gravel, shale and sandstone within the first 13.72m. A copy of the borehole log is included in Appendix 6.

Figure 3.4: BGS Online Mapping Extract – Borehole Records



Contains British Geological Survey materials © NERC [2018]

3.5 Hydrogeology

3.5.1 The borehole log did not indicate that groundwater was struck.

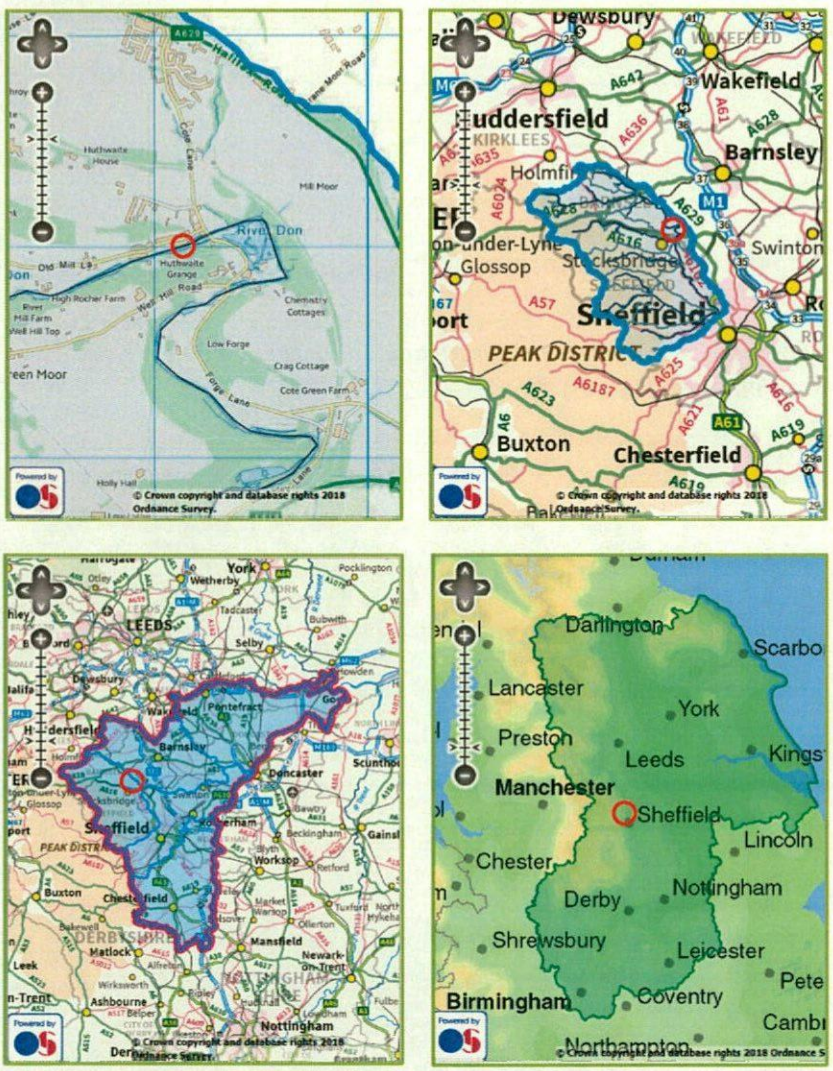
3.5.2 The Environment Agency online groundwater mapping shows the Site is not located in a Groundwater Source Protection Zone (SPZ). The Site is not located above a Principal Aquifer.

3.6 Catchment Hydrology

i. Environment Agency Catchment Data Explorer Mapping

3.6.1 The Environment Agency Catchment Data Explorer (Figure 3.5) shows the Site lies in the catchment of the River Don (Don from Scout Dyke to the Little Don), within the Don and Rother management catchment and the Don Upper operational catchment, within the Humber River Basin District.

Figure 3.5: Catchment Data Explorer Mapping

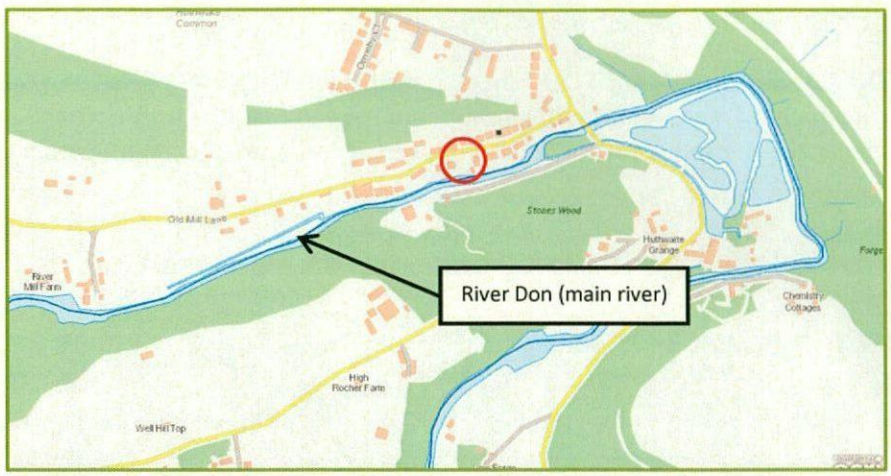


Top Left: *River Don (source to confluence with the River Axe Estuary), zoomed to Site level.* ***Top Right:*** *River Don (Don from Scout Dyke to the Little Don), full catchment.* ***Bottom Left:*** *Don and Rother Operational Catchment.* ***Bottom Right:*** *Humber River Basin District. Contains Environment Agency information © Environment Agency and database right.*

ii. Environment Agency's online Main River Consultation Mapping

3.6.2 The River Don conveys flows in an easterly direction, along the southern boundary of the Site (Figure 3.6).

Figure 3.6: Main River Consultation Map



Contains Environment Agency information © Environment Agency and database right.

iii. Site Walkover Observations

3.6.3 A Site walkover was undertaken during March 2018. The River Don adjacent to the Site was observed to be carrying a moderate amount of flow (albeit the surface was frozen) and was well maintained (Figure 3.7).

Figure 3.7: River Don Photographs

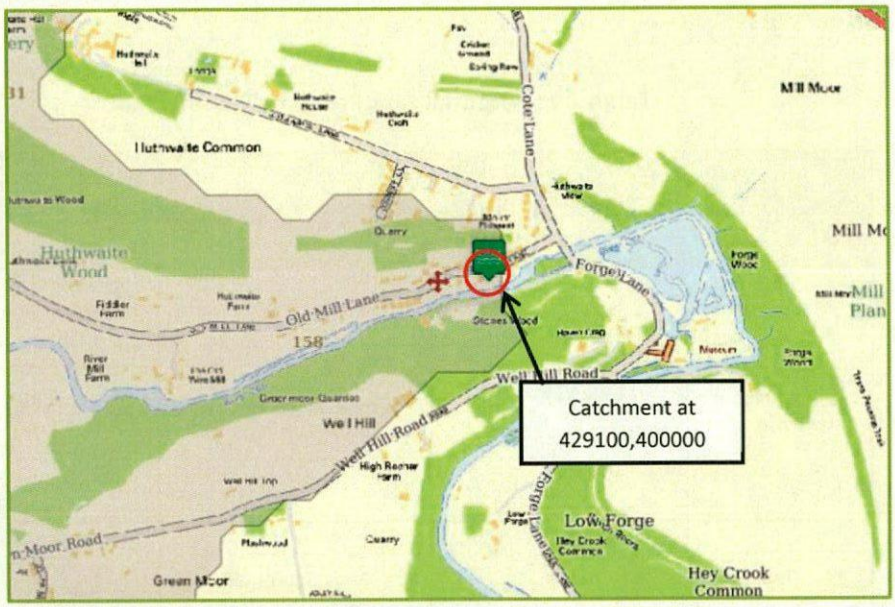


***Top**: View looking downstream (east). **Bottom**: View looking upstream (west).*

iv. FEH Web Service Mapping

3.6.4 A review of the FEH Web Service mapping (Figure 3.8) shows the Site falls within the catchment of the River Don.

Figure 3.8: FEH Web Service Extract



Contains Centre for Ecology & Hydrology information © Ecology & Hydrology and database right [2018]

3.7 Sewerage Assets

3.7.1 Yorkshire Water asset plans show a Ø225mm surface water sewer conveying flows east within Old Lane to the north of the Site. The surface water sewer begins adjacent to Stone Croft (to the east of the Site) and terminates adjacent to Thurlea. It is assumed the surface water sewer outfalls to the River Don, downstream from the Site.

3.7.2 There is a Ø150mm foul sewer conveying flows east and a rising main pumping flow west within Old Lane to the north of the Site.

3.8 Designated Sites

3.8.1 The DEFRA Magic Map (England and Wales)[16] shows the nearest designated sites are Wharncliffe Heath (Local Nature Reserve – LNR) and Wharncliffe Crags (Site of Special Scientific Interest – SSSI) is located approximately 1.80km to the south-east of the Site. Furthermore, Town End Common is located approximately 1.95km to the south-east of the Site.

3.8.2 The River Don does not pass through or along any of the identified sites. Furthermore, the River Don passes through built development associate with Penistone, Thurgoland, Deepcar and Wharncliffe Side (etc) upstream from the identified designated sites. As such, a single residential dwelling is unlikely to impact upon water quality.

[16] http://www.natureonthemap.naturalengland.org.uk/MagicMap.aspx

4.0 Flood Risk Assessment

4.1 Potential Sources of Flooding

4.1.1 A summary of the potential sources of flooding and the potential risk posed by each source at the Site is presented in Table 4.1. Each source of flooding and level of risk is then assessed in further detail.

Table 4.1: Potential Risk Posed by Flooding Sources

Flooding Source	Potential Flood Risk at Application Site (Yes/No)	Potential Source	Data Sources
Fluvial	Yes	River Don	Surface Water Features (Drawing 002), Environment Agency flood mapping (Drawing 005), Environment Agency historic flood mapping (Drawing 008), JBA Flooding (Drawing 00.4.2) OS mapping, SFRA mapping and Environment Agency/LLFA Consultation.
Tidal	No	None identified	Surface Water Features (Drawing 002), Environment Agency flood mapping (Drawing 005) and OS mapping.
Groundwater	No	Aquifer	BGS mapping (Drawing 003) and Geosmart Groundwater mapping (Drawing 006).
Surface Water	Yes	Poor permeability	Environment Agency online flood mapping, SFRA mapping, Environment Agency/LLFA correspondence, JBA Surface Water Flooding (Drawing 004.1) and Environment Agency Complex mapping (Drawing 009.1-009.4).
Sewer	Yes	Public sewers	Asset plans and topographic survey.
Infrastructure Failure	Yes	Reservoir failure	Environment Agency online flood mapping, Drawing 004.2 (Dam Break Flood Extent) and SFRA mapping

4.2 Fluvial Flooding

Environment Agency Flood Map

4.2.1 The Environment Agency Flood Zones are the current best information on the extent of the extremes of flooding from rivers or the sea that would occur without the presence of flood defences, since these can be breached, overtopped and may not be in existence for the lifetime of a development.

4.2.2 The Environment Agency online flood map (Drawing 005) shows the northern extent of the Site (including Site access/egress) is located within Flood Zone 1; which is land outside the extent of the 1 in 1000-year (<0.1% Annual Exceedance Probability [AEP]) risk of fluvial (river) flooding, at 'low' risk. The southern extent of the Site is within Flood Zone 2, which is land located between the extents of the 1 in 100-year and 1 in 1000-year (<1% to >0.1% AEP) event, at 'medium' risk; and Flood Zone 3, which is land located within the extent of the 1 in 100-year (1% AEP) event, at 'high' risk.

4.2.3 The flood mapping does not differentiate Flood Zones 3a from 3b, which is 'functional floodplain' (1 in 20-year/5% AEP).

Modelled Flood Levels

4.2.4 The Environment Agency provided modelled flood levels for the River Don, sourced from the Sheffield Comprehensive Flood Review (CFR) Model – RFI 74440 (2012). A range of return period were provided, including the 1 in 25-year, 100-year and 1000-year event, for both defended and undefended scenarios.

4.2.5 A summary of the modelled flood levels is included below in Table 4.2 and Table 4.3, and a node location plan is included in Figure 4.1. The most relevant node to the Site is considered to be upstream node (DON_17_19555), and downstream node (DON_17_19354d). The Site is located between the two nodes, therefore interpolated flood levels can be assumed by taking an average of upstream and downstream flood levels. There is no difference in flood levels under a defended and undefended scenario.

Table 4.2: Modelled Flood Levels (Defended Scenario)

Node	Location	Flood Level (m AOD) / Return Period		
		25yr (4% AEP)	100yr (1% AEP)	1000yr (0.1% AEP)
DON_17_19555	Upstream from Site.	155.687	155.954	156.793
Interpolate	*Adjacent to Site*	*155.291*	*155.519*	*156.514*
DON_17_19354u	Downstream from Site.	154.894	155.083	156.235

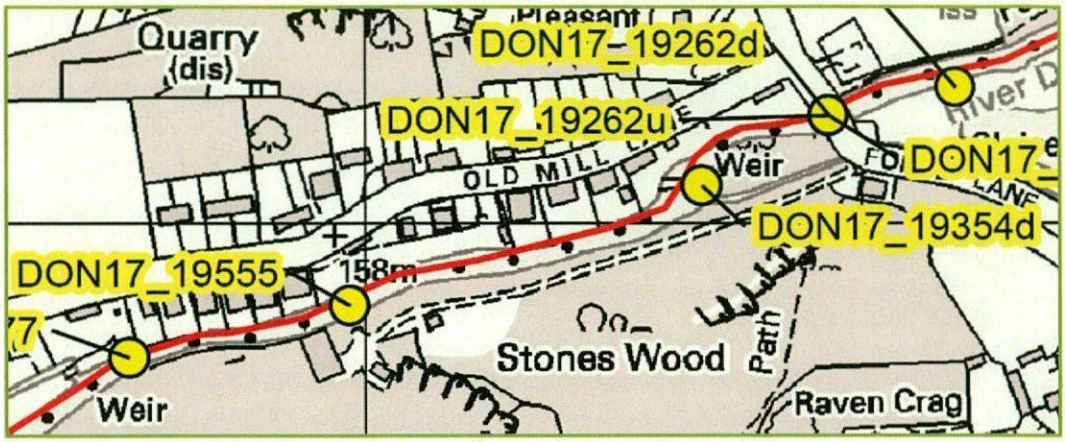
Contains Environment Agency information © Environment Agency and database right.

Table 4.3: Modelled Flood Levels (Undefended Scenario)

Node	Location	Flood Level (m AOD) / Return Period		
		25yr (4% AEP)	100yr (1% AEP)	1000yr (0.1% AEP)
DON_17_19555	Upstream from Site.	155.687	155.954	156.793
Interpolate	*Adjacent to Site*	*155.291*	*155.519*	*156.514*
DON_17_19354u	Downstream from Site.	154.894	155.083	156.234

Contains Environment Agency information © Environment Agency and database right.

Figure 4.1: Node Location Plan



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4.2.6 The modelled flood levels from the upstream node (DON_17_19555) were overlaid onto the detailed topographic survey in order to accurately map the flood outlines within the Site boundary. A copy of the modelled flood outline has been included within Drawing 10. Drawing 10 shows the southern extent (up to the retaining wall) is located within the mapped extent of the 1 in 25-year and 1 in 100-year event (i.e. Flood Zone 3a and 3b). The middle of the Site is located within the mapped extent of the 1 in 1000-year event (Flood Zone 2). The northern extent of the Site is located outside the mapped extent of the 1 in 1000-year event (i.e. Flood Zone 1).

4.2.7 Whilst the 1 in 20-year event is representative of Flood Zone 3b, the 1 in 25-year modelled flood level is considered close enough to establish the flood outline.

4.2.8 The Environment Agency reported that Lower Don Valley FAS Post Scheme Modelling is expected to be available in April 2018 and that the defended levels have not been verified and may change following an update. However, the information provided was the best information available at the time of preparing this report. Furthermore, the reach adjacent to the Site is demonstrated not to be influenced by flood defences (see Tables 4.1 and 4.2)

Climate Change

4.2.9 We acknowledge +20% climate change was the national standard prior to February 2016, after which climate change for the Humber RBD is now 30% for the 'higher central' allowance and 50% for the 'upper end' allowance (anticipated for the '2080's' [2070 to 2115]).

4.2.10 The Environment Agency consultation did not include the 1 in 100-year (plus 20% climate change) modelled flood levels. Based on the limit scale of development associated with a single dwelling within infill land, it is considered appropriate to utilise the conservative 1 in 1000-year modelled flood when considered flood risk mitigation measures.

JBA Flooding from Rivers

4.2.11 The JBA Flooding from Rivers map (Drawing 004.2) is in agreement with the Environment Agency online flood map, showing the Site is located within Flood Zones 1, 2 and 3. Furthermore, the JBA mapping shows an area of Flood Zone 3b within the southern extent of the Site. However, the mapping is coarse in relation to the Environment Agency flood mapping

(Drawing 005) and comparison of modelled flood levels to the detailed topographic survey (Drawing 010). As such, the JBA mapping should be superseded.

SFRA Mapping

4.2.12 The SFRA mapping is in agreement with the Environment Agency online flood map, showing the Site is located within Flood Zones 1, 2 and 3. However, the mapping is coarse in relation to the Environment Agency flood mapping (Drawing 005) and comparison of modelled flood levels to the detailed topographic survey (Drawing 010).

Flood History

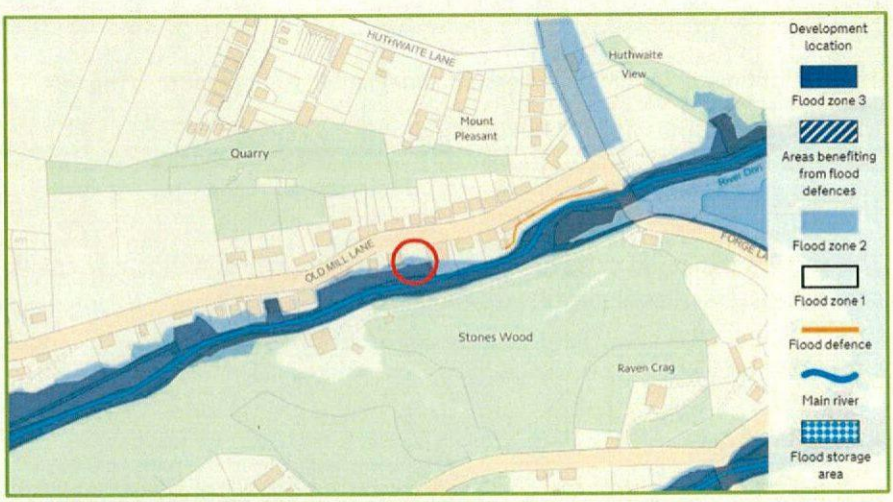
4.2.13 The Environment Agency consultation reported that there is no known flood history reported at this Site. However, the Site is in close proximity to the location of historical flooding. The extent of flooding, and/or flood level information is only shown for those watercourses surveyed after the flood event. Other flooding may have occurred which is not shown. This is the best information currently available.

4.2.14 However, the historical flood mapping provided by the Environment Agency shows the southern extent of the Site is located within the mapped extent of historical flooding, during the 2007 event (River Don Huthwaite).

Flood Defences

4.2.15 Environment Agency online flood mapping (Figure 4.2) shows the Site does not benefit from flood defences. Flood defences are located along the left (northern) bank of the River Don along the downstream (eastern) reach, just upstream (west) from the Forge Lane culvert crossing.

Figure 4.2: Flood Warning Areas



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4.2.16 The Environment Agency consultation included defence mapping, including Agency and non-Agency maintained assets.

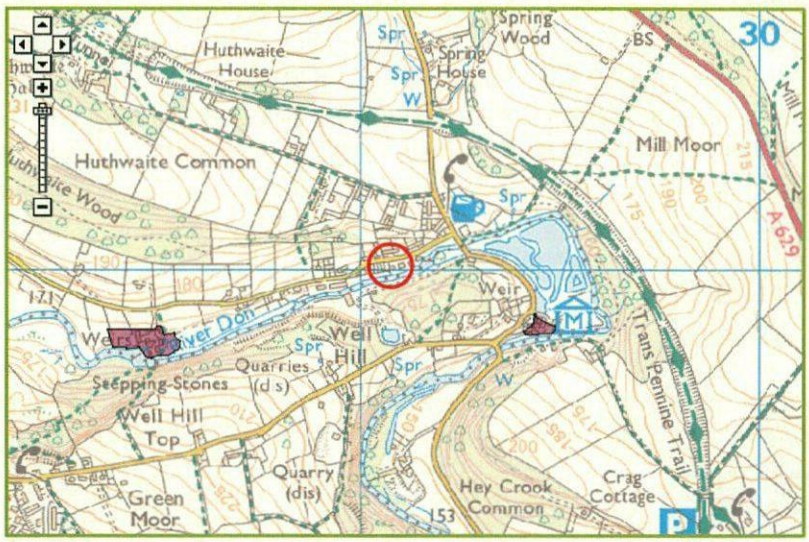
4.2.17 Asset 135320 along the left (northern) bank along the Sites southern boundary, and asset 170502 along the right (southern bank) adjacent to the Site are non-Agency assets. The flood defence identified in Figure 5.2 is reported to be asset 25777, which is an Agency maintained

asset. Asset details (including defence descriptions, crest heights and condition ratings) were not included.

Flood Warning

4.2.18 Environment Agency online flood mapping shows the Site is not located within an area which receives flood warnings. However, there are area to the south-east (downstream) and south-west (upstream) which receive flood warnings (Figure 4.3).

Figure 4.3: Flood Warning Areas



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Summary Flood Risk

4.2.19 The risk of fluvial flooding is assessed as negligible to high, across the Site.

4.2.20 Mitigation measures against fluvial flooding are discussed in Section 5.

4.3 Tidal Flooding

4.3.1 The Site is not located close to tidally affected flooding sources and so the flood risk from this source is assessed as negligible.

4.4 Groundwater Flooding

Introduction

4.4.1 Groundwater flooding occurs when subsurface water emerges either at surface or in made ground or in subsurface structures such as basements and services ducts. It occurs as diffuse seepage, emergence from new point source springs or an increase in flow from existing springs. It results from aquifer recharge from infiltrating rainfall, from sinking streams entering aquifers from adjacent non-aquifers, or from high river levels or tides driving water through near surface deposits. It tends to occur with a delay following rainfall and can last for several weeks or months. Groundwater flooding or shallow water tables also prevent or reduce infiltration and so can worsen surface water flooding.

The BGS Groundwater Flooding Susceptibility Map

4.4.2 The BGS Groundwater Flooding Susceptibility Map (Drawing 003) shows the Site is within the mapped extent of susceptibility to groundwater flooding of property situated below ground level.

4.4.3 The clayey geology is indicative of low infiltration potential; therefore, it is unlikely that groundwater would rise to the surface.

Geosmart 1 in 100-year Groundwater Flood Risk Map

4.4.4 The Geosmart 1 in 100-year groundwater flood risk map (Drawing 006) shows that the Site is at negligible risk of groundwater flooding. This data source is of a higher resolution and accuracy level than the BGS mapping and is therefore taken in preference.

4.4.5 Mapped classes combine understanding of likelihood, model and data uncertainty, and possible severity. Likelihood is ranked according to whether we expect groundwater flooding at a site due to extreme elevated groundwater levels with an annual probability of occurrence greater than 1%, considering model and data uncertainty. Severity relates to expectations of the amount of property damage or other harm that groundwater flooding at that location might cause (Table 4.4).

Table 4.4: Groundwater Flood Risk Classification

Risk Class	Probability of Groundwater Flooding	Effect
4: Negligible	Annual probability less than 1%.	Negligible unless unusually sensitive use.
3: Low	Annual probability greater than 1%.	Remote possibility of damage to property or harm to sensitive receptors Flooding likely to be limited to seepages and waterlogged ground, damage to basements and subsurface infrastructure, and should pose no significant risk to life. Surface water flooding may be worsened.
2: Moderate	Annual probability greater than 1%.	Significant possibility of damage to property or harm to other sensitive receptors at or near this location. flooding is likely to be in the form of shallow pools or streams. Surface water flooding and failure of drainage systems may be worsened when groundwater levels are high.
1: High	Annual probability greater than 1%.	Groundwater flooding will occur which could lead to damage to property or harm to other sensitive receptors at or near this location. Flooding may result in damage to property, road or rail closures and, in exceptional cases, may pose a risk to life. Surface water flooding and failure of drainage systems may be worsened when groundwater levels are high.

Summary Flood Risk

4.4.6 The risk of groundwater flooding is assessed as negligible.

4.5 Surface Water Flooding

Introduction

4.5.1 Surface water flooding occurs following rainfall on ground where infiltration rates are less than the rainfall precipitation rate. This can occur when either:

- Soils or ground materials are naturally of low permeability or have been compacted (infiltration excess runoff);
- Soils or ground materials are saturated from previous rainfall either directly or from upslope (saturation excess runoff and return flow) or from high groundwater levels.

JBA Surface Water Flood Map

4.5.2 The JBA Surface Water Flood Map (Drawing 004.1) shows the southern extent is located within the mapped extent of surface water flooding, associated with the 1 in 75-year, 200-year and 1000-year events. The surface water flood outline is reflective of the fluvial flood outline.

Environment Agency Complex Surface Water Flood Mapping

4.5.3 The Environment Agency Complex Surface Water Flood Mapping (Drawings 009.1 to 009.4) shows the southern extent is located within the mapped extent of surface water flooding, associated with the 1 in 30-year, 100-year and 1000-year events. The surface water flood outline is reflective of the fluvial flood outline.

4.5.4 The flood depth is between 0.15m to 1.20m during the extreme 1000-year event. The flood velocity is between 0.25m/s and 1.00m/s. The flood hazard is 'low' (0.50-0.75) to 'extreme' (>2.0).

4.5.5 The Site access/egress to the north of the Site is located outside the mapped extent of surface water flooding.

Summary Flood Risk

4.5.6 The risk of surface water flooding is assessed as negligible to high, across the Site.

4.5.7 Mitigation measures against surface water flooding are discussed in Section 5.

4.6 Sewer Flooding

4.6.1 Sewer flooding occurs when urban drainage networks become overwhelmed after heavy or prolonged rainfall due to restrictions or blockage in the sewer network or if the volume of water draining into the system exceeds the sewer design capacity.

4.6.2 New sewers are built to the guidelines within Sewers for Adoption[17] and have a design standard to the 1 in 30-year flood event. Older sewers were not designed to any standard. Modern sewer systems will only surcharge during rainstorm events with a return period greater than 30-years (e.g. 100-years).

[17] WRC (2012) Sewers for Adoption 7th Edition.

4.6.3 There are no sewers located within the Site boundary. The nearest assets are located within Old Mill Lane to the north.

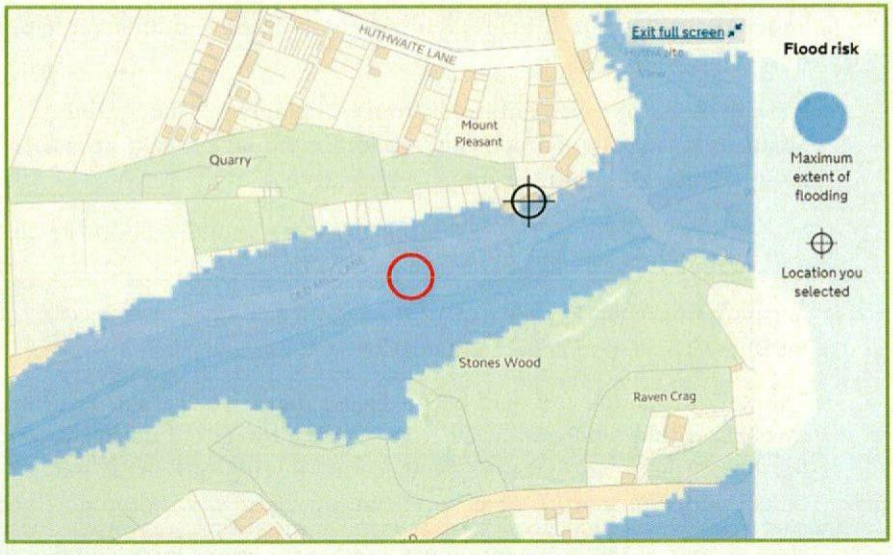
4.6.4 The risk of flooding from sewers at the Site is assessed as negligible.

4.7 Flooding from Infrastructure Failure

Reservoir Failure

4.7.1 The Environment Agency online flood mapping and JBA shows the Site is located within the extent of flooding sourced from reservoirs (Figure 4.4).

Figure 4.4: Flood Risk from Reservoirs



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4.7.2 Reservoir flooding is extremely unlikely to happen. There has been no loss of life in the UK from reservoir flooding since 1925. All large reservoirs must be inspected and supervised by reservoir panel engineers. As the enforcement authority for the Reservoirs Act 1975 in England, the Environment Agency ensure that reservoirs are inspected regularly, and essential safety work is carried out.

4.7.3 The risk of flooding from reservoirs is assessed as negligible.

5.0 Flood Risk Mitigation Measures

5.1 Introduction

5.1.1 The following sources of flooding were identified:

- Fluvial flooding; and
- Surface water flooding.

5.2 Mitigation Measures

Fluvial Flooding

- Sequentially develop the Site, limiting the built development to Flood Zones 1 and 2 (low to medium risk).
- Provide an 8m easement free from development along the southern boundary, adjacent to the River Don. This easement would provide access for inspection and maintenance purposes, including vehicle access.
- Set finished floor levels above the 1 in 1000-year modelled flood levels (156.514m AOD) and +150mm threshold above external levels
- Access/egress will be provided to the front of the property to Old Mill Lane, which is located within Flood Zone 1 (low risk).
- The loss of floodplain would be negligible based on the scale of development (single dwelling within infill land). Due to the size of the Site, floodplain compensation is not feasible. The lower ground floor could be utilised as a garage (similar to the neighbouring property), which would accept flood water during a flood event.
- New owners of the property should register the property to Floodline: Floodline - 0345 988 1188 (24-hour service).

Surface Water Flooding

- Adoption of a surface water management strategy (See Section 6).
- Set finished floor levels as per above.
- Provide access/egress as per above.

5.3 Summary of Flood Risk

5.3.1 Table 5.1 summarises the probability and level of risk, both with and without mitigation measures.

Table 5.1: Probability and Consequences of All Sources of Flooding

Flooding Source	Potential Source	Probability	Consequence & Impact Without Mitigation	Consequence & Impact with Mitigation
Fluvial	River Don	Negligible to High, across the Site	Negligible to High, across the Site	Low
Tidal	None identified	Negligible	Negligible	Negligible
Groundwater	Aquifer	Negligible	Negligible	Negligible
Surface Water	Poor Permeability	Negligible to High, across the Site	Negligible to High, across the Site	Low
Sewer	Public sewers	Negligible	Negligible	Negligible
Infrastructure Failure	Reservoir failure	Negligible	Negligible	Negligible

Key: *Green - Negligible, Yellow - Low, Orange - Medium and Red - High; based on consequence and impact with mitigation from each flooding source.*

5.4 Flood Guidance and Sequential Test

5.4.1 The proposal is for a single residential dwelling within infill land. Table 2 of PPG ID: 7 (not included in this report) classifies the proposed use as 'more vulnerable'.

5.4.2 The Environment Agency Flood Zones and acceptable development types are listed in Table 5.2. All development types (including more vulnerable uses) are acceptable in Flood Zones 1 and 2 (low to medium risk).

5.4.3 Subject to mitigation measures, the Sequential Test would be passed, and the Exception Test would not be required as indicated in Table 5.3.

Table 5.2: Environment Agency Flood Zones and Appropriate Land Use

Flood Zone	Probability	Explanation	Appropriate Land use
Zone 1	Low	Less than 1 in 1000 annual probability of river or sea flooding in any year (<0.1%).	All development types generally acceptable.
Zone 2	Medium	Between a 1 in 100 and 1 in 1000 annual probability of river flooding (1% - 0.1%) or between a 1 in 200 and 1 in 1000 annual probability of sea flooding (0.5% - 0.1%) in any year.	Most development type are generally acceptable.
Zone 3a	High	A 1 in 100 or greater annual probability of river flooding (>1%) or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year.	Some development types not acceptable.
Zone 3b	'Functional Floodplain'	Land where water must flow or be stored in times of flood. SFRAs should identify this zone (land which would flood with an annual probability of 1 in 20 (5%) or greater in any year or is designed to flood in an extreme (0.1% flood, or at another probability to be agreed between the LPA and the Environment Agency, including water conveyance routes).	Some development types not acceptable.

Note: *The Flood Zones are the current best information on the extent of the extreme flood from rivers or the sea that would occur without the presence of flood defences, because these can be breached, overtopped and may not be in existence for the lifetime of the development. The identified risk of fluvial flooding is highlighted green.*

Table 5.3: Vulnerability and Flood Zone 'Compatibility' as identified in Table 3 of PPG ID: 7

Flood Risk Vulnerability classification (see Table 1 of PPG ID: 7)	Essential Infrastructure	Water Compatible	Highly Vulnerable	More Vulnerable	Less Vulnerable
Zone 1	Yes	Yes	Yes	Yes	Yes
Zone 2	Yes	Yes	Exception test required	Yes	Yes
Zone 3a	Exception test required	Yes	No	Exception test required	Yes
Zone 3b 'Functional Floodplain'	Exception test required	Yes	No	No	No

Key: *Yes: Development is appropriate, No: Development should not be permitted.*
The identified risk of fluvial flooding is highlighted green.

6.0 Site Drainage

6.1 Surface Water Drainage

6.1.1 Consideration of flood issues is not confined to the floodplain. This is recognised in the NPPF and associated guidance where all proposed development of 1ha or more in Flood Zone 1 and so outside the floodplain nevertheless requires an FRA. The alteration of natural surface water flow patterns through developments can lead to problems elsewhere in a catchment, particularly flooding downstream; and replacing permeable vegetated areas with low permeability roofs, roads and other paved areas will increase the speed, volume and peak flow of surface water runoff.

6.1.2 A surface water management strategy for the development is proposed to manage and reduce the flood risk posed by surface water runoff from the Site. The developer will be required to ensure that any scheme for surface water should build in sufficient capacity for the entire Site.

6.1.3 The surface water drainage arrangements for any development Site should be such that the volume and peak flow rates of surface water leaving a developed Site are no greater than the rates prior to the proposed development, unless specific off-Site arrangements are made and result in the same net effect.

6.1.4 An assessment of the surface water runoff rates was undertaken to determine the surface water options and attenuation requirements for the Site.

6.2 Existing Drainage System

6.2.1 The Site is 0.09ha in area and is currently used as an allotment.

6.2.2 The Site is underlain by wet peaty soils and clayey superficial deposits/bedrock with indicative low infiltration potential. It is likely that drainage is predominantly via overland flow, following the topography of the Site to the topographic low points (i.e. River Don), with a small amount of infiltration to bedrock, and throughflow to the River Don.

6.3 Proposed Development

6.3.1 The proposal is for a single residential dwelling within infill land. At this stage, a layout is unavailable as it is proposed the land will be sold with outline planning permission.

6.3.2 A developable area of 520m^2 (0.0520ha) is located above the retaining wall, within Flood Zone 1 and 2. Of this, an assumed 55% (285m^2/0.0285ha) will be impermeable/hardstanding area (building footprint, driveway, etc). This is considered a conservative estimate, based upon similar developable areas within neighbouring plots.

6.3.3 The proposed development will increase the impermeable surfaces and therefore increase the amount of runoff.

Table 6.1: Impermeable Area

Area	Existing Buildings and Hardstanding	Proposed Buildings and Hardstanding	Difference
Area (ha)	0.0000	0.0285	+0.0285
Percentage of Total Site Area (%)	0.0	31.6	+31.6

6.4 Runoff Rates

6.4.1 An assessment of runoff rates was undertaken to determine the attenuation requirements for the proposed development.

6.4.2 The pre-development greenfield runoff rates were calculated using the FSR rainfall method within PDS Flow software, which is an appropriate methodology for Sites up to 50 hectares in area. Extracts from the PDS Flow calculations are included in Appendix 7.

6.4.3 The post-development has been calculated by the average rainfall rate (1 in 1, 30 and 100 events) for 30-minutes. Extracts from the Microdrainage calculations are included in Appendix 8.

6.4.4 Table 6.2 shows the calculated runoff rates for both pre- and post-development scenarios.

Table 6.2: Pre- and Post-Development Runoff Rates

Annual Probability (Return Period, years)	Pre-Development Runoff (l/s)	Post Development Runoff (l/s)
100% (1)	0.1	1.5
3.33% (30)	0.1	3.7
1% (100)	0.2	4.9
1% + Climate Change	0.3	6.9

Note: *40% added to the data to account for long-term climate change as stated in 'Flood Risk Assessment: Climate Change Allowance'. The 1-year, 30-year and 100-year annual probability events are of importance to the Water Companies and the Environment Agency when looking at sewage discharge and flood risk.*

6.4.5 5 l/s is normally the recommended minimum rate as per the current best practice guidance contained within 'Preliminary rainfall runoff management for developments, R&D Technical Report W5-074/A/TR/1, Revision E'.

6.4.6 The runoff rate post-development has been calculated to be 6.9l/s for the 1 in 100-year event (plus 40% climate change event), which exceeds the 5l/s minimum rate by 1.9l/s.

6.4.7 Due to the size, topography and flooding extent within the Site, it would not be feasible to provide surface water attenuation to be able to restrict runoff to the 5l/s minimum rate. A free discharge rate is therefore proposed.

6.4.8 The modelled flows are included in Table 6.3. An interpolated flow has been estimated by taking an average of flows between the upstream and downstream nodes.

6.4.9 The proposed 6.9 l/s discharge rate, minus the current 0.3 l/s runoff rate is 6.6 l/s (or 0.0066 m^3/s), which is the addition flow discharged to the River Don compared to existing conditions.

6.4.10 0.0066 m^3/s accounts for 0.014% of the 1 in 25-year event, 0.010% of the 1 in 100-year event and 0.006% of the 1 in 1000-year event. The increase in flow from the single dwelling (within infill land) would not measurably increase fluvial flood risk based on the negligible increase in runoff.

Table 6.3: Modelled Flows (Defended Scenario)

Node	Location	Flow (m^3/s) / Return Period		
		25yr (4% AEP)	100yr (1% AEP)	1000yr (0.1% AEP)
DON_17_19555	Upstream from Site.	47.913	65.021	119.031
Interpolate	*Adjacent to Site*	*47.912*	*65.023*	*119.032*
DON_17_19354u	Downstream from Site.	47.911	65.025	119.033

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6.5 Sustainable Drainage Options (SuDS)

SuDS Consideration

6.5.1 Sustainable water management measures should be used to control the surface water runoff from the proposed development Site, thereby managing the flood risk to the Site and surrounding areas from surface water runoff. These measures will also improve the quality of water discharged from the Site.

6.5.2 The Site is underlain by wet peaty soils and clayey superficial deposits/bedrock with indicative low infiltration potential. As such, the use of infiltration-based SuDS is unlikely to be feasible.

6.5.3 Since a free discharge to watercourse is proposed, attenuation should not be required, including no infiltration-based SuDS.

6.5.4 A turfed swale will be used to convey flows between the outfall (located at the retaining wall) and the River Don (Drawing 011).

6.6 Surface Water Management Strategy

Hierarchy of Discharge

6.6.1 In accordance with requirement H3 of the Building Regulations 2010[18] rainwater runoff must discharge to one of the following, listed in order of priority:

1. **An adequate soakaway or some other adequate infiltration system; or, where that is not reasonably practicable:** Infiltration based SuDS is unlikely to be feasible due to the low infiltration potential of the wet peaty soils and clayey superficial deposits/bedrock.
2. **A watercourse; or where that is not reasonably practicable:** The River Don conveys flows in an easterly direction, along the southern boundary of the Site.
3. **A sewer:** There is a surface water and foul sewer located within Old Mill Lane to the north of the Site. An outfall to the surface water sewer would require a pumped connection (due to the depth of sewer to achieve a gravity fed connection) and a restricted rate to foul would be a last option after exhausting the drainage hierarchy and would require Yorkshire Water agreement.

6.6.2 The potential route to discharge from the existing Site will be by outfall to watercourse.

6.6.3 Where a new surface water outfall is proposed, pre-approval would need to be sought from the Environment Agency.

[18] Office of the Deputy Prime Minister, The Building Regulations 2010.

6.6.4 The proposed development may require a permit under the Environmental Permitting (England and Wales) Regulations 2010 for any proposed works or structures, in, under, over or within eight metres of the top of the bank of the River Don, A permit is separate to and in addition to any planning permission granted. Works should not commence until the permit is granted.

Drainage Design and Flood Risk Considerations

6.6.5 Surface water runoff would be directed to the drainage system through drainage gullies located around the perimeter of the building and contouring of the hardstanding areas.

6.6.6 Landscaped areas should be incorporated into the layout where possible, and the associated gardens will allow a proportion of the rainfall to infiltrate into the soil substrate.

6.6.7 Surface water will be directed runoff to watercourse. Due to the size, topography and flooding extent within the Site, it would not be feasible to provide surface water attenuation to be able to restrict runoff to the 5l/s minimum rate. A free discharge rate is therefore proposed.

6.6.8 It is proposed that the surface water outfall will be set at 155.00m AOD, exiting the retaining wall via a headwall into a swale feature, which would convey flows south to the River Don. It is recommended that scour protection is provided at the outfall and the swale feature would be turfed and would require basic maintenance (i.e. regular mowing, depending on the season) to maintained conveyance capacity.

6.6.9 A manhole will be positioned higher up the network from the outfall (above the retailing wall). The manhole cover level will be set at 156.20m AOD, +681mm above the 1 in 100-year flood level. This should provide confidence that the manhole is set above the 1 in 100-year (plus climate change) flood level, without the requirement of a model re-run. The manhole would allow surface water to spill out of the manhole and overland towards the River Don, if the outfall is surcharged.

6.6.10 An indicative drainage layout is in Drawing 011.

6.7 Foul Water

6.7.1 The site is not currently served by a foul drainage network. It is proposed that foul flow is discharged to the public foul sewer located within Old Mill Lane to the north of the Site. Based on the depth of the foul sewer and topography of the site, a gravity fed connection could be established.

6.7.2 In accordance with Sewers for Adoption (7th Edition), peak foul water discharge from a residential development can be considered to be 4,000 litres per property per day. Using this method, approximate foul flows can be calculated for the proposed residential development at 0.09l/s.

6.7.3 All new foul sewerage should be designed in accordance with Building Regulations Part H. In areas where sewers are to be adopted by Yorkshire Water, sewerage should be designed in accordance with Sewers for Adoption (7^{th} Edition) and supplemented with additional standards provided by Yorkshire Water.

6.7.4 An application to enter into a Section 104 agreement for sewer adoption must be made in writing to Yorkshire Water prior to any works commencing on Site. A connection point should be agreed with Yorkshire Water.

7.0 Summary and Conclusions

7.1 Introduction

7.1.1 A site-specific Flood Risk Assessment (FRA) has been undertaken for a proposed single residential development, located on land south of Old Mill Lane, Thurgoland, South Yorkshire.

7.2 Flood Risk

7.2.1 The risk of fluvial flooding is assessed as negligible to high, across the Site.

7.2.2 The risk of surface water flooding is assessed as negligible to high, across the Site.

7.2.3 The risk of flooding from all other sources is assessed as negligible.

7.3 Mitigation Measures

7.3.1 Flood risk can be mitigated to a negligible level through the following approach:

- Sequentially develop the Site, limiting the built development to Flood Zones 1 and 2 (low to medium risk).
- Provide an 8m easement free from development along the southern boundary, adjacent to the River Don. This easement would provide access for inspection and maintenance purposes, including vehicle access.
- Set finished floor levels above the 1 in 1000-year modelled flood levels (156.514m AOD) and +150mm threshold above external levels.
- Access/egress will be provided to the front of the property to Old Mill Lane, which is located within Flood Zone 1 (low risk) and outside the mapped extent of surface water flooding.
- The loss of floodplain would be negligible based on the scale of development (single dwelling within infill land). Due to the size of the Site, floodplain compensation is not feasible. The lower ground floor could be utilised as a garage (similar to the neighbouring property), which would accept flood water during a flood event.
- New owners of the property should register the property to Floodline: Floodline - 0345 988 1188 (24-hour service).
- Adoption of a surface water management strategy.

7.4 Flood Guidance

7.4.1 The proposed residential use is classified as 'more vulnerable'.

7.4.2 All development is acceptable within Flood Zones 1 and 2.

7.4.3 Subject to mitigation measures, the Sequential Test will be passed, and the Exception Test would not be required.

7.5 Site Drainage

7.5.1 The proposed development will increase the impermeable surfaces and therefore increase the amount of runoff.

7.5.2 Surface water will be directed runoff to watercourse. A free discharge rate is proposed. The use of attenuation would not be feasible due to the small size of the site,

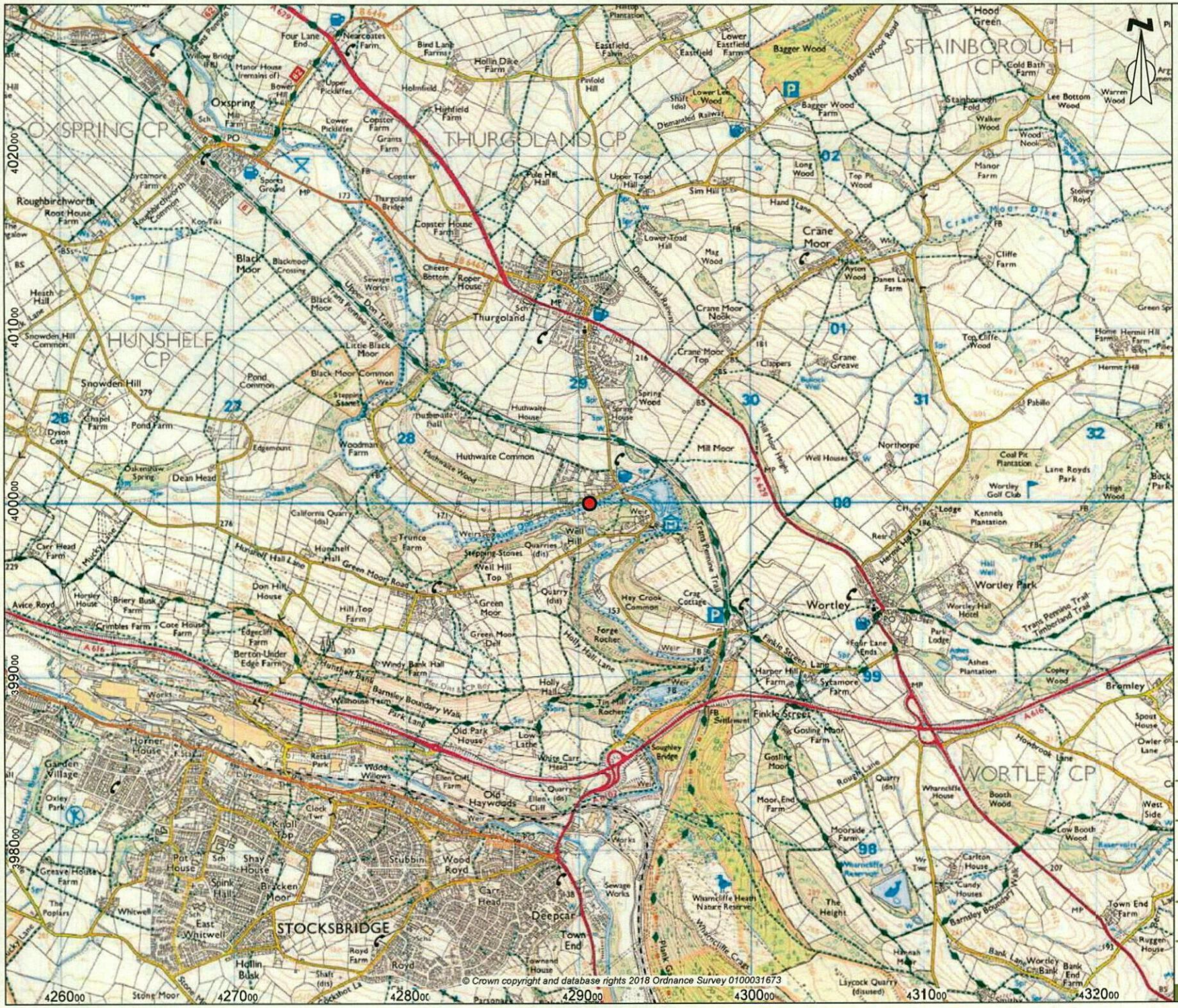
7.5.3 Foul flow would discharge to the public foul sewer network via a gravity fed connection.

7.6 Conclusion

7.6.1 This FRA demonstrates that the proposed development would be operated with minimal risk from flooding, would not increase flood risk elsewhere and is compliant with the requirements of national policy and guidance.

7.6.2 The development should not therefore be precluded on the grounds of flood risk, as well as surface water and foul drainage.

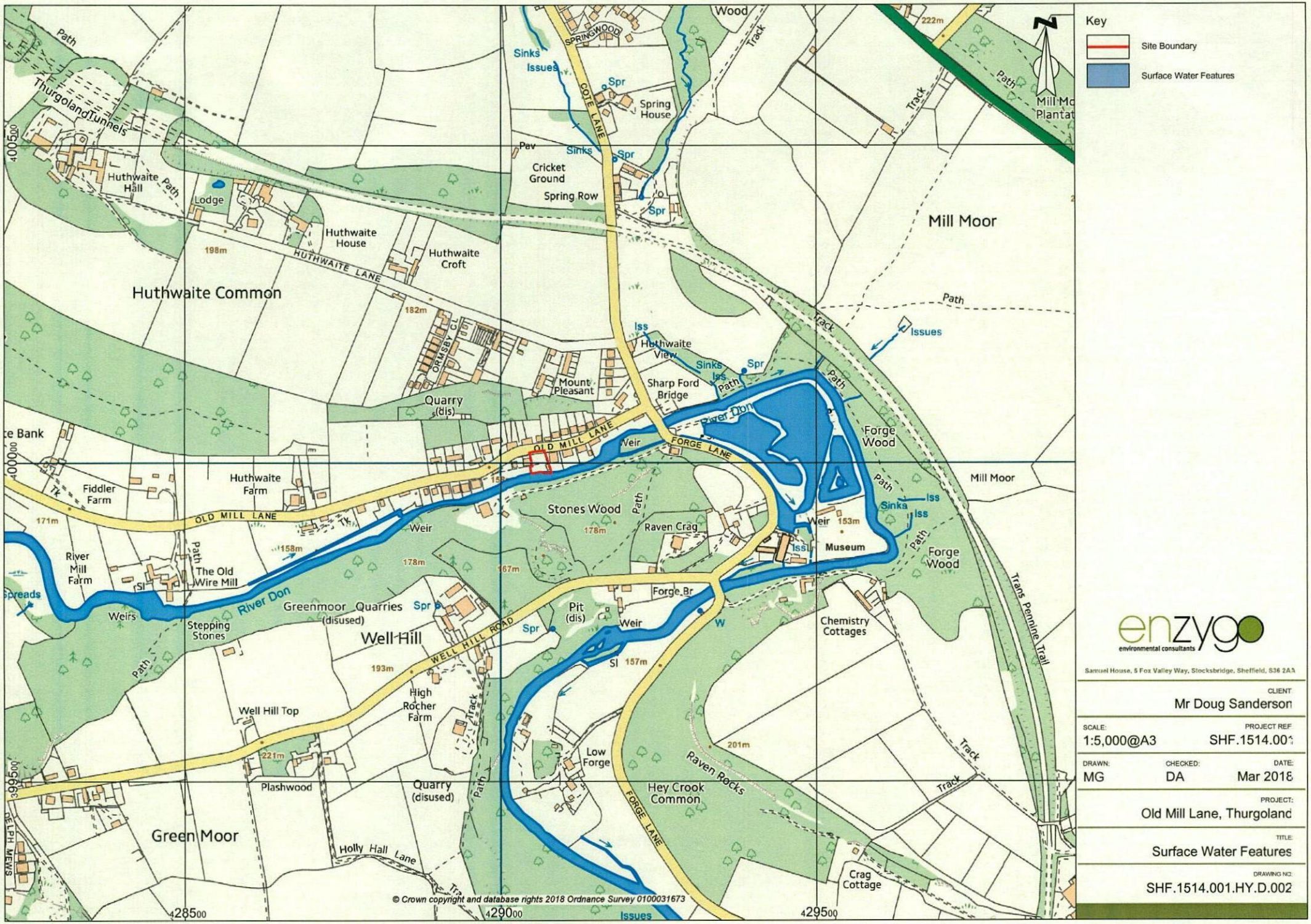
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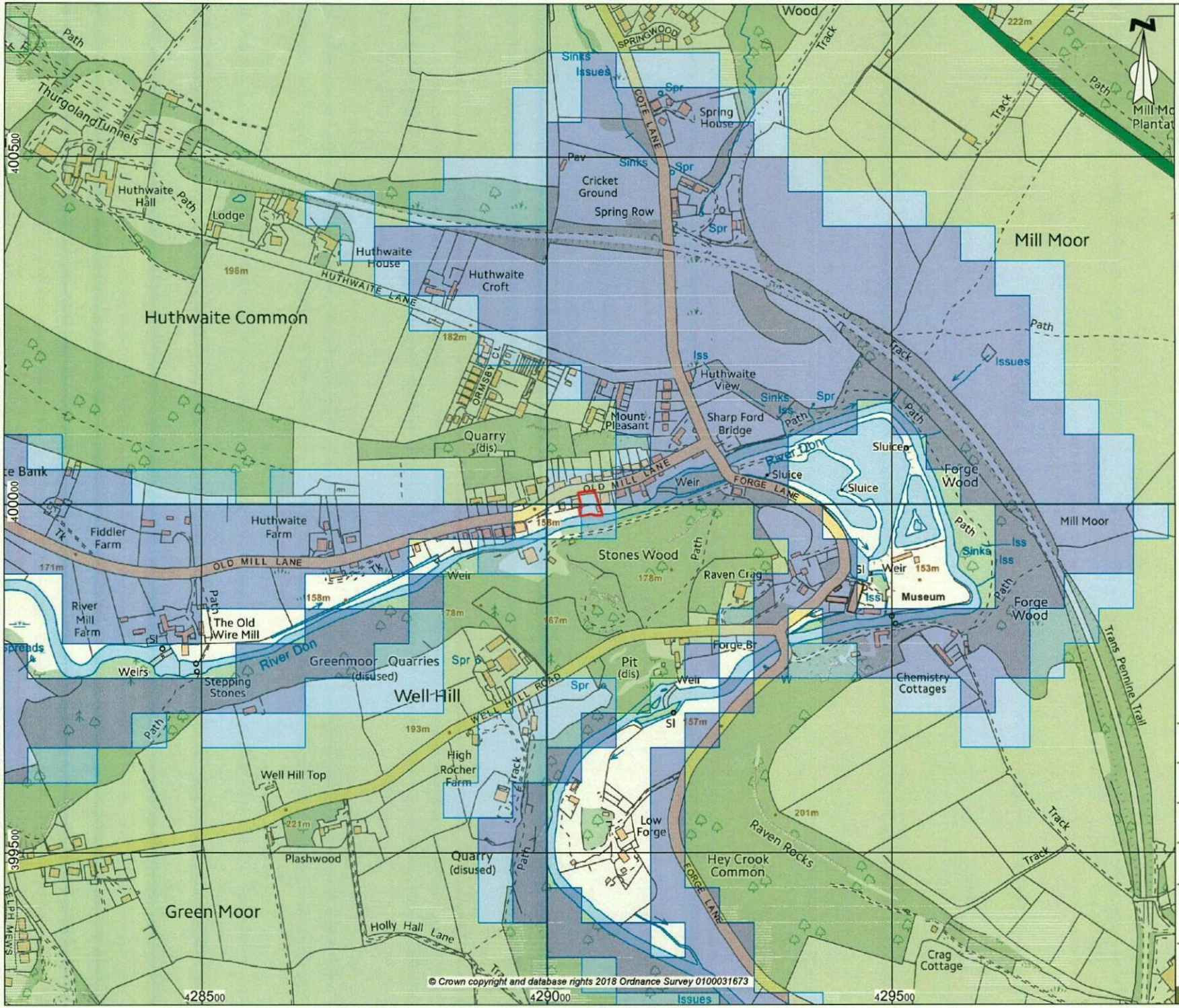


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CLIENT	Mr Doug Sanderson
SCALE: 1:20,000@A3	PROJECT REF: SHF.1514.001
DRAWN: MG	CHECKED: DA
DATE	Mar 2018
PROJECT	Old Mill Lane, Thurgoland
TITLE	Site Location Plan
DRAWING NO	SHF.1514.001.HY.D.001


Key
Site Boundary
Surface Water Features
Huthwaite Common
Mill Moor
Green Moor
Well Hill
Hey Crook Common
Huthwaite Hall
Lodge
Huthwaite House
Huthwaite Croft
Huthwaite Farm
Fiddler Farm
Huthwaite View
Mount Pleasant
Sharp Ford Bridge
Spring House
Cricket Ground
Spring Row
Quarry (dis)
Quarry (disused)
Pit (dis)
Greenmoor Quarries (disused)
Stones Wood
Raven Crag
Forge Wood
Museum
The Old Wire Mill
River Mill Farm
Stepping Stones
Weirs
High Rocher Farm
Well Hill Top
Plashwood
Low Forge
Forge Br
Chemistry Cottages
Crag Cottage
Raven Rocks
Thurgoland Tunnels
River Don
OLD MILL LANE
HUTHWAITE LANE
WELL HILL ROAD
FORGE LANE
COTE LANE
SPRINGWOOD
ORMSBY CL
HOLLY HALL LANE
DELPH MEWS
Trans Pennine Trail
Weir
Sinks
Issues
Spr
Path
Track
Pav
Iss
Sl
Tk
198m
182m
171m
158m
178m
167m
153m
157m
193m
221m
201m
222m
4005 00
3995 00
4000 00
4285 00
4290 00
4295 00
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Samuel House, 5 Fox Valley Way, Stocksbridge, Sheffield, S36 2AA
CLIENT: Mr Doug Sanderson
SCALE: 1:5,000@A3
PROJECT REF: SHF.1514.001
DRAWN: MG
CHECKED: DA
DATE: Mar 2018
PROJECT: Old Mill Lane, Thurgoland
TITLE: Surface Water Features
DRAWING NO: SHF.1514.001.HY.D.002



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PROJECT REF: SHF.1514.001

DRAWN: MG

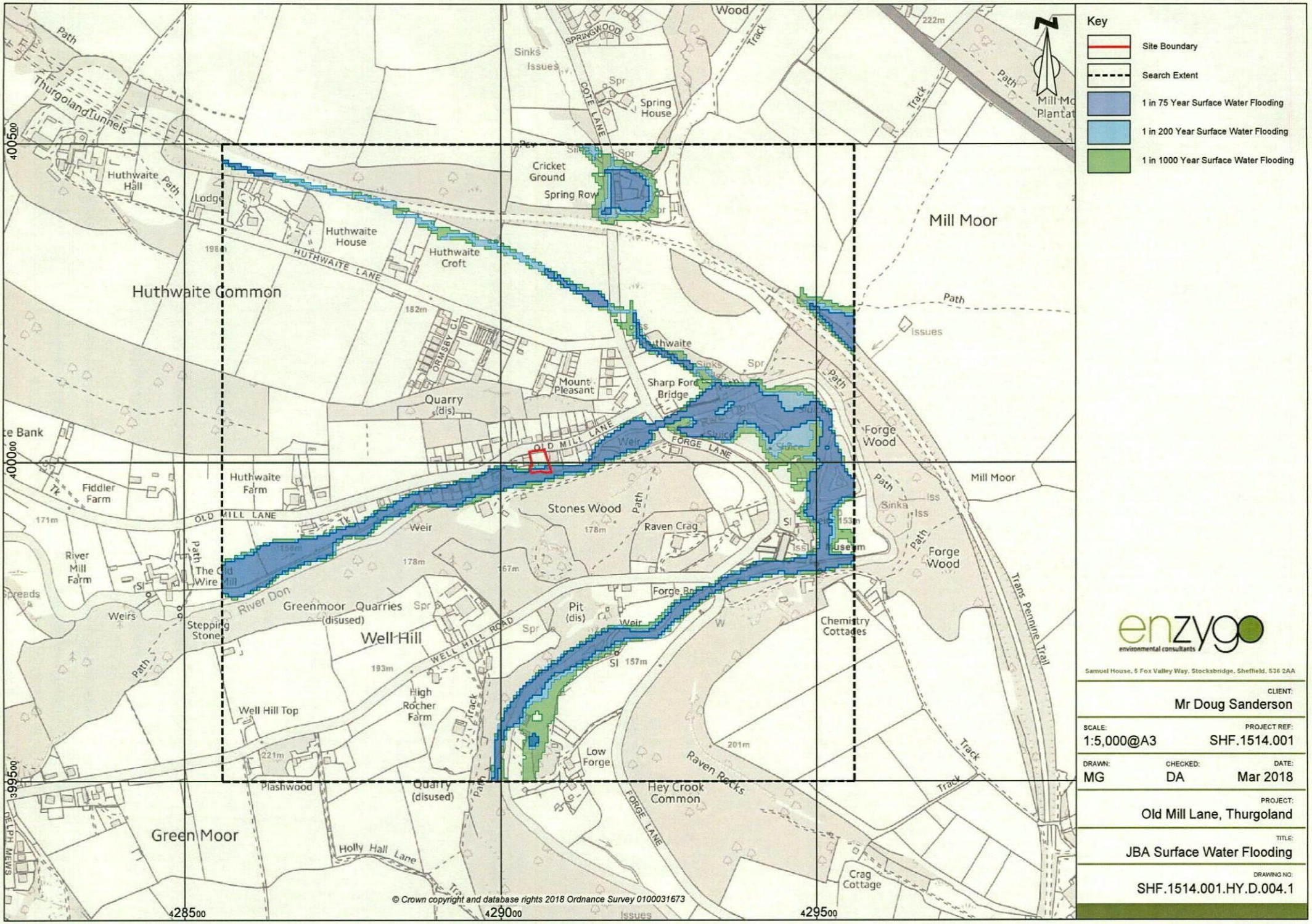
CHECKED: DA

DATE: Mar 2018

PROJECT: Old Mill Lane, Thurgoland

TITLE: BGS Groundwater Flooding Susceptibility

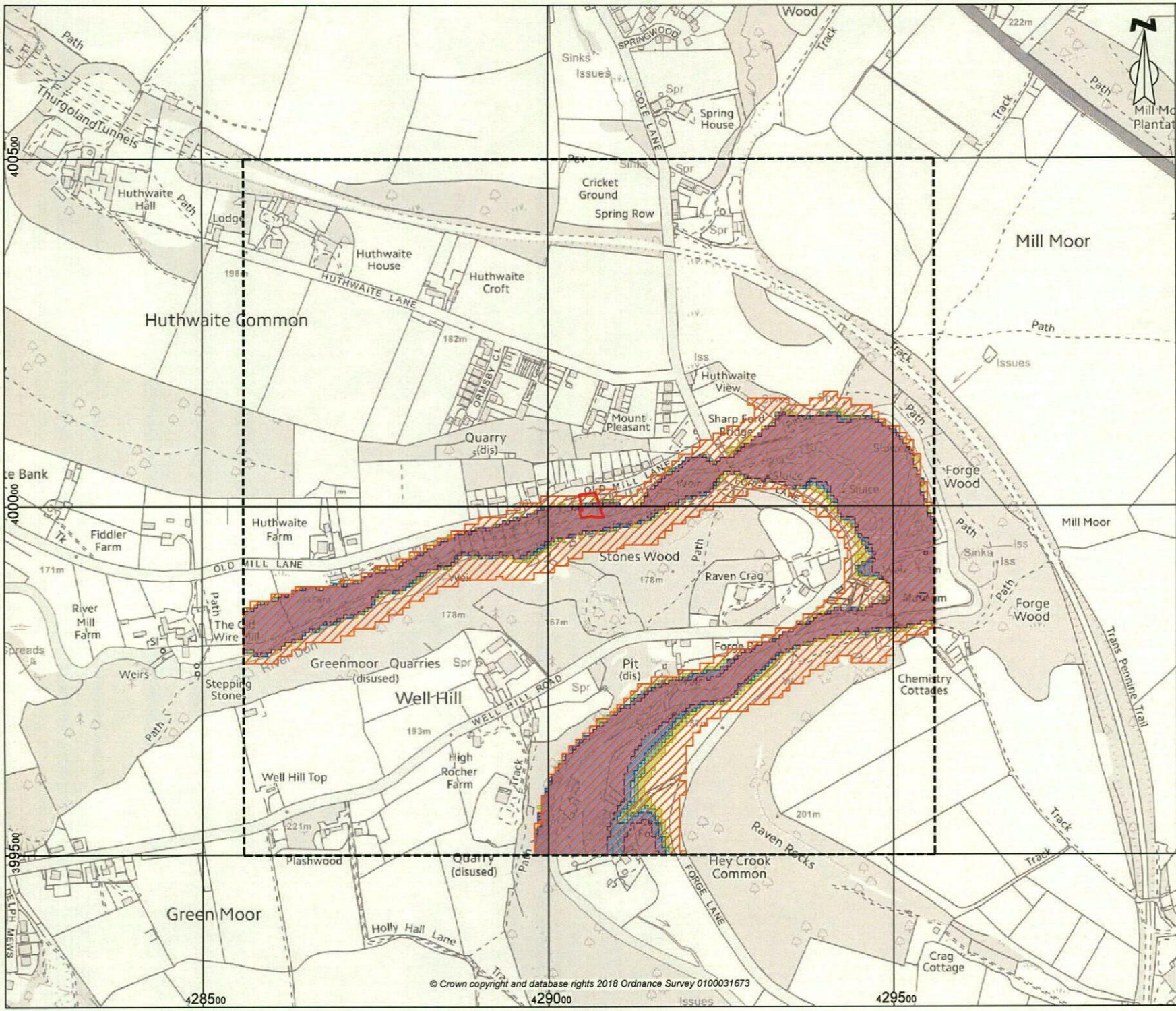
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PROJECT REF:	SHF.1514.001
DRAWN:	MG
CHECKED:	DA
DATE:	Mar 2018
PROJECT:	Old Mill Lane, Thurgoland
TITLE:	JBA Surface Water Flooding
DRAWING NO:	SHF.1514.001.HY.D.004.1



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PROJECT REF: SHF.1514.001

DRAWN: MG

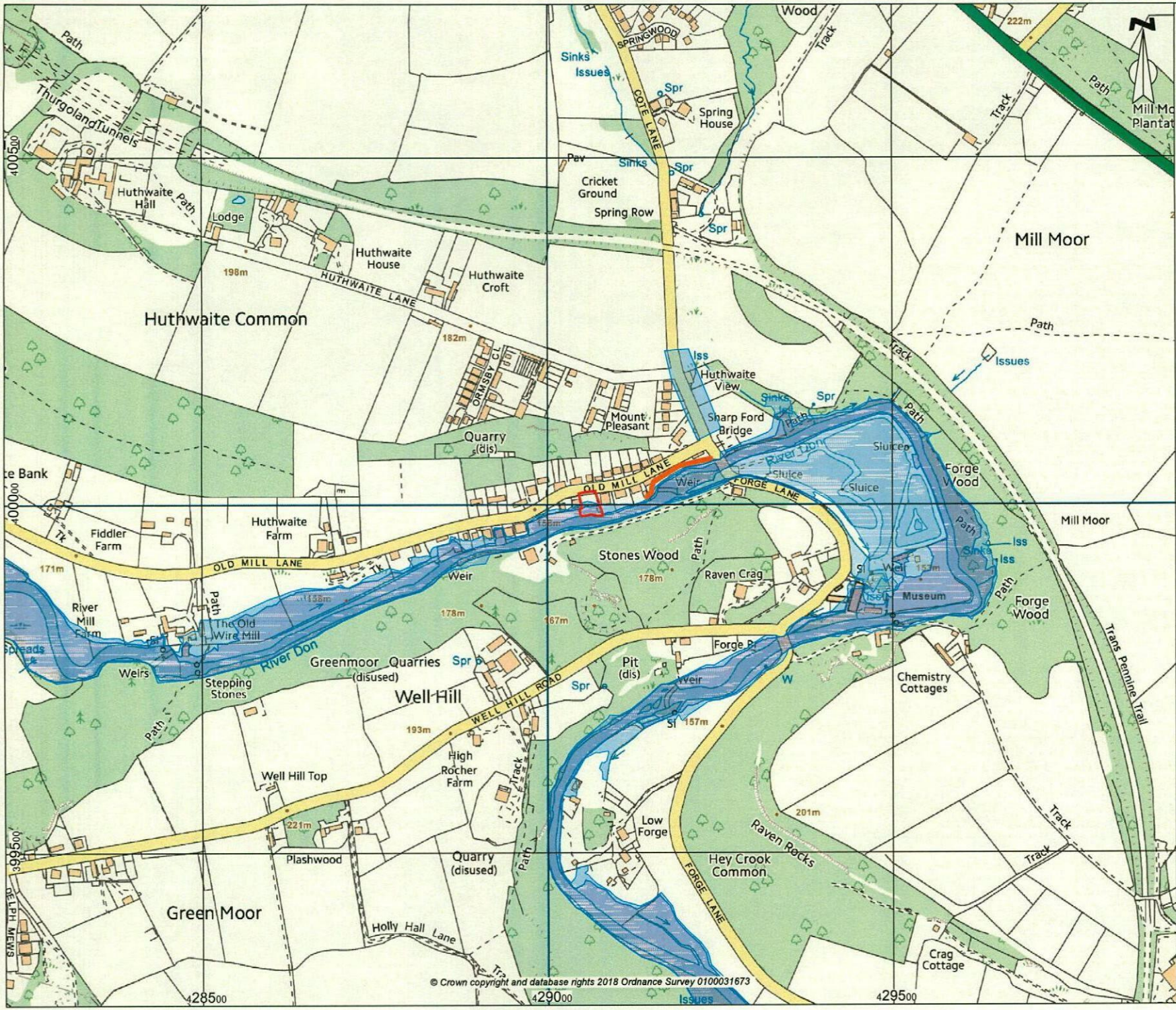
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DATE: Mar 2018

PROJECT: Old Mill Lane, Thurgoland

TITLE: JBA Flooding from Rivers

DRAWING NO: SHF.1514.001.HY.D.004.2



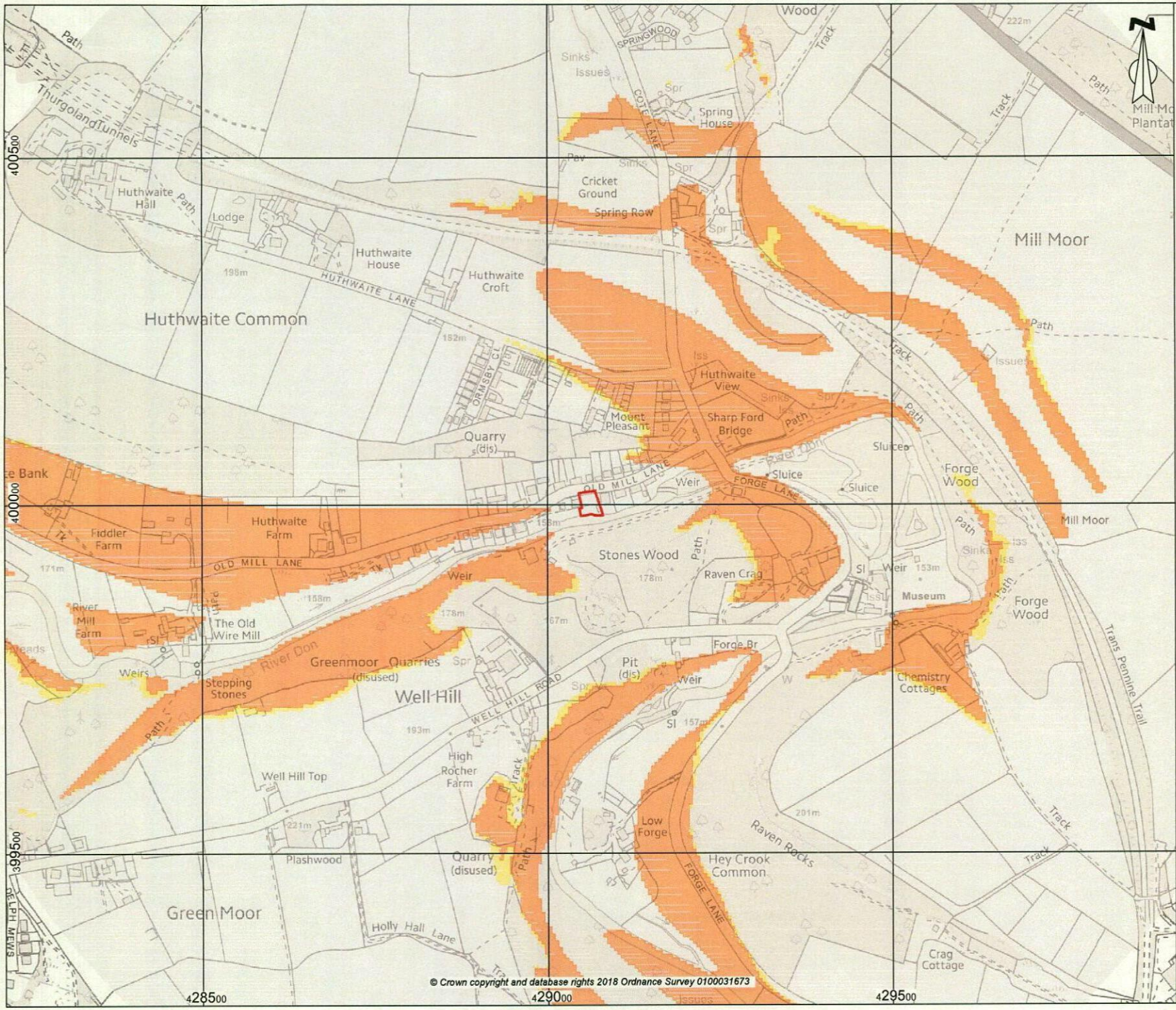
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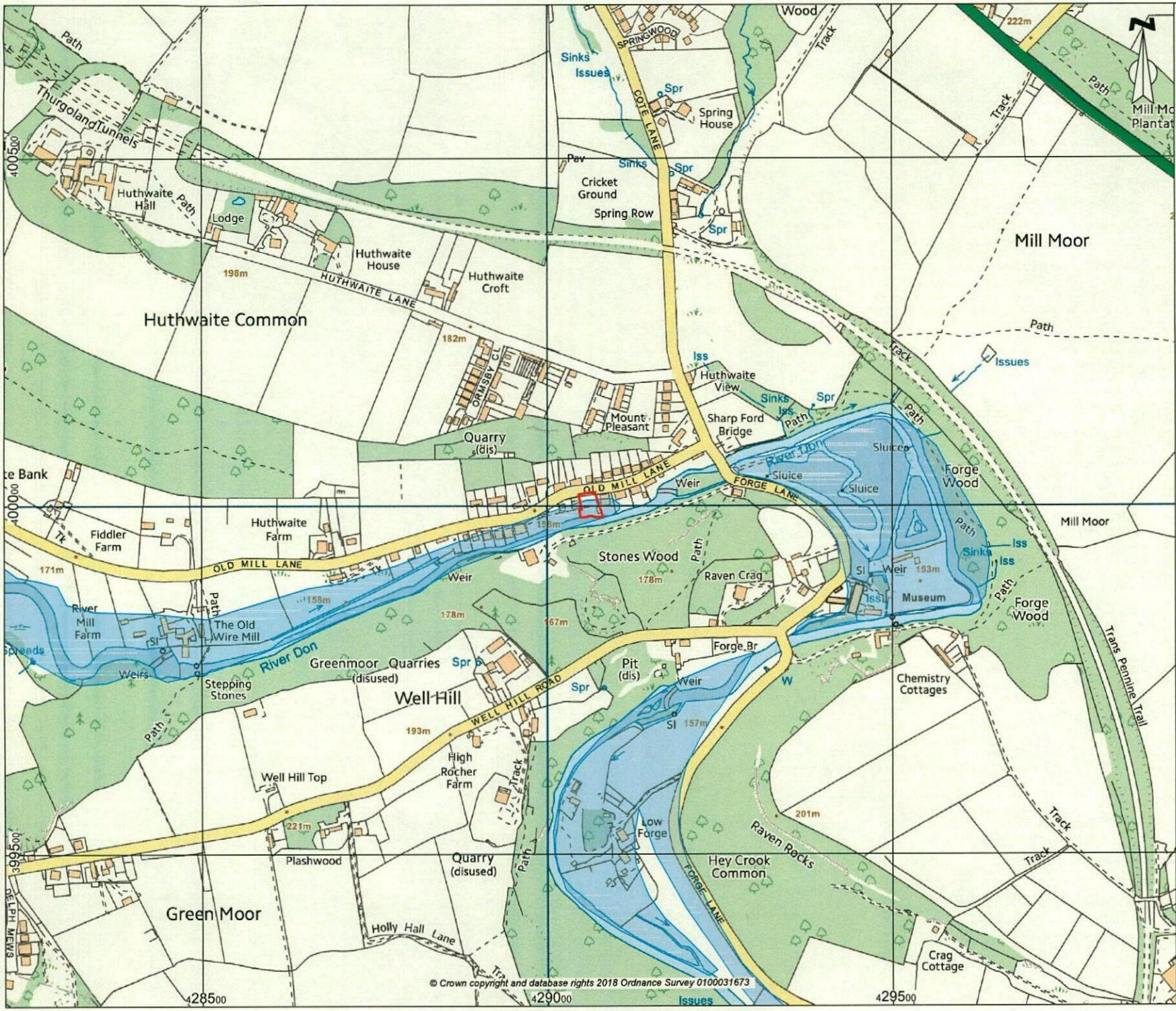
CLIENT:	Mr Doug Sanderson
SCALE:	1:5,000@A3
PROJECT REF:	SHF.1514.001
DRAWN:	MG
CHECKED:	DA
DATE:	Mar 2018
PROJECT:	Old Mill Lane, Thurgoland
TITLE:	Environment Agency Flood Zones
DRAWING NO:	SHF.1514.001.HY.D.005



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CLIENT:	Mr Doug Sanderson
SCALE:	1:5,000@A3
PROJECT REF:	SHF.1514.001
DRAWN:	MG
CHECKED:	DA
DATE:	Mar 2018
PROJECT:	Old Mill Lane, Thurgoland
TITLE:	Groundwater Flood Risk Map
DRAWING NO:	SHF.1514.001.HY.D.006



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CLIENT: Mr Doug Sanderson

SCALE: 1:5,000@A3

PROJECT REF: SHF.1514.001

DRAWN: MG

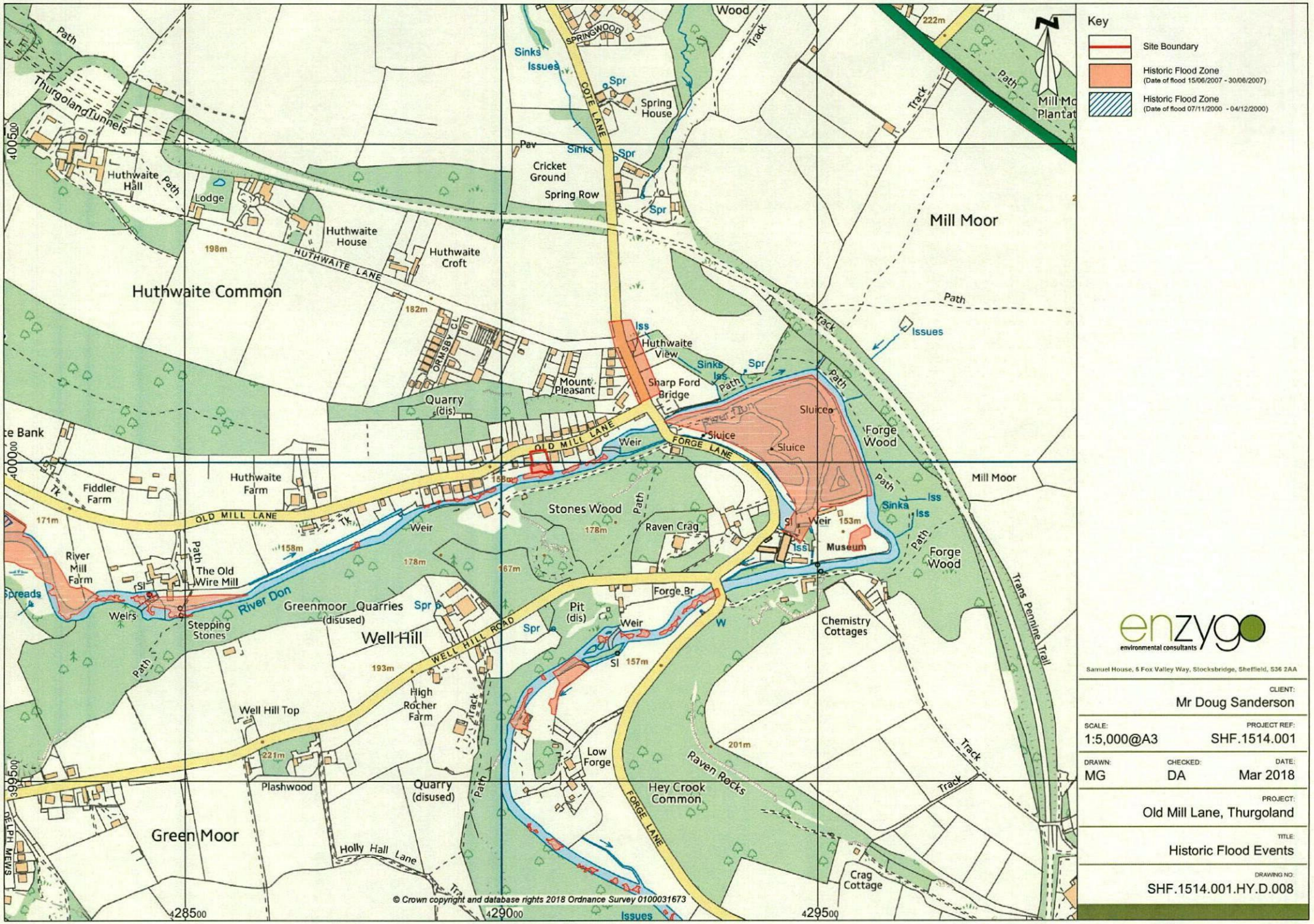
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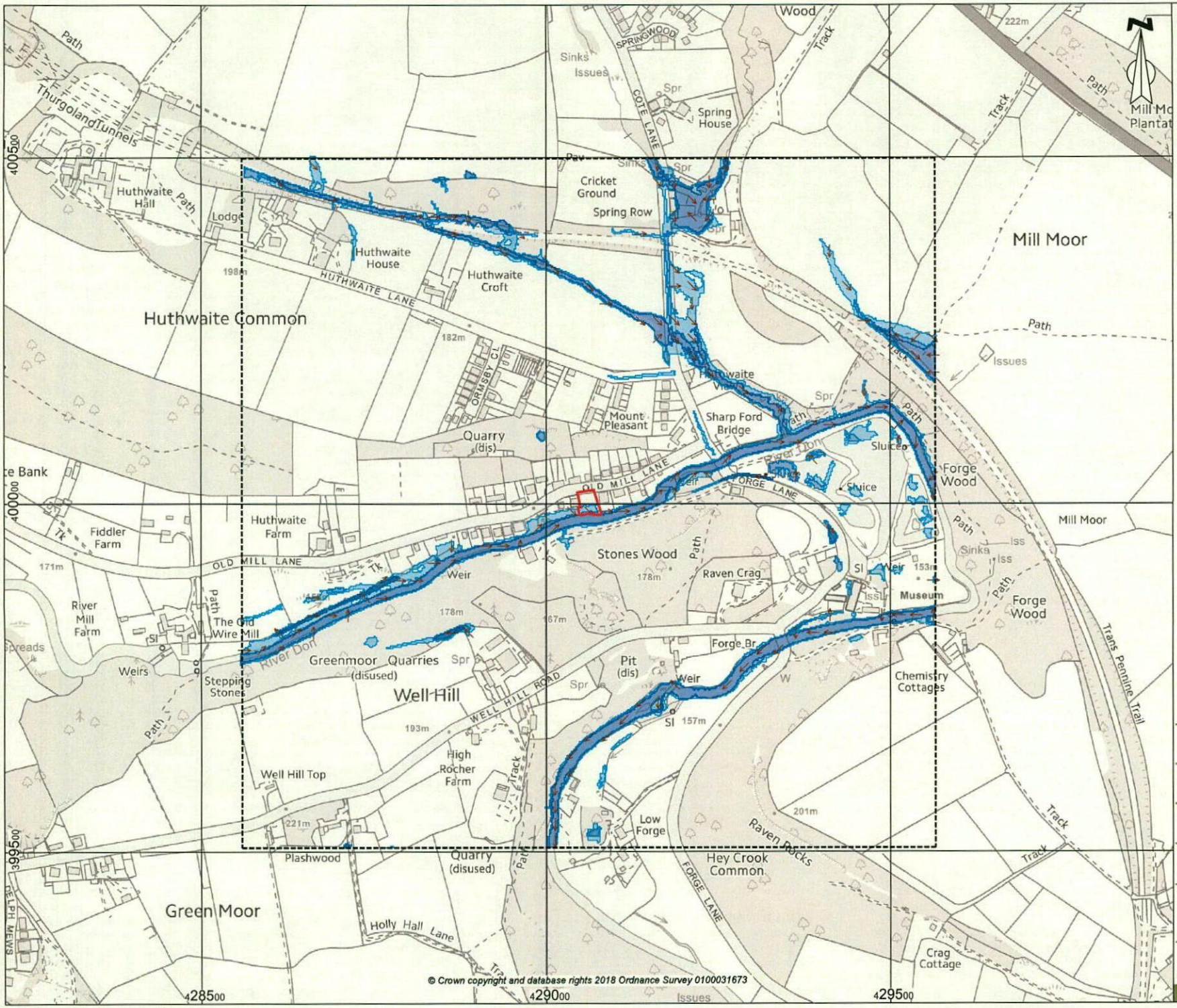
DATE: Mar 2018

PROJECT: Old Mill Lane, Thurgoland

TITLE: Geological Indicators of Flooding (based on geological deposits)

DRAWING NO: SHF.1514.001.HY.D.007

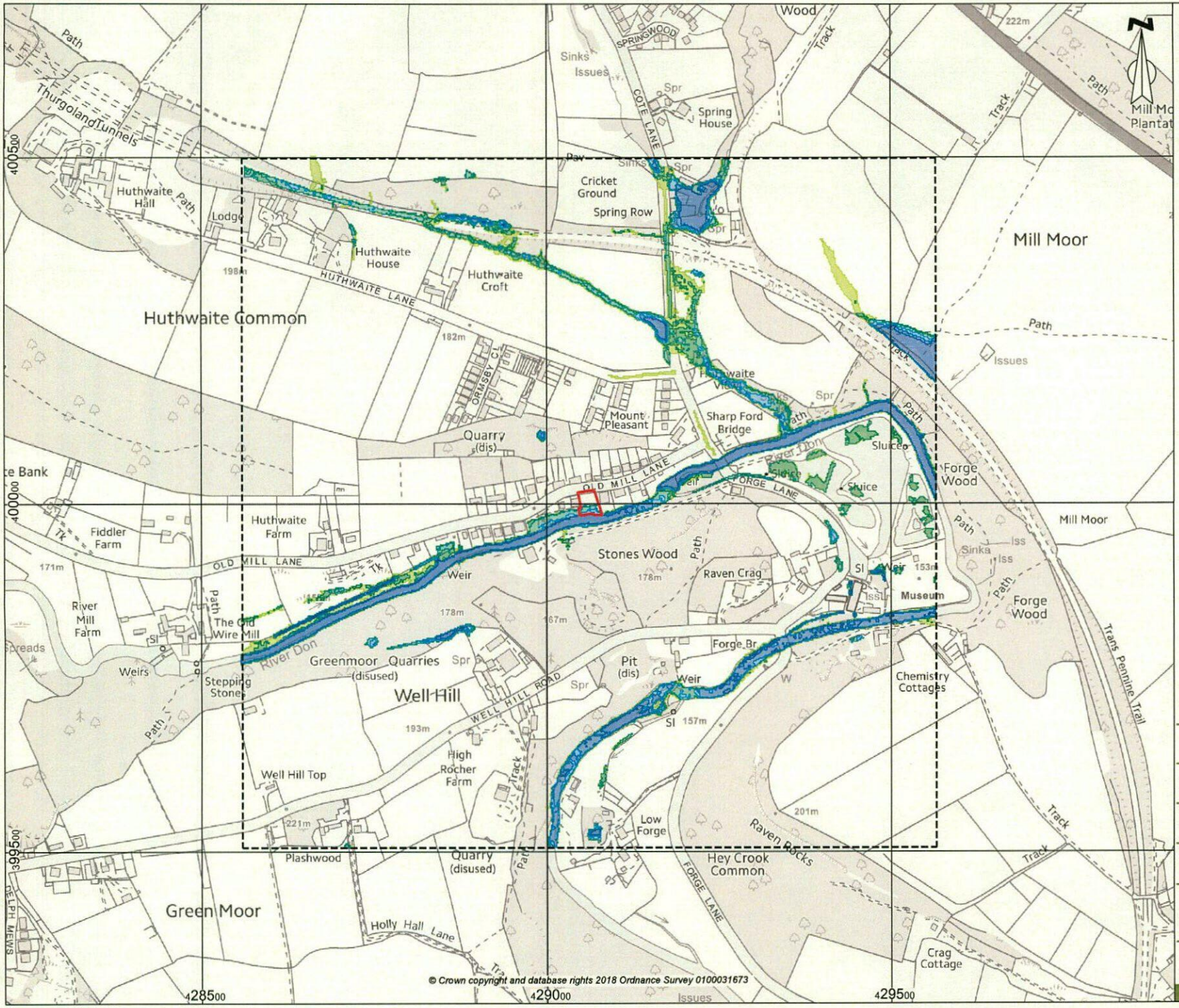

Key
Site Boundary
Historic Flood Zone
(Date of flood 15/06/2007 - 30/06/2007)
Historic Flood Zone
(Date of flood 07/11/2000 - 04/12/2000)
N
Huthwaite Common
Mill Moor
Stones Wood
Forge Wood
Well Hill
Green Moor
Hey Crook Common
Huthwaite Hall
Lodge
Huthwaite House
Huthwaite Croft
Huthwaite View
Mount Pleasant
Sharp Ford Bridge
Spring House
Spring Row
Cricket Ground
Fiddler Farm
Huthwaite Farm
River Mill Farm
The Old Wire Mill
Stepping Stones
Weirs
River Don
Greenmoor Quarries (disused)
Quarry (dis)
Pit (dis)
Quarry (disused)
Well Hill Top
High Rocher Farm
Plashwood
Holly Hall Lane
Low Forge
Forge Br
Chemistry Cottages
Crag Cottage
Raven Crag
Raven Rocks
Museum
Sluice
Weir
Trans Pennine Trail
Thurgoland Tunnels
Sinks
Issues
Spr
Iss
Sl
Path
Track
Pav
Tk
Wood
Mill Moor
Plantat
COTE LANE
SPRINGWOOD
HUTHWAITE LANE
ORMSBY CL
OLD MILL LANE
FORGE LANE
WELL HILL ROAD
DELPH MEWS
198m
182m
171m
158m
178m
167m
153m
193m
221m
201m
157m
222m
4005 00
4000 00
3995 00
285 00
290 00
295 00
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environmental consultants
Samuel House, 5 Fox Valley Way, Stocksbridge, Sheffield, S36 2AA
CLIENT:
Mr Doug Sanderson
SCALE:
1:5,000@A3
PROJECT REF:
SHF.1514.001
DRAWN:
MG
CHECKED:
DA
DATE:
Mar 2018
PROJECT:
Old Mill Lane, Thurgoland
TITLE:
Historic Flood Events
DRAWING NO:
SHF.1514.001.HY.D.008



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CLIENT:	Mr Doug Sanderson
SCALE:	1:5,000@A3
PROJECT REF:	SHF.1514.001
DRAWN:	MG
CHECKED:	DA
DATE:	Mar 2018
PROJECT:	Old Mill Lane, Thurgoland
TITLE:	Environment Agency Surface Water Flow Paths
DRAWING NO:	SHF.1514.001.HY.D.009.1



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SCALE: 1:5,000@A3

PROJECT REF: SHF.1514.001

DRAWN: MG

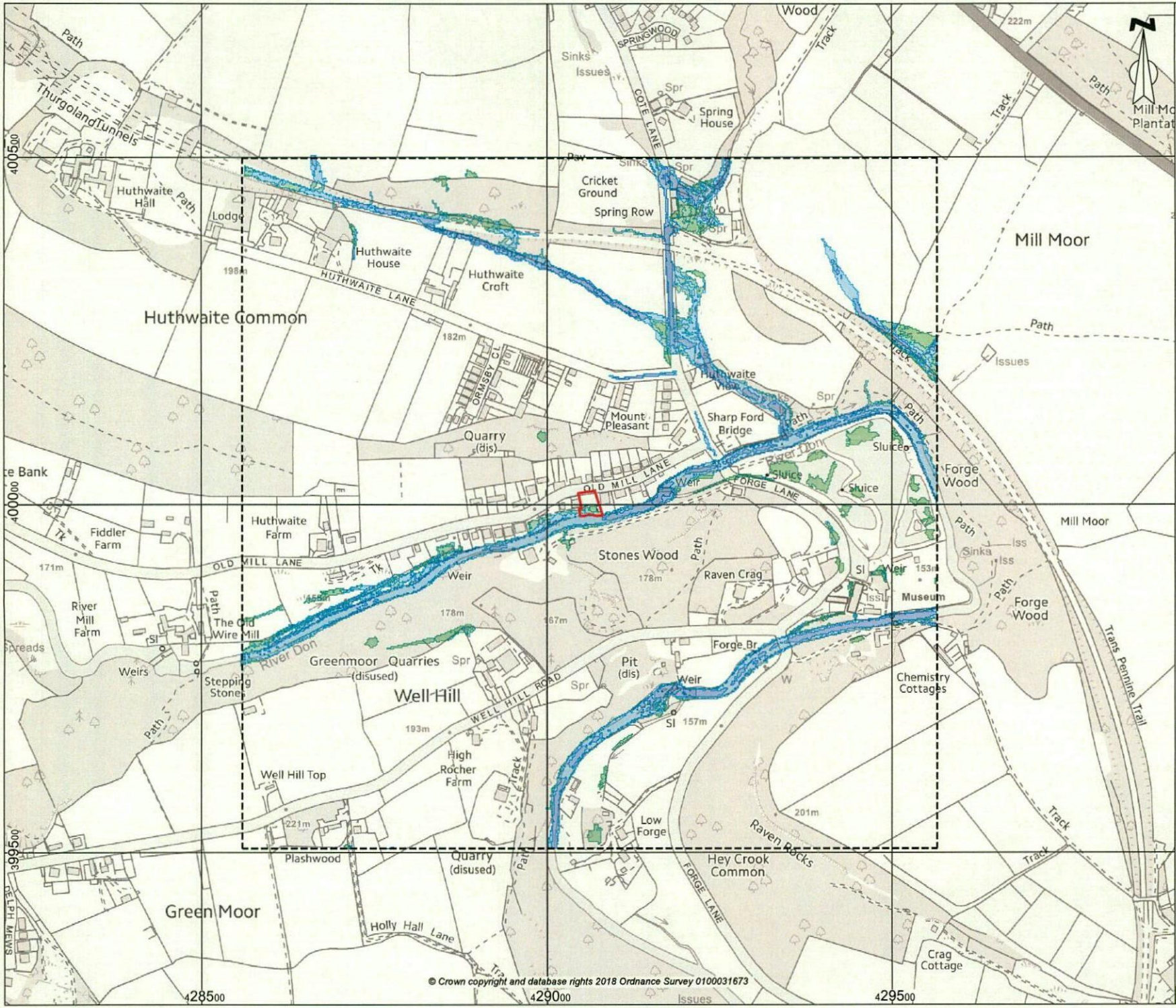
CHECKED: DA

DATE: Mar 2018

PROJECT: Old Mill Lane, Thurgoland

TITLE: Environment Agency 1 in 1000 Year Surface Water Depth

DRAWING NO: SHF.1514.001.HY.D.009.2



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CLIENT: Mr Doug Sanderson

SCALE: 1:5,000@A3

PROJECT REF: SHF.1514.001

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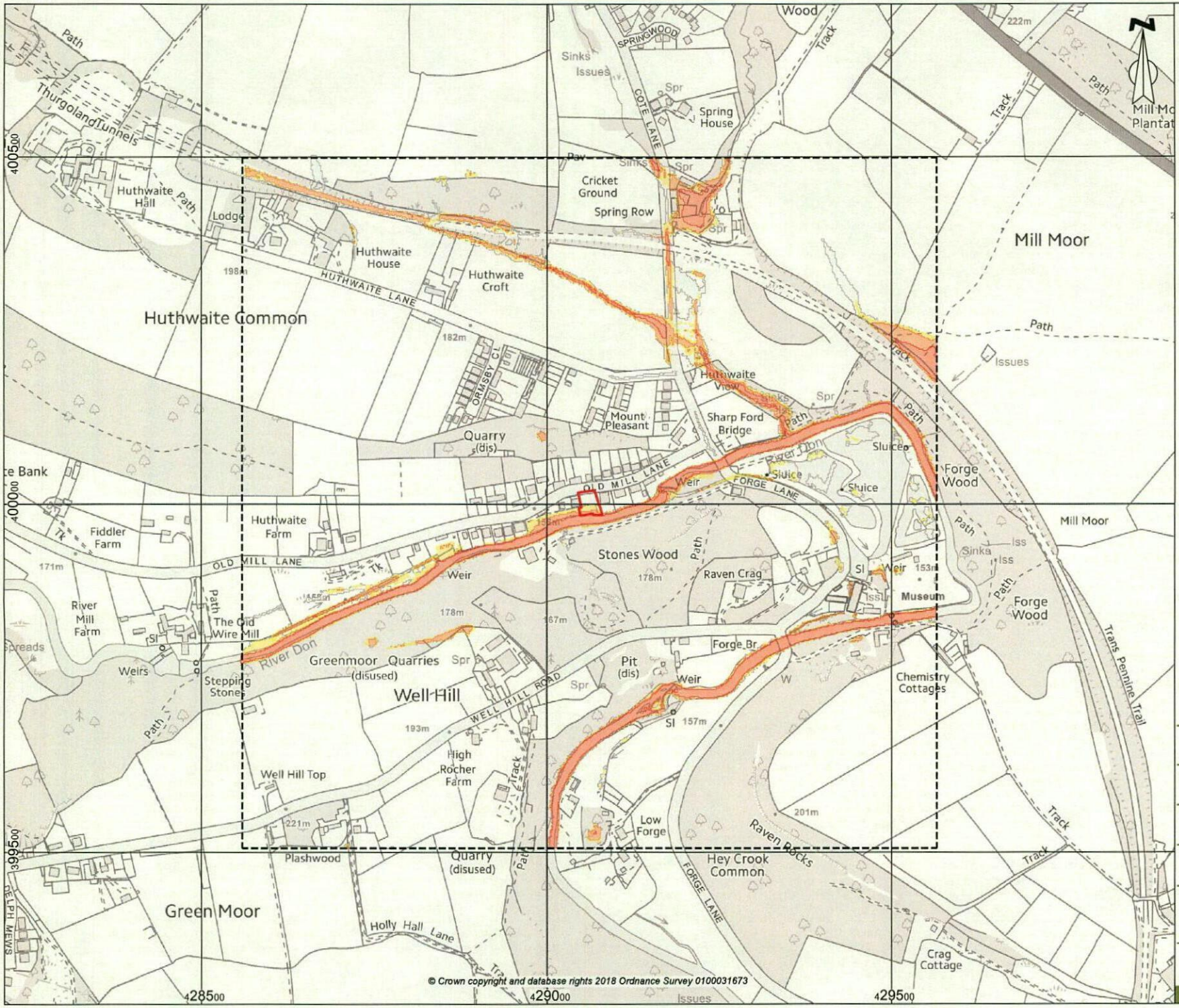
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DATE: Mar 2018

PROJECT: Old Mill Lane, Thurgoland

TITLE: Environment Agency 1 in 1000 Year Surface Water Velocity

DRAWING NO: SHF.1514.001.HY.D.009.3



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CLIENT: Mr Doug Sanderson

SCALE: 1:5,000@A3

PROJECT REF: SHF.1514.001

DRAWN: MG

CHECKED: DA

DATE: Mar 2018

PROJECT: Old Mill Lane, Thurgoland

TITLE: Environment Agency Surface Water 1000 Year Hazard Rating

DRAWING NO: SHF.1514.001.HY.D.009.4



Key

- Site Boundary
- 1 in 25 Year Flooding
- 1 in 100 Year Flooding
- 1 in 1000 Year Flooding

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CLIENT: Mr Doug Sanderson

SCALE: 1:200@A3

PROJECT REF: SHF.1514.001

DRAWN: MG

CHECKED: DA

DATE: Mar 2018

PROJECT: Old Mill Lane, Thurgoland

TITLE: Modelled Flood Extent

DRAWING NO: SHF.1514.001.HY.D.010



NOTES

1. Do not scale from this drawing
2. All dimensions are in meters unless stated otherwise
3. This drawing is to be read in conjunction with all relevant drawings and documents associated with this project.
4. All surveyed information including levels and layout is provided by others
5. All existing and proposed dimensions, levels and locations to be checked and verified by the main contractor on site prior to the commencement of the works and any anomalies reported to the engineer.
6. All works, workmanship and materials on private drainage to be in accordance with the civil engineering specification for water industry 7th edition published by the water research council.

REV:	DATE:	DETAIL:	DES:	CHK:	APP:
P01	16/03/18	First Issue	MJ	DA	MT

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CLIENT: Mr Doug Sanderson

PROJECT: Old Mill Lane, Thurgoland

DRAWING TITLE: Surface Water Outfall (Planning)

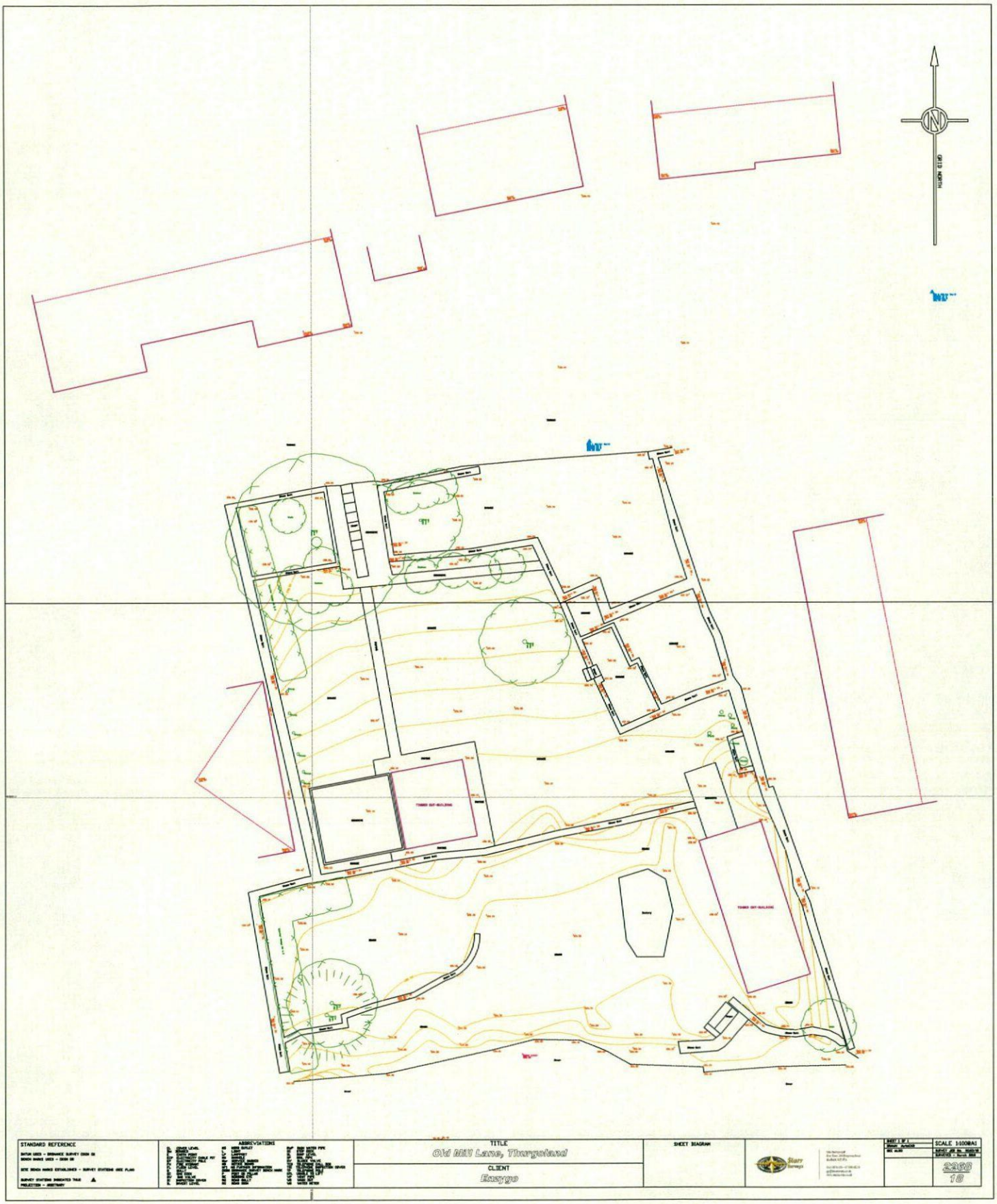
DRAWN:	DESIGNED:	CHECKED:	APPROVED:
MJ	MJ	DA	MT

DATE:	SCALE @ A3:
16/03/2017	1:200
PROJECT NO.:	DRAWING NO.:
SHF.1514.001	11
DRAWING STATUS:	ISSUE:
Preliminary	P01

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APPENDICES

Appendix 1 – Topographic Survey



STANDARD REFERENCE

DATUM USED = ORDNANCE SURVEY DATUM OD

BENCH MARKS USED = DATUM OD

SITE BENCH MARKS ESTABLISHED = SURVEY STATIONS AND PLAN

SURVEY STATIONS INDICATED THUS ▲

PROJECTION = ARBITRARY

ABBREVIATIONS

TITLE

Old Mill Lane, Thurgoland

CLIENT

Ensygo

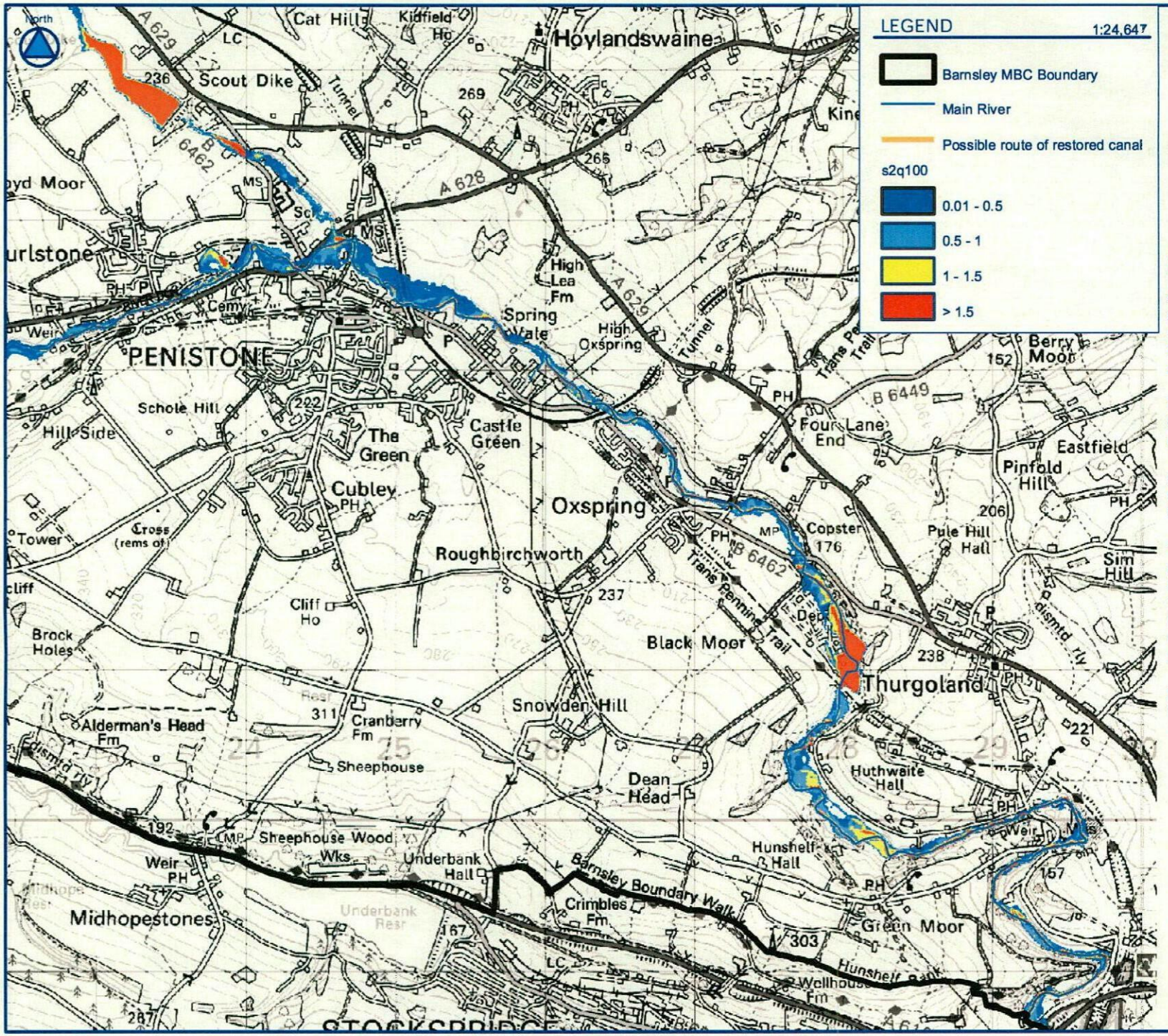
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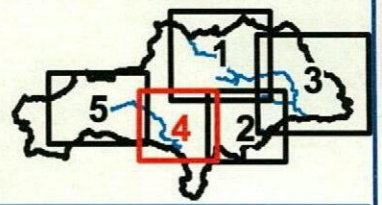
2268

18

Appendix 2 – SFRA Mapping



KEYPLAN



Note:
This map shows the potential scale of flood inundation for a range of severe overtopping flood events and different standards of flood defence. They do not include the impact of a breach or failure of these defences.

Typical range of defence standards for the River Don and Dearne is to protect up to a 1 in 30year (3%) return period.

s2 = 1 in 2year Standard of Defence
q100 = 1 in 100year or 1% probability flood event.

This map should be considered in support of the Environment Agency Flood Zone Maps to aid the Sequential and Exception Tests.
It should not be considered in isolation without reference to the other SFRA Flood Risk Maps.

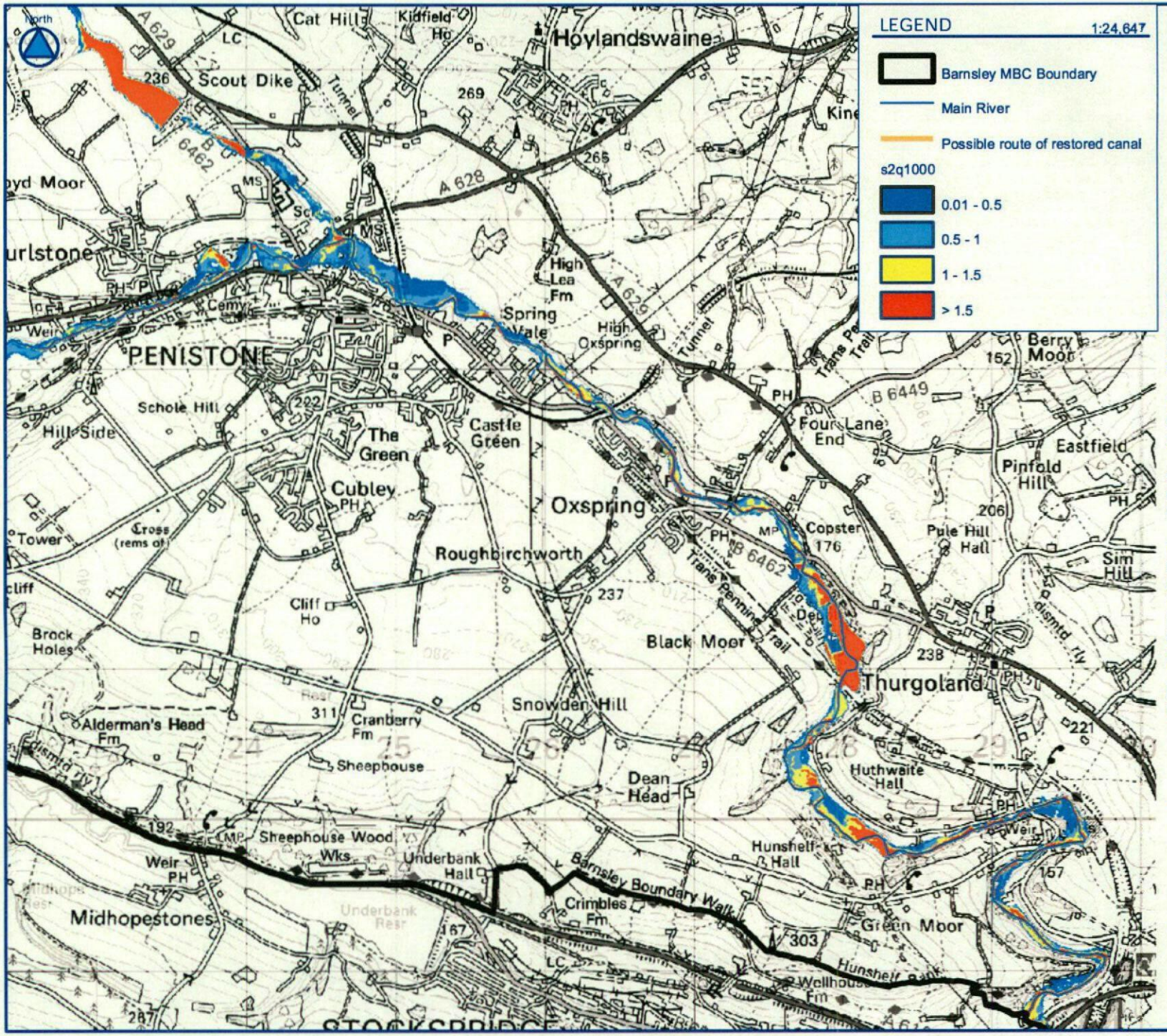
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MAP D - 4

s2q100



LEGEND 1:24,647

- Barnsley MBC Boundary
- Main River
- Possible route of restored canal

s2q1000

- 0.01 - 0.5
- 0.5 - 1
- 1 - 1.5
- > 1.5

KEYPLAN



Note:
This map shows the potential scale of flood inundation for a range of severe overtopping flood events and different standards of flood defence. They do not include the impact of a breach or failure of these defences.

Typical range of defence standards for the River Don and Dearne is to protect up to a 1 in 30year (3%) return period.

s2 = 1 in 2year Standard of Defence
q1000 = 1 in 1000year or 0.1% probability flood event.

This map should be considered in support of the Environment Agency Flood Zone Maps to aid the Sequential and Exception Tests.
It should not be considered in isolation without reference to the other SFRA Flood Risk Maps.

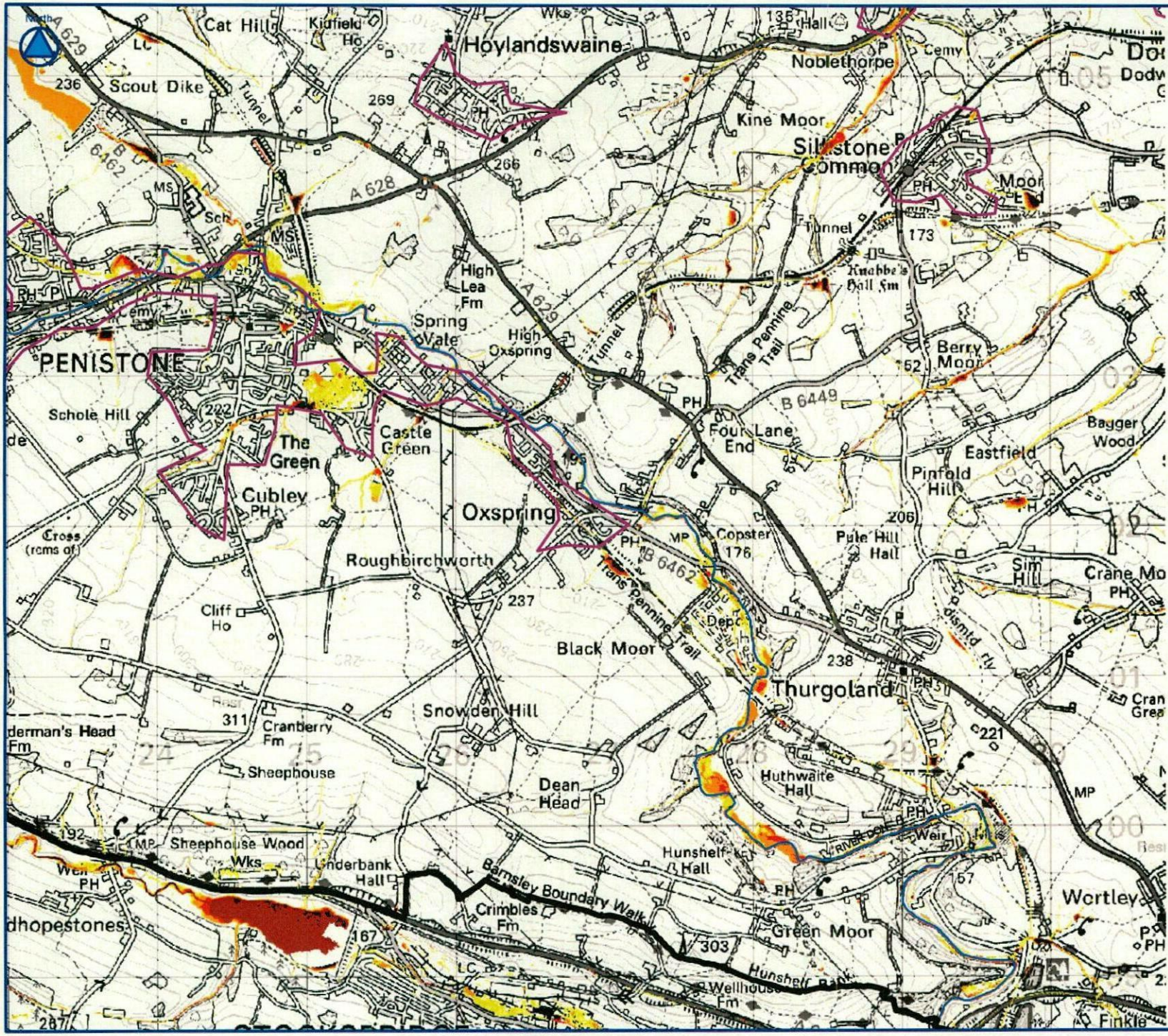
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MAP E - 4

s2q1000



KEYPLAN



LEGEND 1:24,647

- Barnsley MBC Boundary
- Urban Areas
- Main River

Surface Water Flooding

Flood Depth (m)

- 0.15 - 0.3
- 0.3 - 0.5
- 0.5 - 1
- 1 - 1.5
- 1 - 2
- > 2

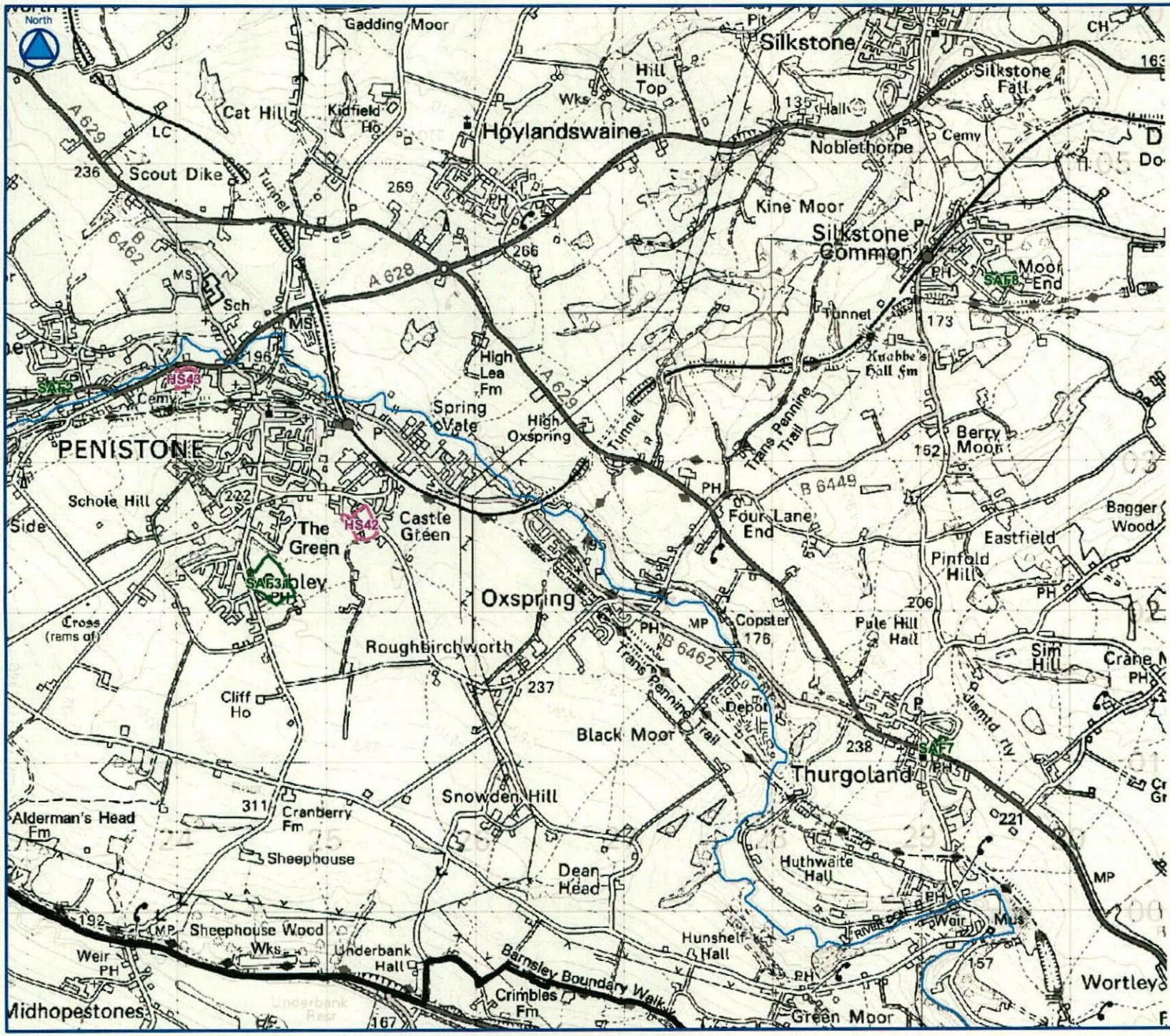
Note:
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MAP C - 4

PLUVIAL FLOODING CAUSED BY 100YEAR RAINSTORM



KEYPLAN



LEGEND 1:24,647

- Barnsley MBC Boundary
- IDB Boundaries
- Main River
- Possible route of restored canal

Proposed Development Sites

- Employment Sites
- Housing Sites
- UDP Sites
- Safeguarded Land

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MAP B - 4

PROPOSED DEVELOPMENT SITES AND IDB BOUNDARIES

Appendix 3 – Yorkshire Water Utility Asset Plans

YORKSHIRE WATER
PROTECTION OF MAINS AND SERVICES

1. The position of Yorkshire Water Services Ltd (YWS) apparatus shown on the existing mains record drawing(s) indicates the ***general*** position and nature of our apparatus and the accuracy of this information cannot be guaranteed. Any damage to YWS apparatus as a result of your works may have serious consequences and you will be held responsible for all costs incurred. Prior to commencing major works, the exact location of apparatus must be determined on site, if necessary by excavating trial holes. The actual position of such apparatus and that of service pipes which have not been indicated must be established on site by contacting the Customer Helpline on 0845 124 24 24 for both water and sewerage.

2. The public sewer and water network is lawfully retained in its existing position and the sewerage and water undertaker is entitled to have it remain so without any disturbance. The provisions of section 159 of the Water Industry Act 1991 provides that the undertaker may "inspect, maintain, adjust, repair or alter" the network. Those rights are given to enable the undertaker to perform its statutory duties. Any development of the land or any other action that unacceptably hindered the exercise of those rights would be unlawful. The provisions contained in Section 185 of the Water Industry Act 1991 state that where it is reasonable to do so, a person may require the water supply undertaker to alter or remove a pipe where it is necessary to enable that person to carry out a proposed change of use of the land. The provisions contained in Section 185 also require the person making the request to pay the full cost of carrying out the necessary works.

3. Ground levels over existing YWS apparatus are to be maintained. Sewers in highways will ***generally*** be laid to give 1200mm of cover from finished ground level working to kerb races, other permanent identification of the limits of the road or to an agreed line and level. Substantial increases or decreases to this 1200mm depth of cover will result in the sewer being re-laid at your expense. Water mains and services will ***generally*** be laid with a minimum of 750mm depth of cover however some mains and services usually those installed over 50 years ago may have less ground cover.

4. If surface levels are to be decreased / increased significantly the effects on existing water supply apparatus will be carefully considered and if any alterations are necessary, the costs of the alterations will be recharged to you in full. Outlets on fire hydrants must be no more than 300mm below the new levels and all surface boxes must be adjusted as part of the scheme.

5. To enable future repair works to be carried out without hindrance; any pipe, cable, duct, etc. installed parallel to a water main or service pipe should not be installed directly over or within 300mm of a water main or service pipe or 1000mm of a waste water asset. Where a pipe, cable, duct, etc. crosses a main or service it should preferably cross perpendicular or at an angle of no less than 45° and with a minimum clearance of 150mm. These requirements apply to activities within an existing highway and are relevant to the installation of pipes, cables, ducts, etc. up to and including 250mm in diameter *(see illustration below).* Necessary protection measures for installations greater than 250mm in diameter and/or in private land will need to be agreed on an individual basis. Installations within a new development site must comply with the National Joint Utilities Group publication Volume 2: NJUG Guidelines On The Positioning Of Underground Utilities Apparatus For New Development Sites.

6. All excavation works near to YW apparatus should be by hand digging only.

7. Backfilling with a suitable material to a minimum 300mm above YW apparatus is required.

8. Adequate support must be provided where any works pass under YW apparatus.

9. Jointing chambers, lighting columns and other structures must be installed in such a way that future repair or maintenance works to YW apparatus will not be hindered.

10. Apparatus such as; railings, sign posts, etc. must not be placed in such a way that they prevent access to or full operation of controlling valves, hydrants or similar apparatus. YWS surface boxes must not be covered or buried. Any adjustment, alteration or replacement of manhole covers must be agreed on site prior to the commencement of the works with a YWS Inspector who may be contacted via our Call Centre on 0845 124 24 24.

11. Explosives shall not be used within 100 metres of any Yorkshire Water Services apparatus or installations.

12. Vibrating plant should not be used directly over any apparatus. Movement or operation by vehicles or heavy plant is not to be permitted in the immediate vicinity of YWS plant or apparatus unless there has been prior consultation and, if necessary, adequate protection provided without cost to YWS.

13. ***Under no circumstances*** should thrust boring or similar trenchless techniques commence until the actual position of the Company's mains/services along the proposed route have been confirmed by trial holes.

14. Any alterations to the highway should be notified following the procedures outlined in the New Road and Street Works Act 1991 Code of Practice; Measures Necessary Where Apparatus Is Affected By Major Works (Diversionary Works).

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Western House, Halifax Road, Bradford BD6 2SZ. Registered in England and Wales No. 2366682

SafeMove
A part of YorkshireWater

15. You will be held responsible for any damage or loss to YWS apparatus during and after completion of work, caused by yourselves, your servant or agent. Any damage caused or observed to YWS plant or apparatus should be immediately reported to YWS. Should YW incur any costs as a result of non-compliance with the above, all costs will be rechargeable in full.

16. You should ensure that nothing is done on the site to prejudice the safety or operation of YWS employees, plant or apparatus.

17. In accordance with the New Roads and Street Works Act 1991, Chapter 22, Part 3, Section 80. The location of any identified YW asset "*which is not marked, or is wrongly marked, on the records made available* " should be communicated back to Yorkshire Water. The location of the apparatus should be identified on copies of the supplied plans which should be returned to Yorkshire Water (Asset Records Team) with photographic supporting evidence where possible.

18. The Government has decided that responsibility for private sewers serving two or more properties and lateral drains (the section of pipe beyond the boundary of a single property, connecting it to the public sewer) will be transferred to the water companies on Oct 1 2011. Private pumping stations will also transfer during the period 1 October 2011 – 1 Oct 2016. Records of these assets may not yet be shown on the existing mains record drawing(s). If you encounter any of these assets you must inform Yorkshire Water Services Ltd (YWS).

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20. This information is for guidance only and the position and depth of any YW apparatus is approximate only. Likewise, the nature and condition of any YW apparatus cannot be guaranteed. YW has no responsibility for recording the locations of privately owned apparatus. As of 1 October 2011, there may be some lateral drains and/or public sewers which are not documented on YW records but may still be present. For the avoidance of doubt, this information is not a substitute for appropriate professional and/or legal advice. YW accepts no responsibility for any inaccuracy or omissions in this information. The actual position of YW apparatus must be determined on site by excavating trail holes by hand. YW requires a minimum of two working days' written notice of the intention to excavate any trial holes before any excavation can be undertaken. If there are any queries in this respect please contact Yorkshire Water on 0345 124 24 24.

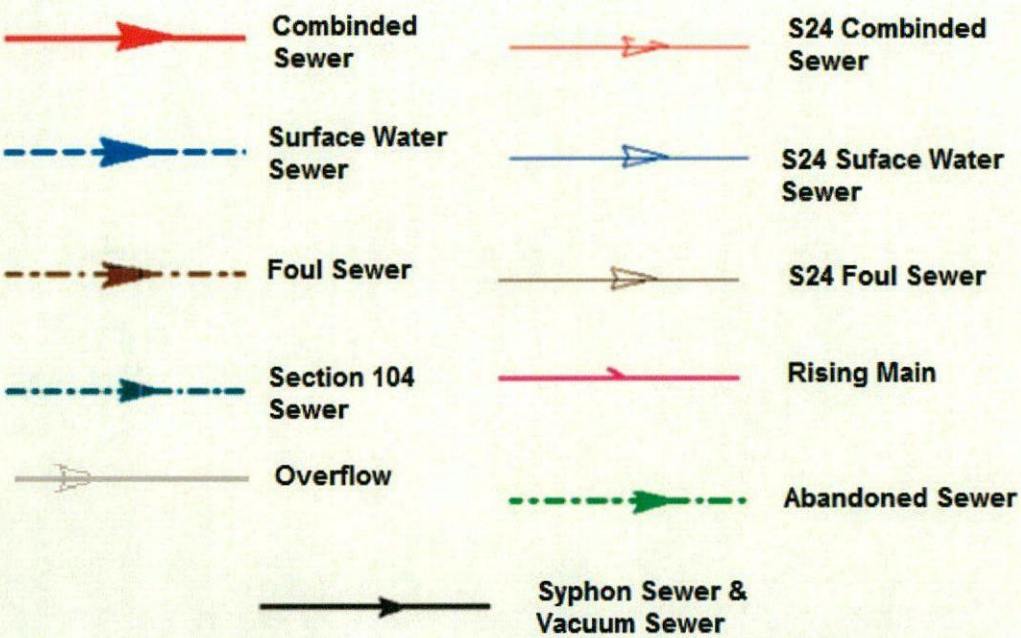
Registered Office, Yorkshire Water Services Limited.
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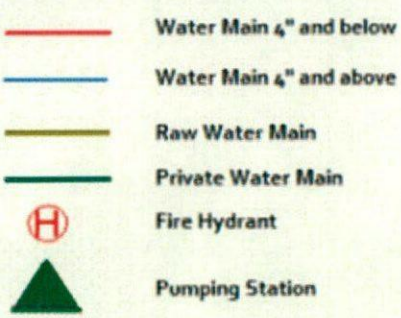
Property Indentfier



Sewer Legend



Water Legend

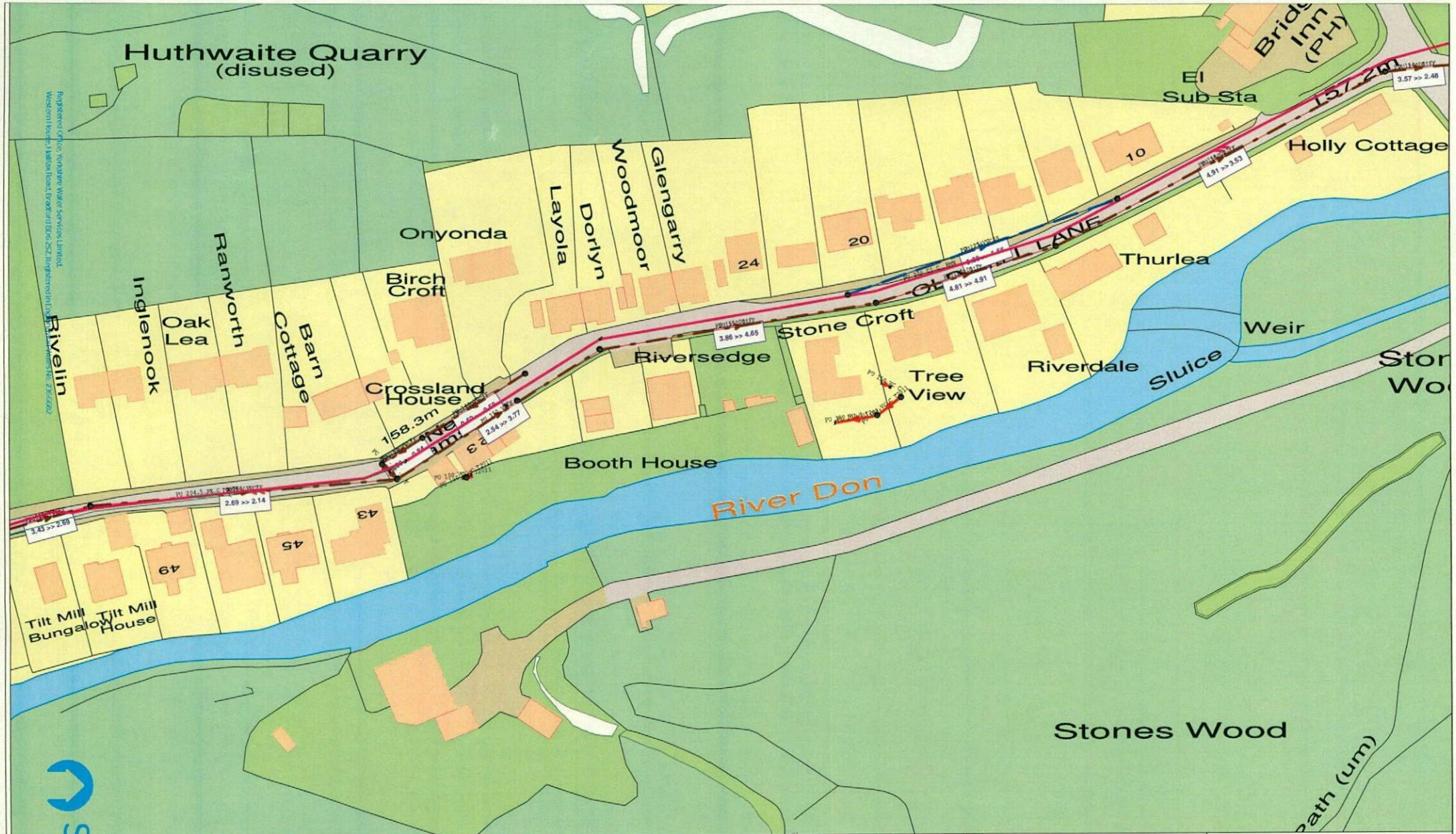


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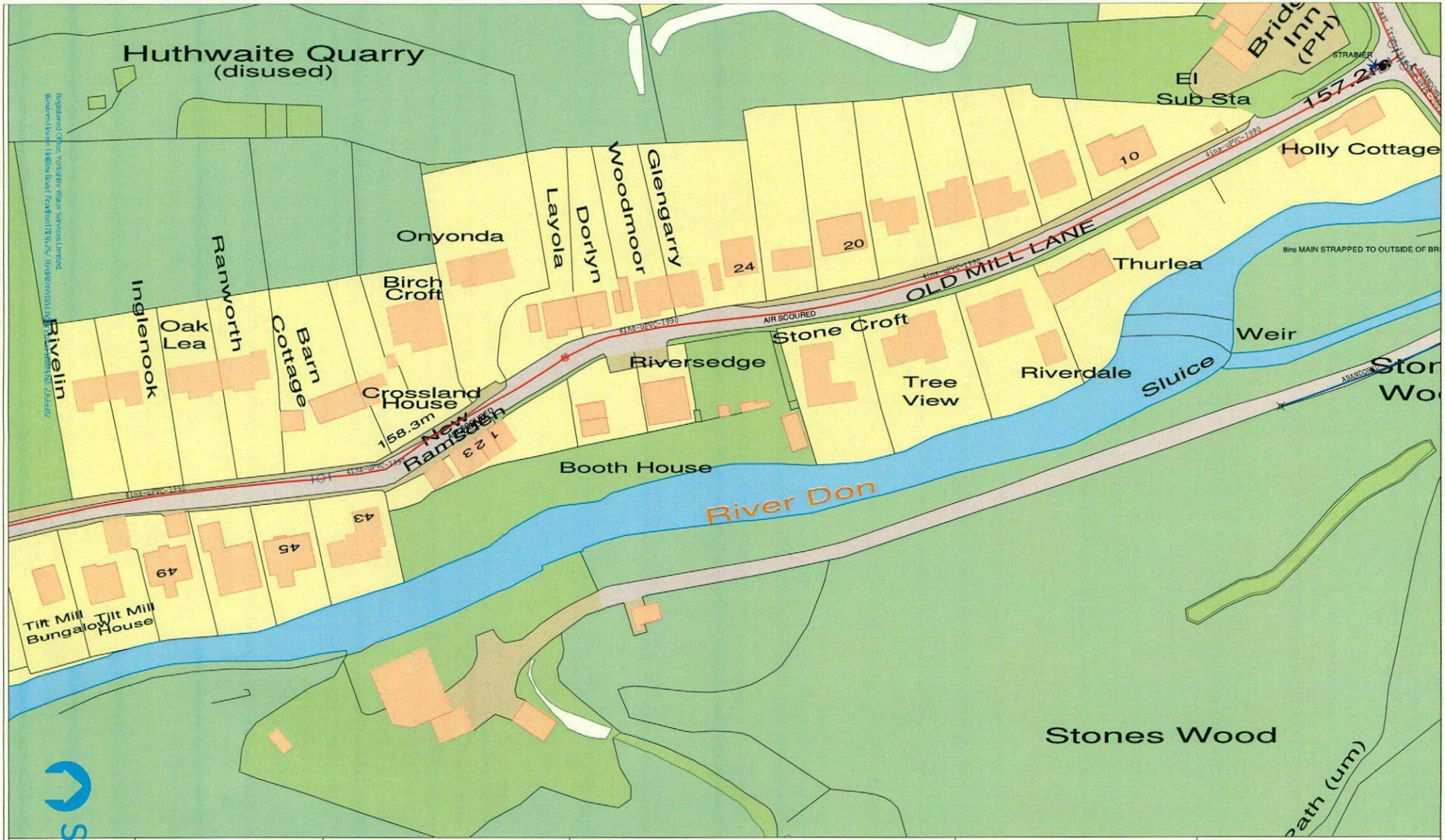
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428838 : 399870	Map Name : SK2899NE	Title	Partial Key Foul Sewer = F Combined Sewer = C Surface Water Sewer = SW Trade Sewer = TD Partially Separate = PS
YorkshireWater Yorkshire Water, PO Box 500, Halifax Road, Bradford BD6 2LZ Contact Name : S Edon Contact Tel :		Notes	This plan is furnished as a general guide only and no warranty as to its correctness is given or implied. This plan must not be relied upon in the event of excavations or other works made in the vicinity of public sewers. No house or property connections are shown.
		(Ody) COPYRIGHT STATEMENTS: Reproduced by permission of Ordnance Survey on behalf of HMSO © Crown copyright and database 2014. All rights reserved Ordnance Survey Licence number 100022432	Date Req : 28/02/2018, 09:40:27 Source : Sewer Network Enquiry
			Date Gen : 28/02/2018, 09:40:28

UPN: Undefined Originator: S Edon, ,



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428838 : 399870	Map Name : SK2899NE	Title	Partial Key Water mains up to 4" in diameter Water mains over 4" in diameter Raw water mains Private water mains
YorkshireWater Yorkshire Water, PO Box 500, Halifax Road, Bradford BD6 2LZ Contact Name : S Edon Contact Tel :		Notes	The position and depths of apparatus shown on this plan are approximate only. The exact positions and depths should be obtained by excavation trial holes. Scale : 1:1250
		(Ody) COPYRIGHT STATEMENTS: Reproduced by permission of Ordnance Survey on behalf of HMSO © Crown copyright and database 2014. All rights reserved Ordnance Survey Licence number 100022432	Drg No : Maris No : Date Req : 28/02/2018, 09:40:50 Date Gen : 28/02/2018, 09:40:51 Source : Water Network Enquiry

UPN: Undefined Originator: S Edon, ,

Appendix 4 – Environment Agency Correspondence

Daniel Alstead

From: Harris, Amanda <Amanda.Harris@environment-agency.gov.uk>
Sent: 23 February 2018 08:05
To: Daniel Alstead
Subject: Your Enquiry: RFI/2018/74440
Attachments: Planning advice for developers.pdf; 2007 Flood History 74440.pdf; Asset Location Map 74440.pdf; Flood History 74440.pdf; Flood Map for Planning 74440.pdf; Modelled Measurements 74440.pdf; Node Point Map 74440.pdf; pre-2007 Flood History 74440.pdf; Supporting Information 74440.pdf

Our Ref: RFI/2018/74440

Your Ref: SHF.1514.001 - Old Mill Lane, Thurgoland

Dear Daniel

Provision of FRA data for the above site

Thank you for your request of 24 January 2018 to use Environment Agency data. Please see the attached data and 'Supporting Information' document. I apologise for the slight delay in responding to this query.

Some of your enquiry seems to address pre-planning advice and has therefore been passed to our Sustainable Places team (reference is RA/2018/138212/01) and they will contact you separately if they have not already done so.

This information is provided subject to the Open Government Licence (here). Please read for details of permitted use.

If you are using our data to inform a development proposal, we encourage you to contact our Sustainable Places team for pre-application advice. Their advice can help you solve key environmental issues early, reduce the chance of an objection and help you design a more sustainable development. To take advantage of this service and gain further details, together with estimated costs, please email sp-yorkshire@environment-agency.gov.uk.

For general enquiries relating to your development or our role within the planning system, please refer to the attached 'Planning advice for developers' document.

We would be really grateful if you could spare five minutes to help us improve our service. Please click on the link below and fill in our survey – we use every piece of feedback we receive:

http://www.smartsurvey.co.uk/s/EnvironmentAgencyCustomerSurvey/?a=Y

Yours sincerely

Manda

Amanda Harris
Customers and Engagement Team
✉ **Environment Agency, Lateral, 8 City Walk, Leeds. LS11 9AT**
☎ **General Enquiries Team 020 847 48174**
☎ **Direct 020 847 47926** ***(internal 47926)***
neyorkshire@environment-agency.gov.uk

Daniel Alstead

From: Harris, Amanda <Amanda.Harris@environment-agency.gov.uk>
Sent: 23 February 2018 08:21
To: Daniel Alstead
Subject: Your Enquiry: RFI/2018/74440
Attachments: dps1.pdf

Our Ref: RFI/2018/74440

Your Ref: 180129/AB02 - FRA Enquiry - Old Mill Lane, Thurgoland

Dear Daniel

RE: Above enquiry
Request for information under the Freedom of Information Act 2000 (FOIA) / Environmental Information Regulations 2004 (EIR)

Further to my previous email of this morning. I have now found information provided by our Sustainable Places Team which I now attach.

I hope that we have correctly interpreted your request. Please see the Open Government Licence (here) for details of permitted use.

We respond to requests for recorded information that we hold under the Freedom of Information Act 2000 (FOIA) and the associated Environmental Information Regulations 2004 (EIR).

If you are not satisfied with our response to your request for information you can contact us within 2 calendar months to ask for our decision to be reviewed.

We would be really grateful if you could spare five minutes to help us improve our service. Please click on the link below and fill in our survey – we use every piece of feedback we receive:

http://www.smartsurvey.co.uk/s/EnvironmentAgencyCustomerSurvey/?a=Y

If you require any further help, please do not hesitate to contact me.

Yours sincerely

Manda

Amanda Harris
Customers and Engagement Team
✉ **Environment Agency, Lateral, 8 City Walk, Leeds. LS11 9AT**
☎ **General Enquiries Team 020 847 48174**
☎ **Direct 020 847 47926** ***(internal 47926)***
neyorkshire@environment-agency.gov.uk

RFI

Ref:	*74440*	Completed by:	*Chris Engleman*	Date due:	*21.02.18*

The Flood Map for Planning

The Environment Agency provides the Flood Map (see enclosed extract).

What is the Flood Map for Planning?

The Flood Map for Planning provides information on flooding from rivers and the sea for England and Wales. The Flood Map also has information on flood defences and the areas benefiting from those flood defences.

The Flood Map for Planning shows the following:

1. Flood Zone 3 (dark blue area on the enclosed map): natural flood plain area that could be affected by flooding from rivers and/or the sea – not taking into account the presence of any flood defences
   - For flooding from rivers the map indicates the extent of a flood with a 1% (1 in 100) chance of happening each year;
   - For flooding from the sea the map shows the extent of a flood with a 0.5% (1 in 200) chance of happening each year.

2. Flood Zone 2 (light blue area): natural flood plain area that could be affected by flooding from rivers and/or the sea – not taking into account the presence of any flood defences. Flood Zone 2:
   - indicates the extent of a flood with a 0.1% (1 in 1000) chance of happening each year.
   - and/or indicates the greatest recorded historic flood, whichever is greater.

3. Flood defences built in the last five years to protect against river floods with a 1% (1 in 100) chance of happening each year, together with some natural or constructed entities which retain, store or channel water and which may protect against smaller floods.

4. Areas benefiting from flood defences - areas that benefit from the flood defences shown, in the event of a river flood with a 1% (1 in 100) chance of happening each year, or a flood from the sea with a 0.5% (1 in 200) chance of happening each year. If the defences were not there, these areas would flood.

Flood History

Flood History

See the attached map showing the flood history for this site. The extent of flooding, and/or flood level information is only shown for those watercourses surveyed after the flood. Other flooding may have occurred which is not shown. This is the best information currently available.

Please refer to the following table detailing the causes of those past floods.

Name	Comments	Start Date	End Date	Source Of Boundary	Source Of Flooding	Cause Of Flooding
123 Autumn 2000	River Don. Woodman Farm	07/11/2000	04/12/2000	Main River	Unknown	Aerial Photograph
123 Autumn 2000	River Don. Huthwaite Bank	07/11/2000	04/12/2000	Main River	Unknown	Aerial Photograph
2007 River Don Thurgoland	River Don at Thurgoland	15/06/2007	30/06/2007	Main River	Channel Capacity Exceeded	Local Authority

Flood History
To the best of our knowledge there is no known flood history for this site. However, in close proximity to this location we do have some flood history available (see enclosed map). The extent of flooding, and/or flood level information is only shown for those watercourses surveyed after the flood. Other flooding may have occurred which is not shown. This is the best information currently available.

Flood History – None available
To the best of our knowledge there is no known flood history for this site. The extent of flooding, and/or flood level information is only shown for those watercourses surveyed after the flood. Other flooding may have occurred which is not shown. This is the best information currently available. For local drainage information please contact your water utility company and your local council.

Currently the Environment Agency can only supply flood risk data relating to the risk of flooding from rivers or the sea. However you should be aware that in recent years, there has been an increase in flood damage caused by surface water flooding or drainage systems that have been overwhelmed. Local Authorities and/or Water Companies may be able to provide some knowledge on the risk of flooding from sources other than rivers and the sea and we are working with these organisations to improve knowledge and understanding of surface water flooding.

Assets

Asset Location Map
Please find attached asset map(s) showing location of all (Agency and non Agency maintained) flood defences and channels.

Description of Works
See attached table with description of the defences and structures shown on the above drawing, including condition ratings, upstream and downstream crest levels, where available.

Risk of Flooding – Environment Agency Defences
The risk of flooding in this area is now reduced by the presence of flood defences that we maintain, but there still is a residual risk of flooding if these were to breach or be overtopped by a flood greater than that for which they were designed.

Risk of Flooding – Privately Maintained Defences
You will see that the Environment Agency does not maintain any of those defences. However we undertake regular risk based visual inspections. We do not hold design levels and have no height information on these defences or structures.

Asset Condition Ratings
The performance of a flood defence asset is recorded as the condition of the asset. Our asset inspectors subjectively assess the conditions of assets (during visual inspection site visits) with reference to a national standard template. Each asset is given a rating between one and five with one being very good condition and five being very poor. A condition rating of 3, or 'fair' is the minimal acceptable standard for a critical asset, such as a defence wall that protects properties. We are striving to improve all assets below 'fair' to an acceptable standard.

Asset inspections are done on average every six months, although some critical assets are assessed on a more regular basis. It is possible that adjacent assets are inspected on different dates, which may result in two assets of a similar state of repair having different condition ratings.

Condition ratings of assets may also be affected by the time of year the surveys are conducted, as vegetation may obscure the asset in the summer months, or accessibility may be an issue during winter months. These factors would not usually affect the recorded condition rating of an asset unless the asset is on a borderline between two ratings.

Asset Standard of Protection
Please note that the provided Design Standard of Protection is an estimate and should not be relied on. Please note that where available the defended flood extents provide more reliable information relating to the protection offered by the defence (i.e. at which return period the water levels are likely to overtop the defence). If available and required the defended flood extents can be provided on request.

Modelling

2012 Sheffield Comprehensive Flood Review Model
Undefended modelled flood levels are available.

Please see enclosed:

- Table of results for peak water levels for the 0.1% (1 in 1000yr), 0.5% (1 in 200yr) 1% (1 in 100yr), 1.3% (1 in 75yr), 2% (1 in 50yr), 4% (1 in 25yr);
- and a map showing the location of the model node points;

Please note that the climate change scenario for this model is note available.

Lower Don Valley FAS Post Scheme Modelling is expected to be available in April 2018.

Please note that the defended levels have not been verified and may change following an update.

Climate Change

Please note that new guidance on climate change allowances for Flood Risk Assessments has been published in February 2016.
The new guidelines are available from:
https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances

Bespoke Flood Risk Assessment (FRA) advice:

If the pre-application advice is required with regards the preparation of a site-specific Flood Risk Assessment, this can be requested via the Yorkshire Sustainable Places team (email: sp-yorkshire@environment-agency.gov.uk). Charges may apply for any advice that is provided, this currently stands at £84 per hour per person. The .gov.uk pages provide a good starting point on what to include within a site-specific Flood Risk Assessment and can be accessed via https://www.gov.uk/guidance/flood-risk-assessment-for-planning-applications. A site-specific Flood Risk Assessment will need to consider flood risks from all sources, including those associated with defence failure (e.g. breach) and accounting for the predicted impacts as a result of climate change. Please contact the Sustainable Places team if you require advice on how to include these within a Flood Risk Assessment.

Surface Water Map

In partnership with Local Authorities, we publish Risk of flooding from surface water maps. These were updated in December 2013. If you would like a copy of the map for your area, please contact us again.

Risk of Flooding from Reservoirs Map

Outlines and simplified depth and velocity maps can be viewed on our website:
http://watermaps.environment-agency.gov.uk/wiyby/wiyby.aspx?topic=reservoir&scale=1&textonly=off&ep=map&layerGroups=default&lang=_e&y=355134&x=357683#x=438988&y=406600&scale=2

Please, zoom into the location of interest, and then click on the inundated location for details. As a result a list of reservoirs will be provided with supporting information and a links to other data, such as estimated depths and speed of flooding, at the bottom of the result page.

A map of showing the outlines can also be provided on request.

Flood Warning

The site is covered by a Flood Warning. To register to receive this service, you can call Floodline 24 hours a day on 0845 988 1188.

LIDAR Data

Please note that our LiDAR data is now available free of charge (Open Data) from http://environment.data.gov.uk/ds/survey/index.jsp#/survey (once zoomed to the relevant location the available LiDAR products will be listed below the map).

Two LIDAR products are available:

1. Tiled LIDAR data - The full tiled dataset consists of historic LIDAR data which has been gathered since 1998. For some areas we have carried out repeat surveys and data is available in a range of resolutions.
2. Composite LIDAR data - The composite dataset is derived from a combination of our full tiled dataset which has been merged and re-sampled to give the best possible spatial coverage.

Light Detection and Ranging (LIDAR) is an airborne mapping technique, which uses a laser to measure the distance between the aircraft and the ground. This technique results in the production of an accurate, cost-effective terrain model suitable for assessing flood risk and other environmental applications.

The Environment Agency owns two LIDAR systems, which are installed in a survey aircraft along with its other operational remote sensing instruments.

The aircraft is positioned and navigated using Global Positioning System (GPS) corrected to known ground reference points. The aircraft typically flies at a height of about 800 metres above ground level and a scanning mirror allows a swath width of about 600 metres to be surveyed during a flight.

The Rights & Responsibilities of a Riverside Owner

The owner of property adjacent to a watercourse is usually deemed to be the riparian owner and, as such, has both riparian rights and responsibilities with regard to the watercourse within their ownership.

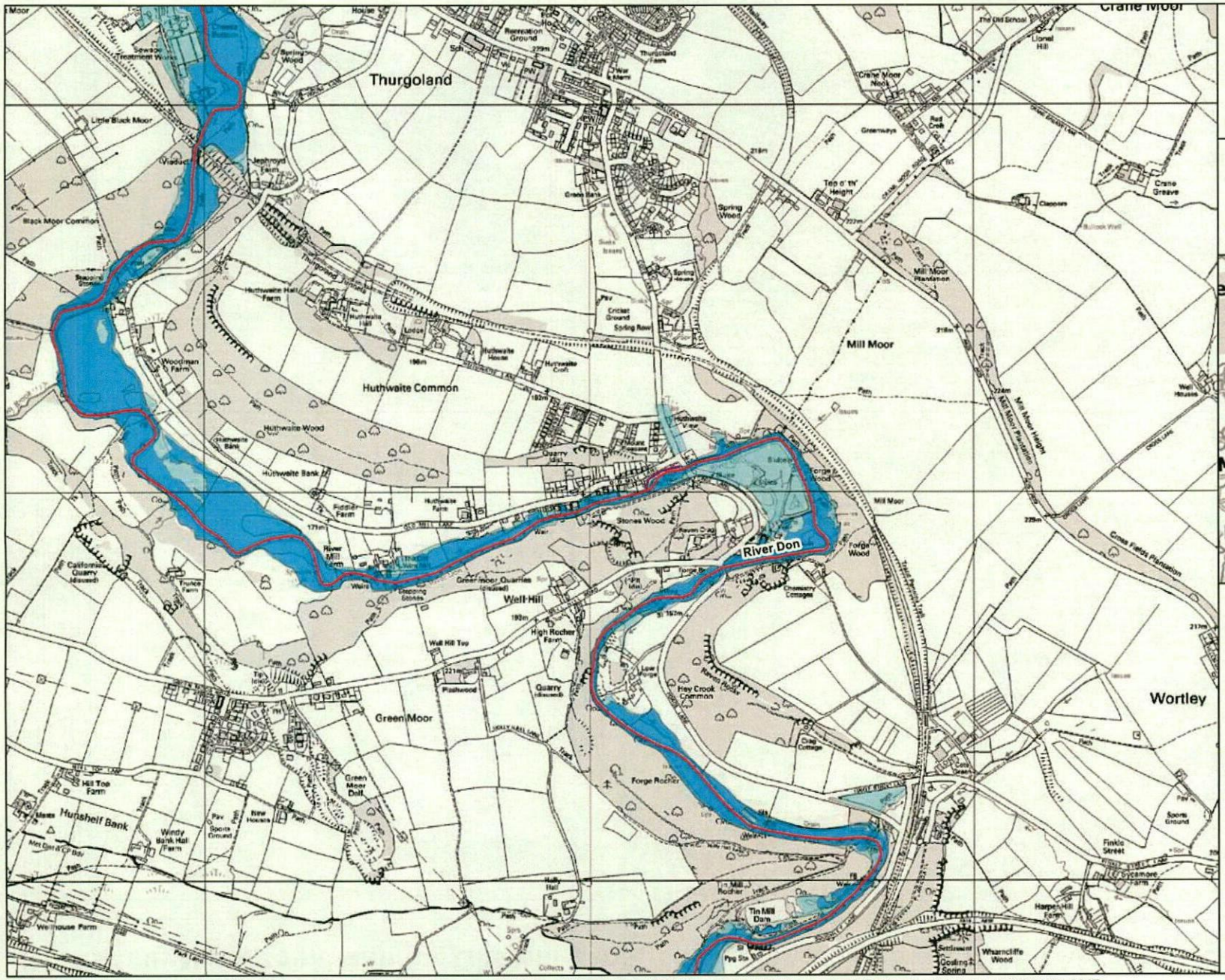
The responsibility for general maintenance and repair of the watercourse and its banks rests with the riparian owner. For more information on Rights and Responsibilities of a riverside owner, you can visit our website at: https://www.gov.uk/government/organisations/environment-agency go to the Flooding and coastal change section and click on 'Riverside ownership: rights and responsibilities ('living on the edge') under the River maintenance section and download the 'Living on the Edge' booklet.

Alternatively type the following address into your web browser:
https://www.gov.uk/government/publications/riverside-ownership-rights-and-responsibilities

Ordnance Survey Data
Under the terms of our licence agreement with the Ordnance Survey, we are unable to supply the OS data. Under this agreement we can only supply OS data to consultants/contractors carrying out work on our behalf.

Flood Portal
It's a new 'one-stop shop' web portal providing guidance and information on flood risk management in the UK. Arup have written and designed the site, in conjunction with CIRIA, the Local Government Association, the EA and Defra, primarily as a resource for local authority officers, flood risk management professionals, and others with an interest in flood risk. It's a part of the Capacity Building Strategy.
http://www.local.gov.uk/floodportal

RFI: 74440 Flood Map for Planning for Old Mill Lane, Thurgoland, Sheffield, S35 7AG Date Created: 08/02/18



Environment Agency

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Scale: 1:10,000

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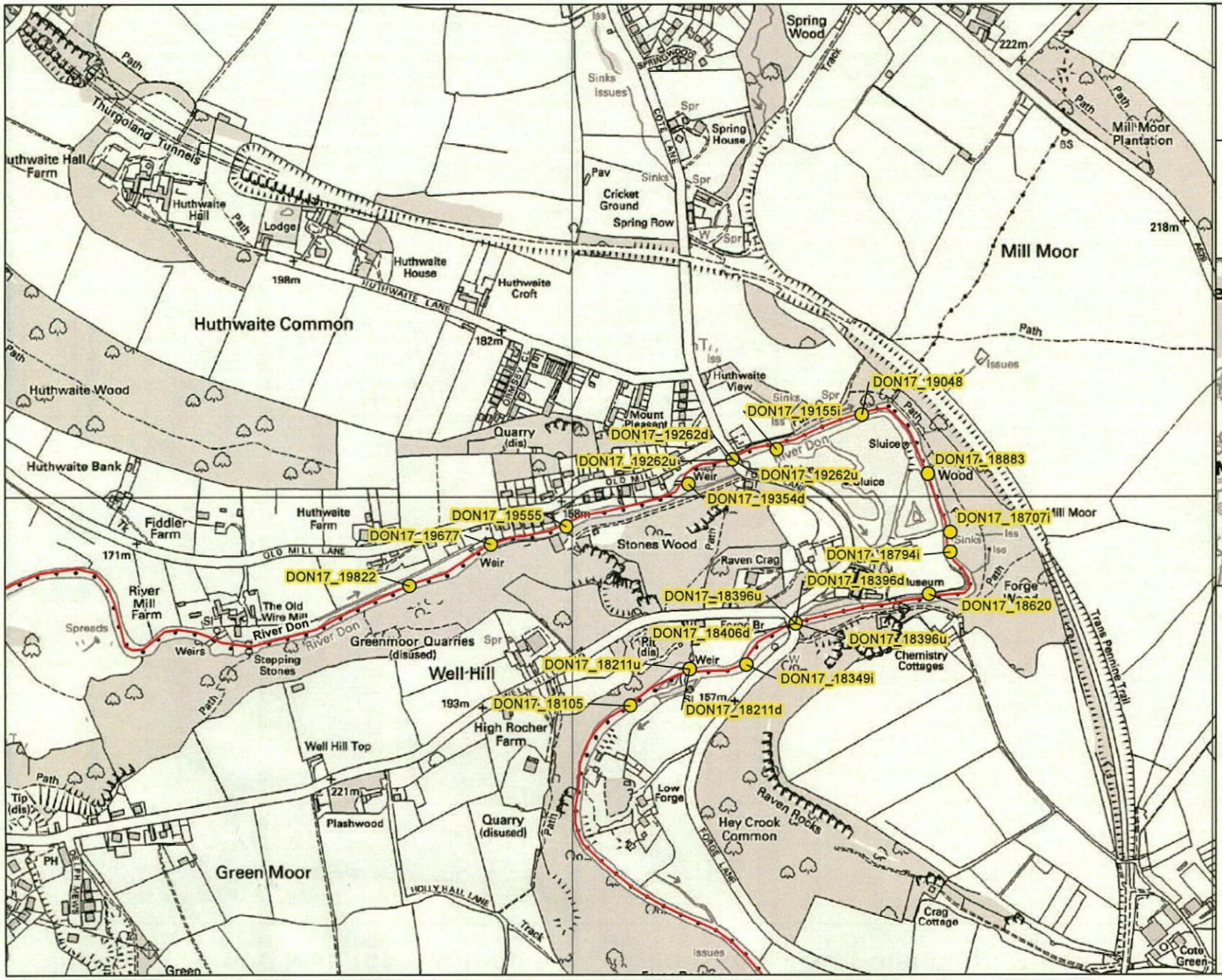
LEGEND

- Main River
- Flood Map Flood Defences
- Areas Benefitting From Flood Defences
- Flood Storage Areas
- Flood Zone 3 (FZ3)
- Flood Zone 2 (FZ2)

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RFI 74440: NodePoint Map for Old Mill Lane, Thurgoland, Sheffield, S35 7AG Date Created: 08/02/18



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LEGEND

Main River

Model Nodes

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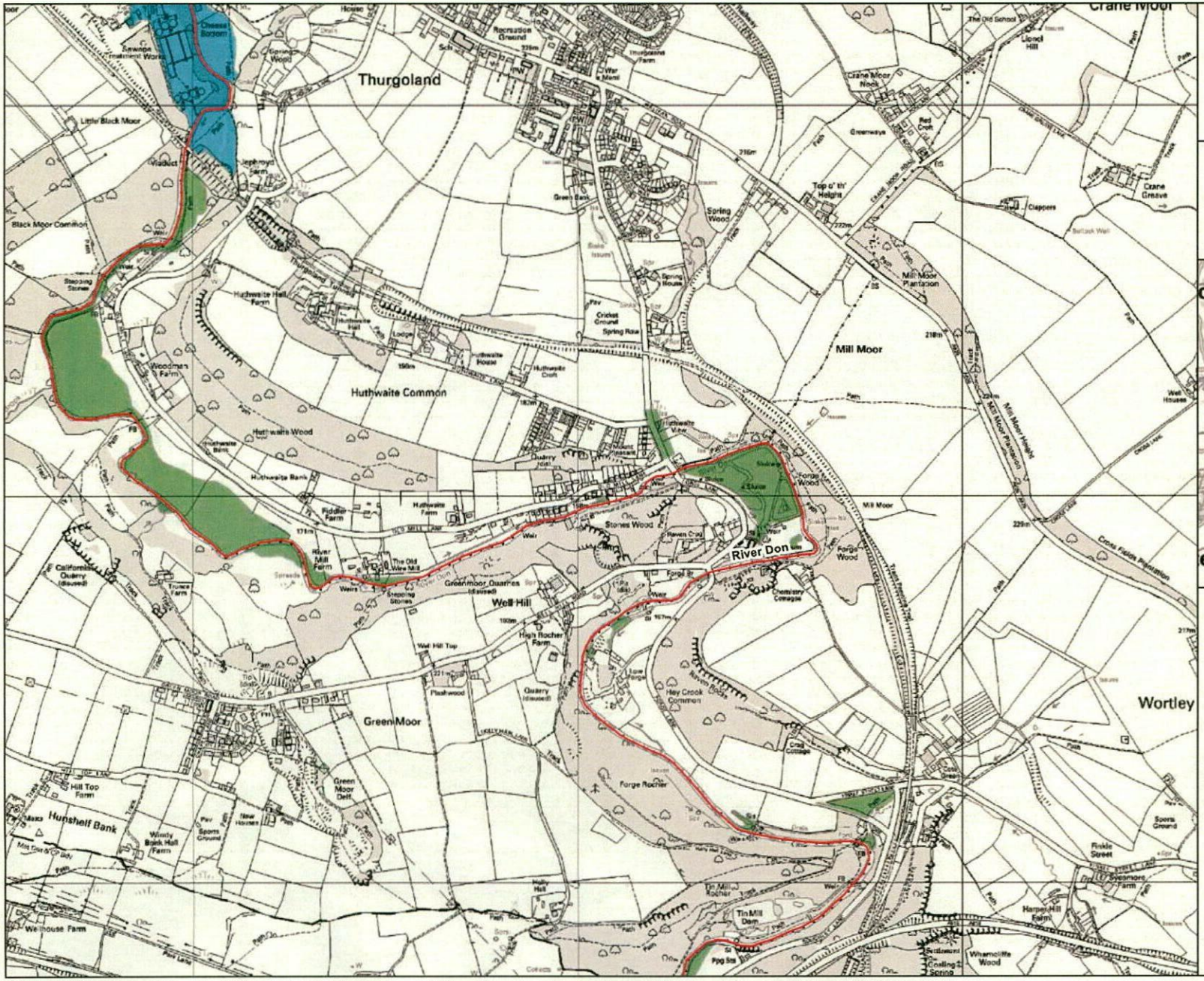
Contact Us: National Customer Contact Centre, PO Box 544, Rotherham, S60 1BY. Tel: 08708 506 506 (Mon-Fri 8-6). Email: enquiries@environment-agency.gov.uk

Modelled Measurements for 2012 Sheffield CFR Model - RFI 74440 (Level - mAOD, Max flows - m3/s)

		Undefended Scenario											
Model Node	Bed Level (m AOD)	1:25yr		1:50yr		1:75yr		1:100yr		1:200yr		1:1000yr	
		Level	Flow	Level	Flow	Level	Flow	Level	Flow	Level	Flow	Level	Flow
DON17_19822	154.25	156.957	47.912	157.156	56.82	157.252	61.49	157.32	65.023	157.558	78.275	158.158	119.045
DON17_19677	153.57	156.23	47.911	156.407	56.818	156.493	61.487	156.555	65.02	156.776	78.274	157.402	119.04
DON17_19555	153.15	155.687	47.913	155.833	56.815	155.904	61.488	155.954	65.021	156.133	78.271	156.793	119.031
DON17_19354u	153.44	154.894	47.911	154.996	56.813	155.046	61.489	155.083	65.025	155.215	78.282	156.235	119.033
DON17_19354u	153.44	154.894	47.911	154.996	56.813	155.046	61.489	155.083	65.025	155.215	78.282	156.235	119.033
DON17_19354d	151.63	154.002	47.911	154.322	56.813	154.474	61.489	154.589	65.025	154.984	78.282	156.169	119.033
DON17_19262u	150.87	153.809	47.914	154.117	56.809	154.266	61.49	154.377	65.02	154.772	78.277	155.97	119.027
DON17_19262u	150.87	153.809	47.914	154.117	56.809	154.266	61.49	154.377	65.02	154.772	78.277	155.97	119.027
DON17_19262d	150.87	153.694	47.914	153.954	56.809	154.075	61.49	154.164	65.02	154.469	78.277	155.128	119.027
DON17_19155i	150.3	153.346	47.911	153.595	56.814	153.708	61.487	153.791	65.023	154.073	78.277	154.695	119.029
DON17_19048	149.73	152.895	47.916	153.109	56.808	153.207	61.489	153.278	65.021	153.516	78.276	154.139	119.023
DON17_18883	149.19	152.314	47.916	152.491	56.807	152.574	61.491	152.635	65.019	152.834	78.273	153.339	119.021
DON17_18794i	149.15	152.093	47.913	152.267	56.805	152.347	61.485	152.405	65.024	152.601	78.273	153.101	119.019
DON17_18707i	149.1	151.855	47.917	152.028	56.796	152.108	61.489	152.167	65.023	152.359	78.275	152.898	118.999
DON17_18620	149.05	151.494	47.912	151.694	56.799	151.789	61.478	151.857	65.023	152.079	78.269	152.714	118.991
DON17_18406u	148.33	150.505	47.91	150.714	56.784	150.821	61.475	150.9	65.008	151.18	78.262	152.024	118.961
DON17_18406u	148.33	150.505	47.91	150.714	56.784	150.821	61.475	150.9	65.008	151.18	78.262	152.024	118.961
DON17_18406d	148.33	150.441	47.91	150.614	56.784	150.699	61.475	150.761	65.008	150.971	78.262	151.49	118.961
DON17_18396u	148.33	150.381	47.908	150.55	56.783	150.632	61.476	150.693	65.011	150.897	78.262	151.399	118.96
DON17_18396u	148.33	150.381	47.908	150.55	56.783	150.632	61.476	150.693	65.011	150.897	78.262	151.399	118.96
DON17_18396d	148	150.288	47.908	150.442	56.783	150.517	61.476	150.573	65.011	150.755	78.262	151.191	118.96
DON17_18349i	147.78	150.111	47.91	150.245	56.786	150.312	61.475	150.362	65.009	150.526	78.261	150.927	118.964
DON17_18211u	147.15	149.375	47.909	149.506	56.783	149.57	61.475	149.617	65.006	149.775	78.261	150.151	118.961
DON17_18211u	147.15	149.375	47.909	149.506	56.783	149.57	61.475	149.617	65.006	149.775	78.261	150.151	118.961
DON17_18211d	146	148.389	47.909	148.587	56.783	148.694	61.475	148.78	65.006	149.238	78.261	149.733	118.961
DON17_18105	145.35	147.62	47.911	147.805	56.785	147.892	61.476	147.961	65.009	148.219	78.259	148.821	118.963

		Defended Scenario											
Model Node	Bed Level (m AOD)	1:25yr		1:50yr		1:75yr		1:100yr		1:200yr		1:1000yr	
		Level	Flow	Level	Flow	Level	Flow	Level	Flow	Level	Flow	Level	Flow
DON17_19822	154.25	156.957	47.912	157.156	56.809	157.252	61.52	157.32	65.021	157.557	78.222	158.157	119.031
DON17_19677	153.57	156.23	47.911	156.407	56.813	156.493	61.519	156.555	65.018	156.775	78.226	157.402	119.024
DON17_19555	153.15	155.687	47.913	155.833	56.808	155.904	61.523	155.954	65.02	156.132	78.218	156.793	119.02
DON17_19354u	153.44	154.894	47.911	154.996	56.813	155.046	61.519	155.083	65.022	155.215	78.21	156.234	119.016
DON17_19354u	153.44	154.894	47.911	154.996	56.813	155.046	61.519	155.083	65.022	155.215	78.21	156.234	119.016
DON17_19354d	151.63	154.002	47.911	154.322	56.813	154.475	61.519	154.589	65.022	154.982	78.21	156.168	119.016
DON17_19262u	150.87	153.809	47.914	154.117	56.811	154.267	61.518	154.377	65.022	154.77	78.21	155.969	119.015
DON17_19262u	150.87	153.809	47.914	154.117	56.811	154.267	61.518	154.377	65.022	154.77	78.21	155.969	119.015
DON17_19262d	150.87	153.694	47.914	153.954	56.811	154.076	61.518	154.164	65.022	154.467	78.21	155.127	119.015
DON17_19155i	150.3	153.346	47.911	153.595	56.809	153.709	61.514	153.791	65.019	154.072	78.205	154.695	119.015
DON17_19048	149.73	152.895	47.916	153.109	56.808	153.207	61.514	153.278	65.025	153.515	78.207	154.139	119.015
DON17_18883	149.19	152.314	47.916	152.491	56.805	152.575	61.514	152.635	65.02	152.834	78.207	153.339	119.012
DON17_18794i	149.15	152.093	47.913	152.267	56.801	152.347	61.512	152.405	65.017	152.6	78.212	153.101	119.005
DON17_18707i	149.1	151.855	47.917	152.028	56.799	152.108	61.511	152.166	65.026	152.358	78.206	152.898	118.993
DON17_18620	149.05	151.494	47.912	151.694	56.793	151.79	61.506	151.857	65.017	152.078	78.2	152.714	118.973
DON17_18406u	148.33	150.505	47.91	150.714	56.778	150.821	61.501	150.9	65.009	151.179	78.199	152.024	118.953
DON17_18406u	148.33	150.505	47.91	150.714	56.778	150.821	61.501	150.9	65.009	151.179	78.199	152.024	118.953
DON17_18406d	148.33	150.441	47.91	150.614	56.778	150.699	61.501	150.761	65.009	150.97	78.199	151.489	118.953
DON17_18396u	148.33	150.381	47.908	150.55	56.778	150.633	61.501	150.693	65.009	150.896	78.198	151.399	118.954
DON17_18396u	148.33	150.381	47.908	150.55	56.778	150.633	61.501	150.693	65.009	150.896	78.198	151.399	118.954
DON17_18396d	148	150.288	47.908	150.442	56.778	150.518	61.501	150.573	65.009	150.754	78.198	151.191	118.954
DON17_18349i	147.78	150.111	47.91	150.245	56.779	150.313	61.505	150.362	65.008	150.525	78.198	150.927	118.956
DON17_18211u	147.15	149.375	47.909	149.506	56.779	149.571	61.501	149.617	65.003	149.774	78.196	150.151	118.953
DON17_18211u	147.15	149.375	47.909	149.506	56.779	149.571	61.501	149.617	65.003	149.774	78.196	150.151	118.953
DON17_18211d	146	148.389	47.909	148.586	56.779	148.695	61.501	148.78	65.003	149.237	78.196	149.733	118.953
DON17_18105	145.35	147.62	47.911	147.805	56.78	147.892	61.504	147.961	65.003	148.218	78.198	148.821	118.95

Flood History Map for Old Mill Lane, Thurgoland, Sheffield, S35 7AG Date Created: 13.02.18 RFI: 74440

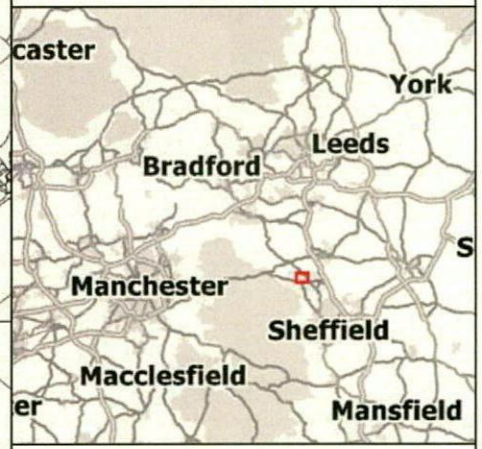


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Scale: 1:10,000

when reproduced @ A3



Historical Flood Extents and Levels

LEGEND

Main River

2007 Event Outlines

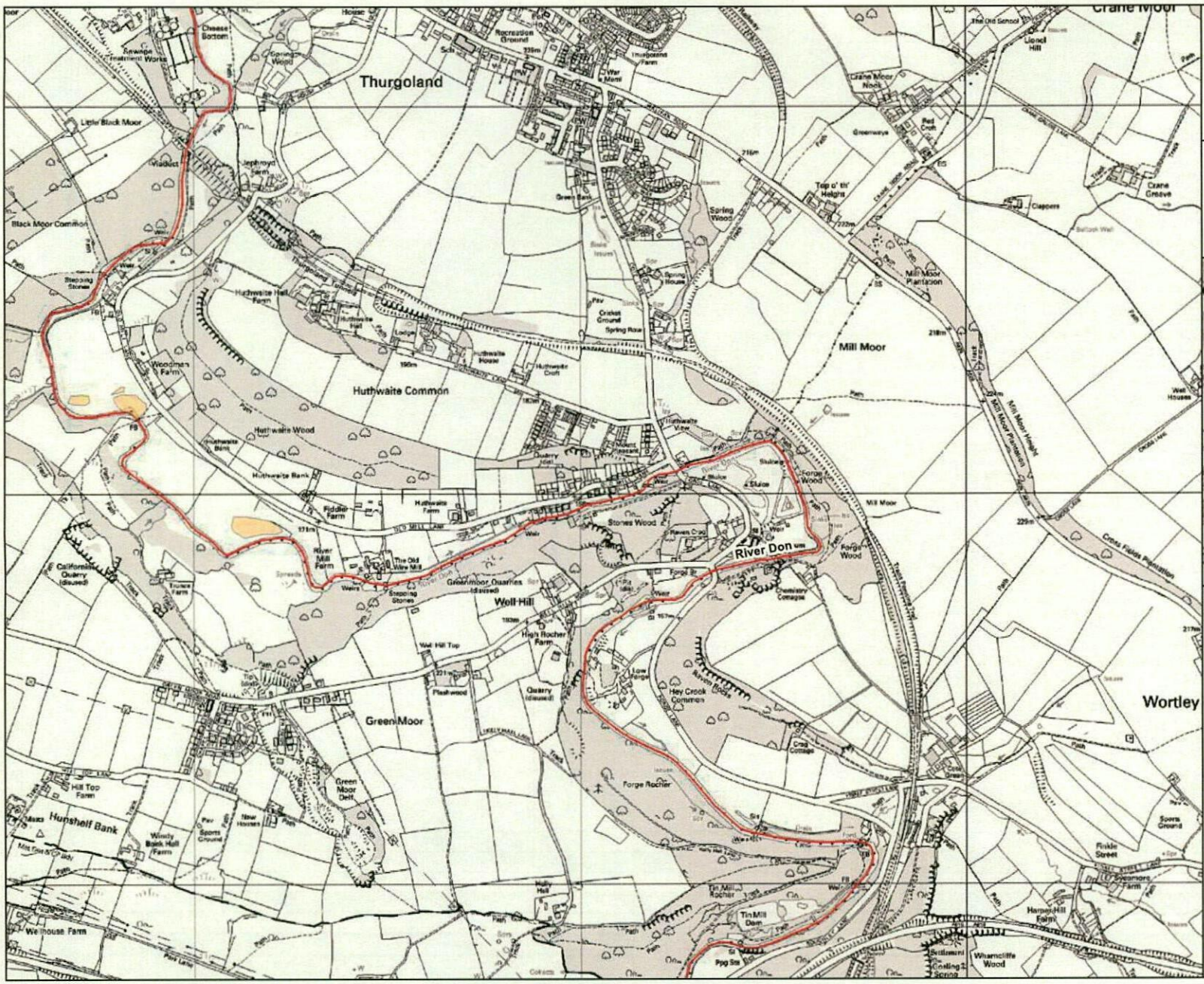
2007 River Don Huthwaite

2007 River Don Thurgoland

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Contact Us: National Customer Contact Centre, PO Box 544, Rotherham, S60 1BY. Tel: 08708 506 506 (Mon-Fri 8-6). Email: enquiries@environment-agency.gov.uk

Pre 2007 Flood History Map for Old Mill Lane, Thurgoland, Sheffield, S35 7AG Date Created: 13.02.18 RFI: 74440



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Historical Flood Extents and Levels

LEGEND

Main River

Historic Flood Outlines

123 Autumn 2000

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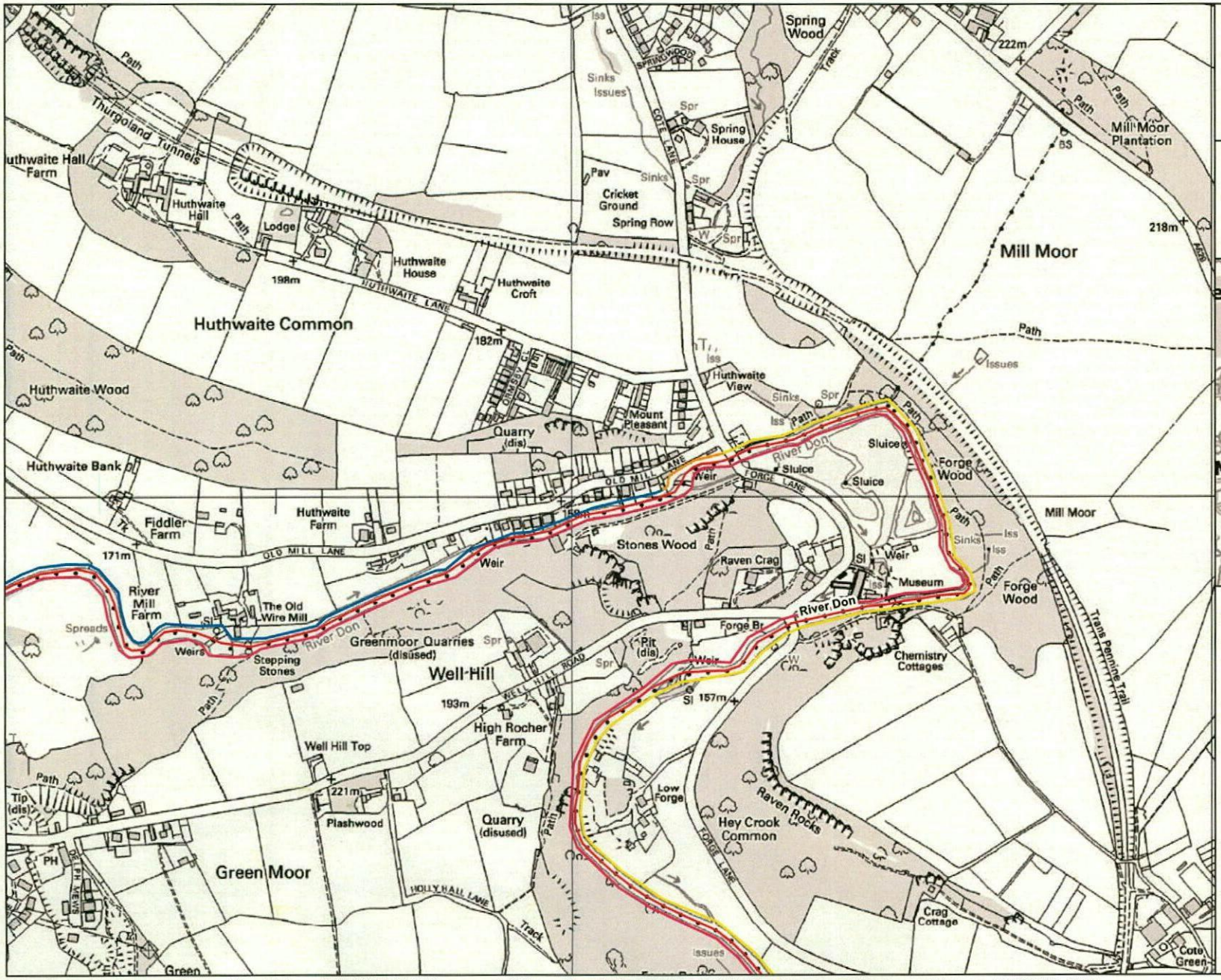
Contact Us: National Customer Contact Centre, PO Box 544, Rotherham, S60 1BY. Tel: 08708 506 506 (Mon-Fri 8-6). Email: enquiries@environment-agency.gov.uk

RFI 74440 Flood History Information

Name	Comments	Start Date	End Date	Flood Source	Flood Cause
123 Autumn 2000	River Don. Woodman Farm	07/11/2000	04/12/2000	Main River	Unknown
123 Autumn 2000	River Don. Huthwaite Bank	07/11/2000	04/12/2000	Main River	Unknown
2007 River Don Thurgoland	River Don at Thurgoland	15/06/2007	30/06/2007	Main River	Channel Capacity Exceeded

Data Source
Aerial Photograph
Aerial Photograph
Local Authority

RFI 74440: Asset Location Map for Old Mill Lane, Thurgoland, Sheffield, S35 7AG Date Created: 08/02/18



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Scale: 1:6,000

when reproduced @ A3



LEGEND

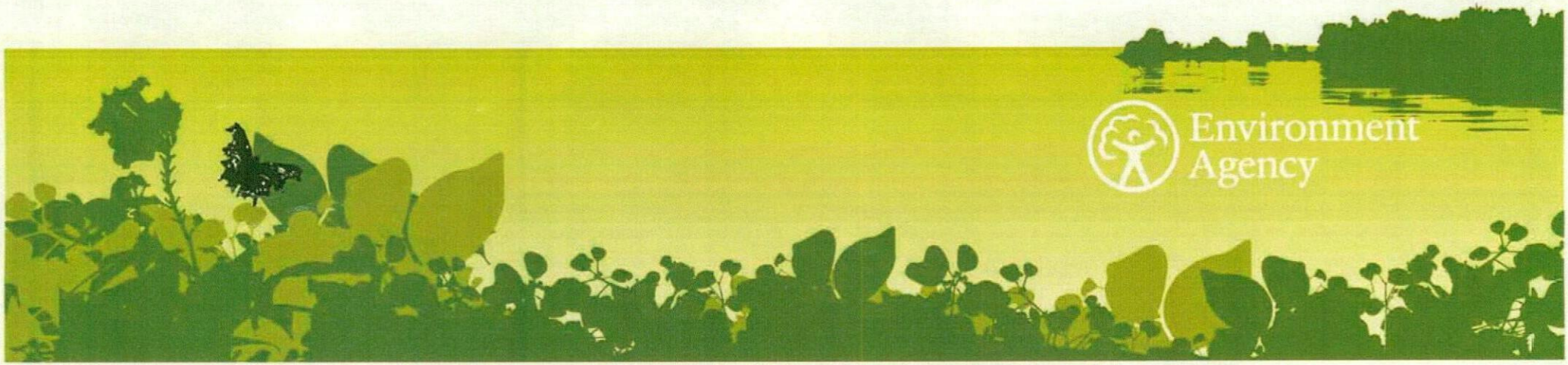
Main River

Defences

- 25777
- 50222
- 135320
- 170502

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Contact Us: National Customer Contact Centre, PO Box 544, Rotherham, S60 1BY. Tel: 08708 506 506 (Mon-Fri 8-6). Email: enquiries@environment-agency.gov.uk



Planning advice for developers – FAQs

Introduction

Local planning authorities (LPAs) across Yorkshire are required to consult us on certain planning applications which affect flood risk, groundwater, waste, or water quality.

If your development falls into one of these categories, we'll be invited to comment on your planning application. Your LPA, when considering your application, will take our comments into account.

We've produced this guidance to summarise the environmental issues we're responsible for. The guidance forms part of our free advice service; if you require site-specific or face-to-face advice, we'll need to recover our costs through our charged advice service. Engaging with us early can help you identify the big issues, reduce the chances of subsequent delays and help you design a more sustainable and attractive development.

Development and flood risk

Is my development proposal at risk of flooding?

The flood map for planning shows where flooding from rivers and the sea may occur. Whilst this map isn't suitable for a detailed flood risk assessment, it'll show which flood zone your development is located within and therefore will indicate whether further assessment is needed. You should also refer to your LPA's strategic flood risk assessment which will provide additional local information on flood risk, including the location of functional floodplain and areas which are susceptible to other sources of flooding such as from surface water or reservoirs.

Will my application need to pass the sequential and exception tests?

Local planning authorities apply the sequential test to steer development towards areas at the lowest risk of flooding. If your proposal is located within flood zones 2 or 3, you should contact your LPA to discuss the sequential test **before** submitting your application. The LPA may require you to submit information with your application in support of the sequential test.

If the LPA confirm that the sequential test has ruled out steering the development to lower risk sites, the development may also need to pass the exception test by demonstrating that its sustainability benefits outweigh flood risk and that it can be made safe for its lifetime, through the production of a site-specific flood risk assessment. Planning practice guidance advises when an exception test will be required, which will depend on the vulnerability of the development and the flood zone it lies within.

Do I need to submit a flood risk assessment with my planning application?

You'll need to submit a flood risk assessment if your application lies within flood zones 2 or 3 or is over 1 hectare within flood zone 1. You'll also need to submit an assessment if your proposal could be affected by sources of flooding other than from rivers or the sea. For certain lower risk applications, we've provided 'flood risk standing advice' which enables local planning authorities to assess flood risk assessments without the need to consult us.

What information should I include in my flood risk assessment?

We recommend that you refer to the checklist for a site-specific flood risk assessment for detailed advice on what to include in your flood risk assessment. Alongside referring to your LPA's strategic flood risk assessment, you should contact your LPA to find out whether there are any development guidelines which are specific to your locality.

Can I undertake my own flood risk assessment?

Your FRA must be appropriate to the scale, nature and location of the development whilst being credible and fit-for-purpose. Whilst it's possible to undertake your own assessment, most applicants employ suitably experienced professionals. We're not able to recommend specific consultants, but a simple web search should help you source a competent individual or company.

Do I need to consider how climate change will affect my proposal's flood risk?

Yes, you should demonstrate how flood risk will be managed now and over the development's lifetime, taking climate change into account. Please refer to the following guidance when undertaking your flood risk assessment. In some cases we'll hold the climate change flood data you need. In others you'll need to undertake your own analysis to understand the impacts.

Where can I get modelled or historic flood levels from?

Email our Customers and Engagement team (neyorkshire@environment-agency.gov.uk) to find out whether we have any modelled or historic flood levels available for your development site. A list of the packages of information we're able to provide can be found under the 'get information to complete an assessment' section of the planning practice guidance. They'll aim to provide this information within 20 days. We no longer charge for providing this information.

The risk portrayed by your flood map doesn't seem to reflect the site's actual risk. How do I 'challenge' your flood map?

If you have evidence suggesting that our flood map is inaccurate, please contact our Customers and Engagement team (neyorkshire@environment-agency.gov.uk) who will provide you with any existing data we hold. To formally contest our flood zones, you'll need to submit supporting evidence, such as digital copies of a topographic survey or modelling for quality assurance purposes. Digital files of the proposed new flood zones in ArcMap or MapInfo format should also be supplied. Any new outline data you submit must conform to our flood zones policy, copies of which are available on request.

Whilst we'll usually be happy to review any topographical survey or model prior to the application being submitted, we would have to recover our costs for this work. In some cases where work to review and update our existing models is already underway, we may decline to consider a challenge.

As we have to be certain that the data which informs our flood map is fit-for-purpose, any revisions will need to meet stringent quality checks.

SURFACE WATER AND DRAINAGE

Who's responsible for managing surface water?

Lead local flood authorities are responsible for providing advice on the management of surface water resulting from new major development. Internal drainage boards, where established, have permissive powers to manage water levels within their drainage districts, so also play a key role in managing surface water.

Will I need to provide surface water storage and limit the discharge rate?

You should contact your lead local flood authority to discuss surface water discharge rates and storage requirements. Typically, they'll ask that your development does not increase run-off and limits the discharge to the existing greenfield run-off rate (usually 1.4l/s/ha if not calculated).

Do I need to install sustainable drainage systems?

Sustainable Drainage Systems (SuDS) should always be carefully considered in discussion with your lead local flood authority. A SuDS scheme can reduce flood risk, improve water quality, create better habitats for wildlife, and produce pleasant, more amenable places for people.

Infiltration drainage must not, however, pose a risk to groundwater quality. All infiltration SuDS must:

- Meet the groundwater protection criteria set out on GOV.UK
- Not be constructed in ground affected by contamination

Who should I contact about connecting my development to the mains sewer?

Talk to your water company about connecting to their sewerage system. Here are some contact details for water companies operating in the Yorkshire Environment Agency area:

Yorkshire Water	planningconsultation@yorkshirewater.co.uk
Northumbrian Water	developmentenquiries@nwl.co.uk
Severn Trent Water	new.connections@severntrent.co.uk

My development is a long way from the mains sewer. Can I install a 'non-mains' drainage system, such as a package treatment plant?

New development should connect to the public mains sewer wherever possible. Individual treatment plants can deteriorate local water quality and are more challenging to monitor and regulate. If you can't connect to the mains sewer, your planning submission should outline how you will deal with foul drainage discharge. You should include evidence as to why it is not possible to connect to the mains system, including details of any prohibitive costs. Please note that some 'non-mains' foul water drainage systems will require an environmental permit, irrespective of any planning approval.

OTHER ENVIRONMENTAL CONSIDERATIONS

What other environmental issues will you consider with my planning application?

Your planning application will need to demonstrate that any environmental risks can be managed, through design and construction, for the development's lifetime. Alongside flood risk, the key environmental risks we'll consider are:

- **Land Contamination**
  We're mainly interested in those sites where there is a risk of pollution to controlled waters. You should investigate any contamination to see whether the environmental risk or cost of clean-up (remediation) would hinder your proposal. If contamination is known or suspected, a desktop study, investigation, remediation and other works may be required to enable safe development. Our model procedures for the management of land contamination provide further information.

- **Pollution prevention**
  Your application should demonstrate how you'll minimise the risk of pollution from all aspects of your development, including construction and

operation phases. Groundwater can be vulnerable to pollution, as well as rivers and streams. Some areas (source protection zones and aquifers) are especially sensitive to pollutants as they typically supply public drinking water. To find out whether your development is located in an area sensitive to groundwater pollution, visit our interactive maps. Advice on groundwater protection can be found on GOV.UK

- **Fisheries, biodiversity, geomorphology and protected species**
  If your proposal is likely to affect the ecology of a main river, you'll need to carry out a risk assessment. This assessment should show that your development can proceed without demonstrable harm, and should propose mitigation, compensation or enhancements where required. A survey should be carried out if any protected species are thought to be nearby. If this survey confirms the presence of protected species or their habitat, measures should be taken to manage the development's risks. Natural England are the statutory consultee for other biodiversity-related matters. Further information on their remit can be found on GOV.UK

- **Water framework directive**
  If your proposal affects ground or surface waterbodies, you'll need to consider the Water Framework Directive (WFD) and the actions set out in the Humber River Basin Management Plan. You'll also need to submit a WFD Assessment demonstrating how the development will prevent deterioration and improve the waterbody's ecological status.

- **River buffer zone**
  Your development should ensure that an 8m strip of land (planted with locally appropriate, native species) is left undisturbed next to the bank of any main river. This 'river corridor' will improve habitat connectivity and will ensure we're able to access the bank for any future flood defence construction and maintenance.

- **Culverting**
  We're opposed to culverting. Culverts degrade watercourses' ecology and prevent the movement of wildlife and fish. As culverts can easily become blocked, they increase flood risk. They're also difficult to inspect and maintain. We may object to any planning applications involving culverting on a main river and may refuse to grant an environmental permit. Existing culverts should be removed and the river channel and bankside habitat reinstated to restore the ecological continuity of the river channel and its corridor.

Will I need any other Environment Agency permits for my development?

You might need an environmental permit if your development manages or produces waste or emissions that pollute the air, water or land or is work that affects a main river or a sea defence. The lead local flood authority is responsible for any consents relating to ordinary watercourses.

The Environmental Permitting Regulations (England and Wales) 2015 cover water discharges, groundwater activities, flood risk activities, radioactive substances, waste, mining waste and installations. They also include provision for a number of directives including batteries. Further information, including contact details for further permitting related enquiries, can be found here.

As planning and permitting decisions are often closely linked, we have issued detailed guidance for developments requiring planning permission and environmental permits. This guidance explains how, when responding to planning consultations that require environmental permits, we will advise of three possible positions:

- No major permitting concerns
- More detailed consideration is required and parallel tracking is recommended
- Don't proceed – unlikely to grant a permit.

PRE-APPLICATION ADVICE

Can you provide site-specific advice, review a submission document, or attend a site meeting before I submit my planning application?

We encourage you to seek pre-application advice as it can help you solve key environmental issues early, reduce the chance of an objection and help you design a more sustainable development. If you'd like to take advantage of this service, please email our Sustainable Places team so that we can provide further details and estimated costs.

Please note that any pre-application guidance we provide doesn't represent our final view in relation to any future planning application. We recommend that you seek your own expert advice prior to submitting your application.

Who should I contact for further information?

Yorkshire planning enquiries: sp-yorkshire@environment-agency.gov.uk

General enquiries: 03708 506 506

Environment Agency, Lateral, 8 City Walk, Leeds LS11 9AT
https://www.gov.uk/government/organisations/environment-agency

Sequential Test
The local planning authority will need to be satisfied that the development passes the Flood Risk Sequential Test. We recommend that this requirement is discussed with them at an early opportunity.

The aim of the Sequential Test, in summary, is to steer new development to areas at the lowest probability of flooding (see paragraph 101 of the National Planning Policy Framework (NPPF)), and therefore in the first instance the local planning authority (LPA) should be satisfied that the Sequential Test has been applied to justify development in this location, and to allow the Exception Test to be considered.

Information to be included in a Flood Risk Assessment
A flood risk assessment (FRA) must be submitted with a planning application on any proposed development site in flood zone 2 or 3 and any site over 1ha within Flood Zone 1. The FRA assessment would need to demonstrate that the development would not increase the risk of flooding to others and would not be at risk of flooding itself.

All potential sources of flooding will need consideration including; river flooding, groundwater flooding, surface water runoff and flooding from sewers etc. It should also assess the existing and proposed surface water drainage from the site.

Further information on producing a FRA and where a FRA is required can be found on the Environment Agency's website on the Flood Risk Standing Advice pages which can be found at: https://www.gov.uk/guidance/flood-risk-assessment-for-planning-applications

A more comprehensive guide on FRA's can be found in CIRIA Report C624 'Development and flood risk - guidance for the construction industry' available through their website: http://www.ciria.org.

Your Local Planning Authority should have undertaken a Strategic Flood Risk Assessment, where information on flood risk locally has been collated which may inform your FRA. Please contact your Local Planning Authority to determine what information may be available.

Floor Levels
Setting the ground floor level above site ground level will provide a measure of protection against any flooding. In flood zone 3 finished floor levels should be set no lower than 600mm for residential or 300mm for industrial/commercial above the 1% (1 in 100) climate change modelled flood level.

Updated guidance on how climate change could affect flood risk to new development - 'Flood risk assessments: climate change allowances' was published on gov.uk on 19 February 2016. You should confirm the flood risk vulnerability classification and lifetime of your proposed development in line with NPPF and apply the appropriate climate change allowances. The River Don catchment falls within the Humber River Basin District.

Access & Egress

Cont/d..

Identification of safe access and egress for the property during a flood event should be made. It is recommended that a flood evacuation plan should be formulated and dwelling occupants are advised to sign up to Floodline Warnings Direct. This can be done online at https://www.gov.uk/sign-up-for-flood-warnings or by phoning Floodline Warnings Direct on 0345 988 1188.

Compensatory storage
Where a development is likely to increase flood risk by taking up flood plain storage, it may be necessary to provide compensatory storage to mitigate this risk. Compensation works are divided into direct and indirect. These terms come from CIRIA report C624 "Development and flood risk – guidance for the construction industry (2004)".

Direct or 'level for level' methods as they are also known re-grade the land at the same level as that taken up by the development. Direct schemes therefore provide a direct replacement for the lost storage volume.

Indirect methods rely on water entering a storage area which then releases water at a slower rate, akin to a surface water attenuation scheme. The storage area can be remote from the flood plain or even a tank. Indirect schemes are complicated to design and construct and require a more intensive maintenance regime, which must be continued indefinitely. For these reasons we are generally opposed to indirect schemes unless a planning decision has already been made and they are the only remaining option.

Surface Water Runoff
As of the 15th April 2015, the Environment Agency no longer a statutory consultee for surface water drainage proposals. The lead Local Flood Authority should be consulted in relation to the suitability and acceptability of any surface water management scheme.

Discharging to watercourse
Where a new surface water drainage connection to a main river is proposed, pre-approval from the Environment Agency must be sought. New connections must be discharged at Greenfield run off rate. The acceptable greenfield runoff rate is normally 5 litre/second/hectare, but you should consult with the Lead Local Flood Authority for variances in their district. If it is an existing brownfield site then 30% reduction in discharge will be required if the site bigger than 1ha.

Environmental Permitting Regulations
This development may require a permit under the Environmental Permitting (England and Wales) Regulations 2010 from the Environment Agency for any proposed works or structures, in, under, over or within eight metres of the top of the bank of the River Don, designated a 'main river'. This was formerly called a Flood Defence Consent. Some activities are also now excluded or exempt. A permit is separate to and in addition to any planning permission granted. Further details and guidance are available on the GOV.UK website: https://www.gov.uk/guidance/flood-risk-activities-environmental-permits.
It can take up to two months to determine the application from being duly made. Every effort will be made to process it as quickly as possible, but you are reminded that works should not commence until the permit is granted.

Please note that the view expressed in this letter by the Environment Agency is a response to a pre-application enquiry only and does not represent our final view in relation to any future planning application made in relation to this site. We reserve the right to change our position in relation to any such application.

Cont/d..

Appendix 5 – Barnsley Metropolitan Borough Council

Appendix 7 – PDS Flow Calculations



British Geological Survey
NATURAL ENVIRONMENT RESEARCH COUNCIL

BGS ID: 203535 : BGS Reference: SK29NE5
British National Grid (27700) : 429008,399941 Report an issue with this borehole

2.

1063 Wt. 22438/0384 10M 7/45 (51) F.&S. SK 29 NE/5

RECORD OF WELL (SHAFT OR BORE)

(For Survey use only) N.2150
1 inch Map Registered No. 87/144 B
87/144

Parish of Hunshelf.
At Greenmoor Quarries, nr Village
Town or Village of Thurgoland
County YORKS(W.R.) Six-inch quarter sheet 282 NW/W
For Mr. Co. Boro. of Barnsley

Exact site of well
Attach a tracing from a map, or a sketch-map, if possible.

Level of ground surface above sea level (O.D.) 516·5 ft. OD
If well-top is not at ground level, state how far ... above; — below; ft.

SHAFT ft.; diameter ft. Details of headings

BORE 200 ft.; diameter of bore: at top 27 ins.; at bottom 24 ins. Lengths, diameters, perforations, etc., of lining tubes 21" dia. Perforated tubes from 200 ft up to 32'5". 24" diameter solid tubes O to 39 ft

Water struck at depths. below well top, of (feet) Unknown
Not yet tested (June 48)

Rest-level of water 25 ft. ~~above~~ below well-top. Suction at ft. Yield on hours' days' pumping, gal. per with depression to ft. below well-top, Capacity of pump g.p.h. Recovery to rest level in mins. hours Date of measurements Date of well 16/2/48

Quality of water (*attach copy of analysis if available*)

Well made by John Thorn Ltd

Information from Barnsley Corporation Waterworks Deptt.

Additional notes in space overleaf.

(For Survey use only) GEOLOGICAL CLASSIFICATION	NATURE OF STRATA	THICKNESS Feet	THICKNESS Ins.	DEPTH Feet	DEPTH Ins.
	If measurements start below ground surface, e.g., from bottom of an existing shaft, state how far				

British Geological Survey

Continued over leaf

GEOLOGICAL SURVEY AND MUSEUM, SOUTH KENSINGTON, LONDON, S.W.7.	Date received	Correspondence File No.	1" N.S. Map No.	1" O.S. Map No.	File marked (use symbol) on 1" Map	on 6" Map
	30-11-48		87		O	O

British Geological Survey
NATURAL ENVIRONMENT RESEARCH COUNCIL

BGS ID: 203535 : BGS Reference: SK29NE5
British National Grid (27700) : 429008,399941 Report an issue with this borehole

2.

1063 Wt. 22438/0384 10M 7/45 (51) F.&S.

RECORD OF WELL (SHAFT OR BORE)

(For Survey use only) N.2160

1 inch Map Registered No. 87 SK29/5B 144B

87/144

At Cream moon Quarries, nr Village Parish of Hunshelf.

Town or Village of Thurgoland

County YORKS(WR) Six-inch quarter sheet 282 NW/W

For Mr. Co. Boro. of Barnsley

Exact site of well

Attach a tracing from a map, or a sketch-map, if possible.

Level of ground surface above sea level (O.D.) 516·5 ft. OD

If well-top is not at ground level, state how far ... {above; / below: } ft.

SHAFT ft.; diameter ft. Details of headings

BORE 200 ft.; diameter of bore: at top 27 ins.; at bottom 24 ins. Lengths, diameters, perforations, etc., of lining tubes 21" dia. Perforated tubes from 200 ft. up to 32'5". 24" diameter solid tubes 0 to 39 ft.

Water struck at depths, below well top, of (feet) Unknown Not yet tested (June 48)

Rest-level of water 25 ft. above / below well-top. Suction at ft. Yield on hours' / days' pumping, gal. per with depression to ft. below well-top, Capacity of pump g.p.h. Recovery to rest level in mins. / hours Date of measurements Date of well 16/2/48

Quality of water (*attach copy of analysis if available*)

Well made by John Thom Ltd

Information from Barnsley Corporation Waterworks Deptt.

Additional notes in space overleaf.

(For Survey use only) GEOLOGICAL CLASSIFICATION	NATURE OF STRATA	THICKNESS Feet	THICKNESS Ins.	DEPTH Feet	DEPTH Ins.
	If measurements start below ground surface, e.g., from bottom of an existing shaft, state how far				

Continued over leaf

British Geological Survey

GEOLOGICAL SURVEY AND MUSEUM,
SOUTH KENSINGTON,
LONDON, S.W.7.

Date received	Correspondence File No.	1" N.S. Map No.	1" O.S. Map No.	File marked (use symbol) on 1" Map	File marked (use symbol) on 6" Map
30-11-48		97		G	G

http://scans.bgs.ac.uk/sobi_scans/boreholes/203535/images/14485860.html

itish
eological Survey
TURAL ENVIRONMENT RESEARCH COUNCIL

BGS ID: 203535 : BGS Reference: SK29NE5
British National Grid (27700) : 429008,399941 Report an issue with this borehole

RECORD OF WELL (SHAFT OR BORE) 87

1" N.S. 1" O.S. SK 29 | 5E
Grid Ref. 144

At GREENMOOR QUARRIES

Town or Village HUNSHELF County YORKS. Six-inch quarter sheet 2 nw/w

Exact site Plan attached SK 29 NE/5 (2902 9994) } (A rough sketch or a tracing map is very de

in parish of } B

Level of ground surface above sea-level (O.D.) 516·10 ft. If well starts below ground surface, state how far

Shaft ft., diameter ft. Bore 202 ft. Diameter of bore: at top 27 ins.; at bottom 24 ins.

Details of permanent lining tubes (internal diameters preferred) Record of 87/144 B. in folder attached.

Water struck at depths of (feet)

Rest-level of water below / above top of well feet. Suction at feet. Yield on hours' / days' test gallons per (with pump of capacity g.p.h.); depressing water level to feet below top. Time of recovery hrs. Amount normally pumped daily g.p.h. for hours.

Quality (attach copy of analysis if available)

Sunk by for Mr. Barnsley Waterworks Dept. Date of well 16·2·48 - 11·5·48.

Information from Visited by P.A.Allen - V.A.Eyles 16·6·45.

(For Survey use only). GEOLOGICAL CLASSIFICATION.	NATURE OF STRATA (and any additional remarks).	THICKNESS Feet.	THICKNESS Inches.	DEPTH Feet.	DEPTH Inches.
	No record	5	0	5	0
Drift	Soft brown clay & gravel	13	0	18	0
	Grey shale, clay & gravel	2	0	20	0
	Very hard grey shale	6	0	26	0
	Hard rock	4	0	30	0
	Hard grey shale with bands of rock	9	0	34	0
	Hard massive sandstone	6	0	45	0
	Grey siltstone. Micaceous, with many sandstone lenticles & laminations	2	0	47	0
	Fine micaceous sandstone with many micaceous planes. False bedding at 100'	67	6	114	6
	Coarse grey siltstone. Micaceous, with much plant debris		6	115	0
Carboniferous Westphalian A	Grey-brown sandstone. Fine micaceous with micaceous bedding planes. Reacts with weak hydrochloric acid.	6	0	121	0
	Micaceous sandstone	6	0	127	0
	Sandstone and coarse siltstone interlaminated	6	0	133	0
	Sandstone with many siltstone laminations	8	0	141	0
	Micaceous sandstone	5	0	146	0
	Dark grey siltstone with occasional sandstone laminations	4	0	150	0
	Fine sandstone and grey siltstone interlaminated and interbedded. Small scale false bedding and 1" bands of clinging ore top	10	0	160	0
	Dark grey fine siltstone with sandstone laminations and thin bands especially 166 - 176.	40	0	200	0
	Cores not extracted	2	0	202	0
	Water level at start of rotary boring (29') 12'6" down.	✓		✓	
	" " end " " " 25'4" "				

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GEOLOGICAL SURVEY AND MUSEUM,
SOUTH KENSINGTON,
LONDON, S.W.7.

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Date received	G.S.M. Office File No.	Site marked on 1" map (use symbol)
30.11.49		⊙

British Geological Survey

(*11418) Wt.29151/D.869 10,000 9/49
A.& E.W.Ltd. Gp.666

is thereby consistent with Green Belt policy. As the proposal is consistent with Green Belt policy, the proposal is also compliant with Core Strategy Policy CSP8 The Location of Growth.

The proposal is therefore acceptable in principle subject to the dwelling being designed in accordance with standards set within the SPD Designing New Housing Development and the South Yorkshire Residential Design Guide.

The consultees have offered the following comments:-

Trees

The Tree Officer states:- 'The site does contain some trees and as such a tree survey will be required with any application. The information in the survey should be used to inform the proposed layout and if trees are to be implicated in the scheme an arboricultural impact assessment may also be required. Understandably no tree survey has been submitted at this stage and as such it is not possible to offer more meaningful comments at present.'

Highways

The Highways Officer states: -The enquiry site is an infill plot accessed via a field gate off Old Mill Lane. The site slopes away from the road, southwards, towards the river Don. The sketch submitted with the enquiry shows the property built in line with the existing building line which would involve made ground. It is not clear as to the size of the proposed dwelling and therefore how many parking spaces, in addition to the integral garage, would be needed. Access, turning and parking provision must comply with the standards in the South Yorkshire Residential Design Guide, Lifetime Homes and SPD2-Parking. An area shall be set aside adjacent to the highways for waste collection and waste recycling bins on collection days.

SYMAS

The site is not within a coal mining referral area, therefore a Coal Mining Risk Assessment would not be required.

Drainage

The Drainage Officer states:- The Council has records showing the southern boundary of this site is following the alignment of the River Don

I would confirm that to my knowledge part of the site is in flood zone 2 on the Environment Agency maps

The developer's attention is drawn to the following:

There should be no increase in surface water runoff from the new development. PPS25 recognises that the management of flood risk is not simply restricted to flood plains and that a catchment-wide approach should be employed.

There is a foul sewer adjacent to the site. The developer should contact Yorkshire Water if they wish to discharge to this sewer to discuss allowable discharge rates.

Any balancing facility should be designed to accommodate a 1 in 30 year flow from the site below ground and a 1 in 100 year flow retained within the site (including an allowance of 30% for climate change), without causing any flooding to buildings.

There are alternatives to conventional storage for the control of surface water run-off that are favoured by the authority where ground conditions are suitable. Sustainable Urban Drainage techniques (SUD's) tackle surface water run-off problems at source using features such as soakaways, permeable pavements, grassed swales; infiltration trenches, ponds and wetlands to attenuate flood peak flows, produce water quality improvements and environmental enhancements.

Appendix 6 – Borehole Log

British Geological Survey
NATURAL ENVIRONMENT RESEARCH COUNCIL

BGS ID: 203535 : BGS Reference: SK29NE5
British National Grid (27700) : 429008,399941 Report an issue with this borehole

SK 29 NE/3

RECORD OF WELL (SHAFT OR BORE) 87

1" N.S. _____
1" O.S. _____
Grid Ref 29 99

144 B

At GREENMOOR QUARRIES

Town or Village HUNSHELF County YORKS. Six-inch quarter sheet

Exact site Plan attached. (A rough sketch or a tracing of a map is very desirable)

in parish of

Level of ground surface above sea-level (O.D.) 516·30 ft. If well starts below ground surface, state how far

Shaft ft., diameter ft. Bore 202 ft. Diameter of bore: at top 27 ins.; at bottom 24 ins.

Details of permanent lining tubes (internal diameters preferred)

Record of 87/144 B. in folder attached.

Water struck at depths of (feet)

Rest-level of water above / below top of well feet. Suction at feet. Yield on hours' / days' test

gallons per (with pump of capacity g.p.h.); depressing water level to feet below top. Time of recovery hrs. Amount normally pumped daily g.p.h. for hours.

Quality (attach copy of analysis if available)

Sunk by for Mr. Barnsley Waterworks Dept. Date of well 16.2.48 - 11.5.48.

Information from Visited by R.A.Dobbs - V.A.Dykes 16.6.48.

(For Survey use only). GEOLOGICAL CLASSIFICATION.	NATURE OF STRATA (and any additional remarks).	THICKNESS Feet.	THICKNESS Inches.	DEPTH Feet.	DEPTH Inches.
	No record	5	1·52 0	5	1·52 0
	Soft brown clay & gravel.	13	3·96 0	18	5·49 0
	Grey shale, clay & gravel	2	0·61 0	20	6·10 0
	Very hard grey shale.	6	1·83 0	26	7·92 0
	Hard rock	4	1·22 0	30	9·14 0
	Hard grey shale with bands of rock.	9	2·94 0	39	11·89 0
	Hard massive sandstone	6	1·83 0	45	13·72 0
	Grey siltstone. Micaceous, with many sandstone laminations & laminations.	2	0·61 0	47	14·33 0
	Fine micaceous sandstone with many micaceous planes. False bedding at 100'.	67	20·57 6	114	34·10 6
	Coarse grey siltstone. Micaceous, with much plant debris.		0·15 6	115	35·05 0
	Grey-brown sandstone. Fine micaceous with micaceous bedding planes. Reacts with weak hydrochloric acid.	6	1·83 0	121	36·88 0
	Micaceous sandstone	6	1·83 0	127	38·71 0
	Sandstone and coarse siltstone interlaminated	6	1·83 0	133	40·54 0
	Sandstone with many siltstone laminations	8	2·44 0	141	42·98 0
	Micaceous sandstone	5	1·52 0	146	44·50 0
	Dark grey siltstone with occasional sandstone laminations	4	1·22 0	150	45·72 0
	Fine sandstone and grey siltstone interlaminated and interbedded. Small scale false bedding and 1" bands of slumping at top	10	3·05 0	160	48·77 0
	Dark grey fine siltstone with sandstone laminations and thin bands especially 166 - 176.	40	12·19 0	200	6·96 0
	Core not saturated	2	0·61 0	202	61·57 0
	Water level at start of rotary boring (39') 12'6" down.	✓		✓	

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Date received	G.S.M. Office File No.	Site marked on 1" map (use symbol)
30.11.49		⊙

(°11815) Wt.20051/0.300 10,000 9/39
A.& E.W.Ltd. Op.884

CAUSEWAY

Drainage Design Report

Flow+

v6.0

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Network	Storm Network
Filename	J:\Projects\1514 - Mr Doug Sanderson\001 - Old Mill Lane, Thurgoland\Pds\Flow\runoff rates.pfd
Username	Mark Jarvis (mark.jarvis@enzygo.com)
Report produced on	19/03/2018 10:02:14

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Rainfall Methodology	FSR
Return Period (years)	1
Additional Flow (%)	0
FSR Region	England and Wales
M5-60 (mm)	20.000
Ratio-R	0.300
CV	0.750
Time of Entry (mins)	5.00
Maximum Time of Concentration (mins)	30.00
Maximum Rainfall (mm/hr)	50.0
Minimum Velocity (m/s)	1.00
Connection Type	Level Soffits
Minimum Backdrop Height (m)	0.200
Preferred Cover Depth (m)	1.200
Enforce best practice design rules	

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Rainfall Methodology	FSR	Return Period (years)	Climate Change (%)
FSR Region	England and Wales	1	0
M5-60 (mm)	20.000		
Ratio-R	0.300		
Summer CV	0.750		
Winter CV	0.840		
Analysis Speed	Normal		
Drain Down Time (mins)	1440		
Additional Storage (m³/ha)	20.0		
Storm Durations (mins)	15		
	30		
	60		
	120		
	180		
	240		
	360		
	480		
	600		
	720		
	960		
	1440		
Check Discharge Rate(s)			
1 year (l/s)	0.1		
30 year (l/s)	0.1		
100 year (l/s)	0.2		
Check Discharge Volume			
100 year 360 minute (m³)			

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Site Makeup	Greenfield
Greenfield Method	IH124
Positively Drained Area (ha)	0.035
SAAR (mm)	817
Soil Index	2
SPR	0.30
Region	3
Growth Factor 1 year	0.86
Growth Factor 30 years	1.75
Growth Factor 100 years	2.08
Betterment (%)	0
QBar	0.1
Q 1 year (l/s)	0.1
Q 30 year (l/s)	0.1
Q 100 year (l/s)	0.2

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Appendix 8 – Microdrainage Calculations

FSR Data | FEH Data | IDF/CRP Data

Region: England and Wales

Map

M5-60 (mm): 20.000

Ratio R: 0.300

Summer Profile ○

Winter Profile ◉

Return Period (years): 1.0

Peak Intensity (mm/hr): 47.562

Ave. Intensity (mm/hr): 19.178

Storm Duration (mins): 30

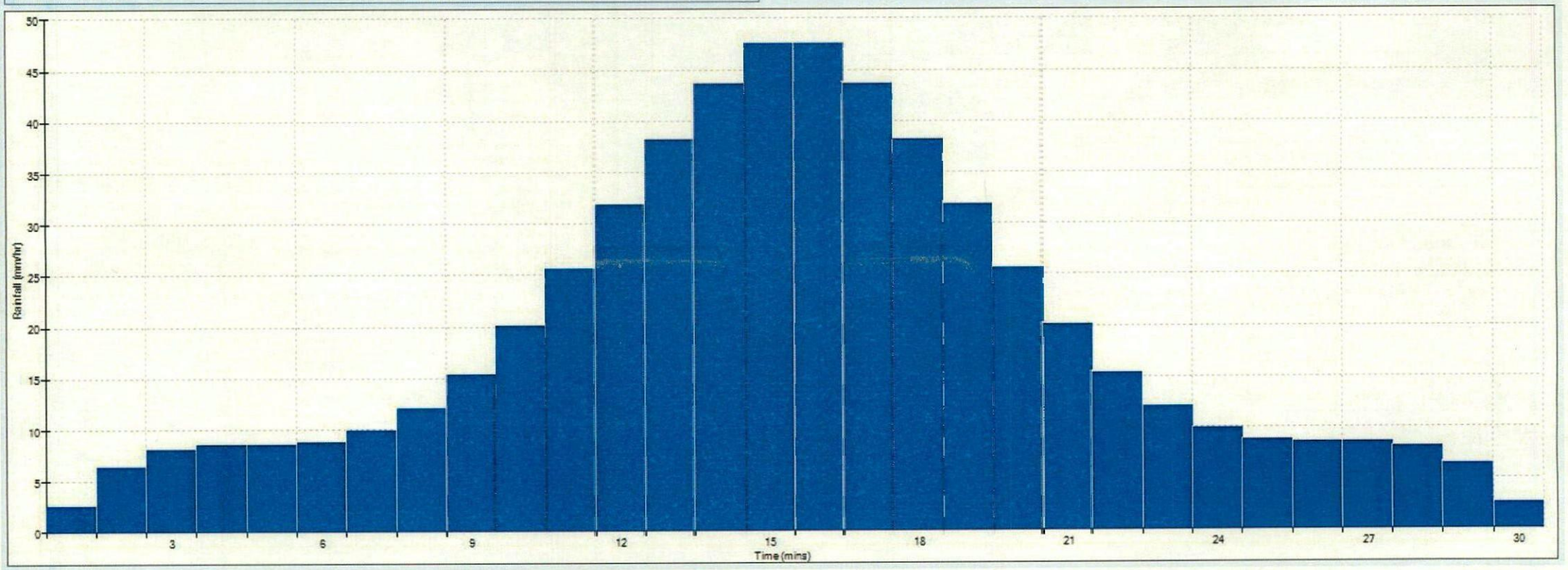
Generate

Micro Drainage

OK

Cancel

Help



FSR Data | FEH Data | IDF/CRP Data

Region: England and Wales

Map

M5-60 (mm): 20.000

Ratio R: 0.300

Summer Profile ○

Winter Profile ◉

Return Period (years): 30.0

Peak Intensity (mm/hr): 116.762

Ave. Intensity (mm/hr): 47.082

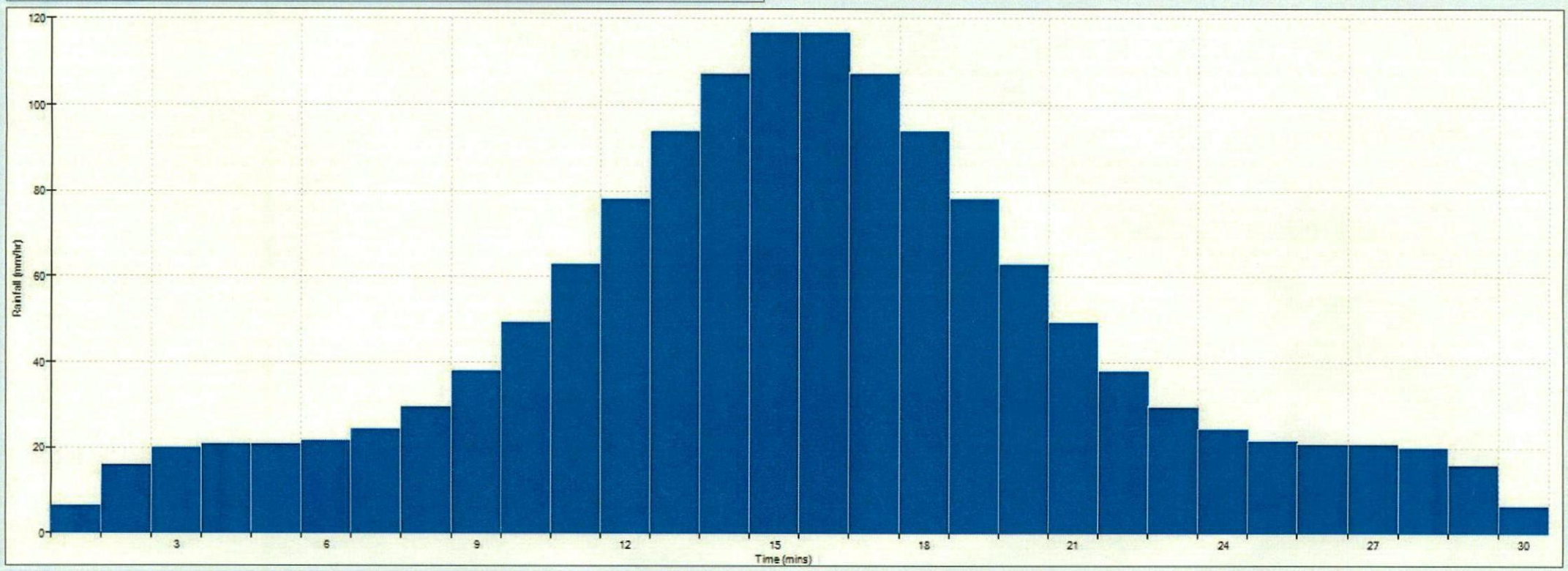
Storm Duration (mins): 30

Generate

OK

Cancel

Help



FSR Data | FEH Data | IDF/CRP Data

Region: England and Wales

Map

M5-60 (mm): 20.000

Ratio R: 0.300

Summer Profile: ○

Winter Profile: ◉

Return Period (years): 100.0

Peak Intensity (mm/hr): 152.610

Ave. Intensity (mm/hr): 61.537

Storm Duration (mins): 30

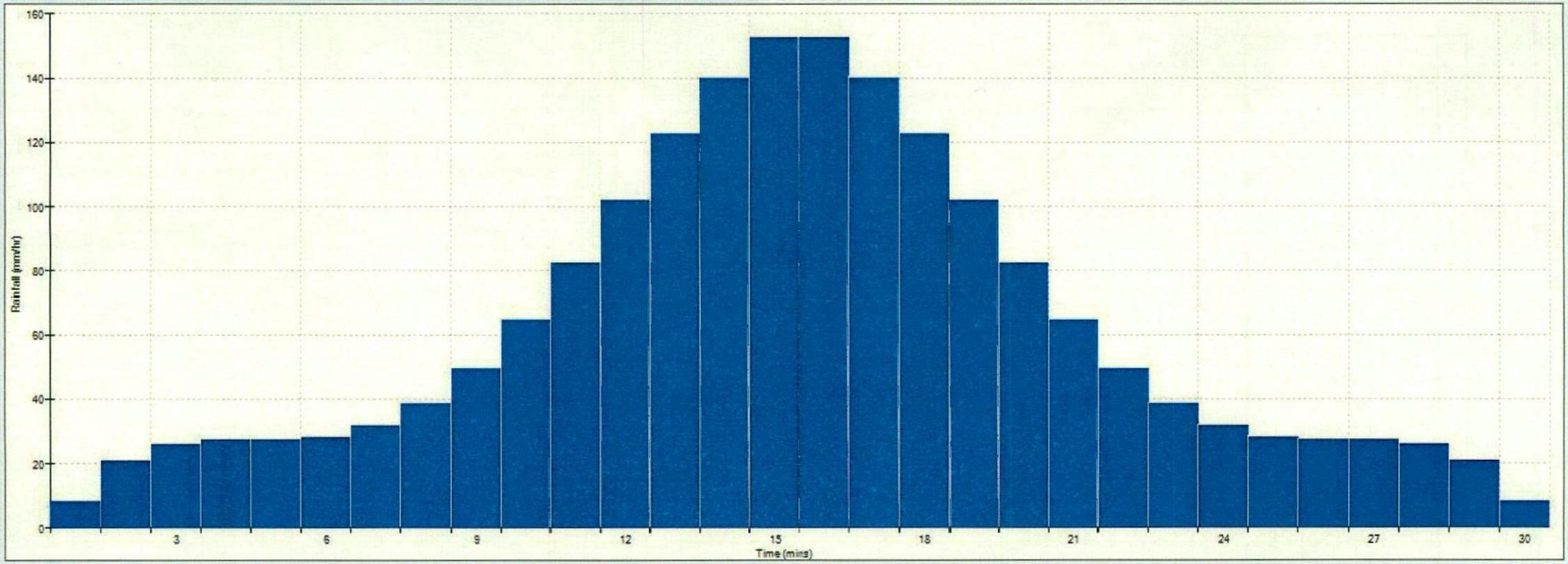
Generate

Micro Drainage

OK

Cancel

Help



Event	Imp Area	Ave rainfall rate	Flow
	Sq.m.	mm/hr	l/s
1 in 1 year	285	19.2	1.5
1 in 30 year	285	47.1	3.7
1 in 100 year	285	61.5	4.9



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