enzygo
environmental consultants

NPPF: Flood Risk Assessment

Land at Rockingham, Barnsley

Hartwood Estates Ltd

SHF.1109.002.HY.R.01.C

'Experience and expertise working in union'

enzygo.com

Contact Details:

Enzygo Ltd.
STEP Business Centre
Wortley Road
Deepcar
Sheffield
S36 2UH

tel: 0114 2903677
fax: 0114 2903688
email: hello@enzygo.com
www: enzygo.com

Land at Rockingham, Barnsley

Project:	NPPF: Flood Risk Assessment
For:	Hartwood Estates Ltd
Status:	Issued (Final)
Date:	March 2015
Author:	Scott Dawson BSc (Hons), MSc – Environmental Consultant
Reviewer:	Daniel Alstead BSc (Hons), MSc, MCIWEM – Senior Hydrologist
Approver:	Matt Travis, BSc (Hons), MSc, MCIWEM, C.WEM, CEnv, CSci – Director

Enzygo Limited Registered in England No. 6525159
Registered Office Stag House Chipping Wotton-Under-Edge Gloucestershire GL12 7AD

Contents

Tables & Figures

Drawings

1.0 Introduction

1.1 Background

1.1.1 At the request of Hartwood Estates Ltd, a Flood Risk Assessment (FRA) has been undertaken, in accordance with the National Planning Policy Framework (NPPF)[1] and supporting Planning Policy Guidance (PPG ID: 7)[2], outline planning application for the construction of an employment led mixed use scheme that comprises of employment led mixed use scheme that comprises of Business Offices (B1), Food & Drink (A3/A4), Employment Uses (B2), Hotel (C1) and Petrol Filling Station (Sui Generis). The development is proposed to be located on land off the Dearne Valley Parkway (A6195), Rockingham Nr Birdwell, Barnsley, South Yorkshire, S70 5TT (see Drawing 1). This has included an assessment of the surface water drainage requirements of the site.

1.1.2 This report details the flood risk at the site and how this could be managed and mitigated to allow the site to be developed. Developments may not present risks of flooding on-site and/or off-site if flooding is effectively managed.

1.1.3 Current guidance on development and flood risk[3] identifies several key aims for a development to ensure that it is sustainable in flood risk terms. These aims are as follows:

- the development should not be at a significant risk of flooding and should not be susceptible to damage due to flooding;
- the development should not be exposed to flood risk such that the health, safety and welfare of the users of the development, or the population elsewhere, is threatened;
- normal operation of the development should not be susceptible to disruption as a result of flooding;
- safe access to and from the development should be possible during flood events;
- the development should not increase flood risk elsewhere;
- the development should not prevent safe maintenance of watercourses or maintenance and operation of flood defences;
- the development should not be associated with an onerous or difficult operation and maintenance regime to manage flood risk. The responsibility for any operation and maintenance required should be clearly defined;
- future users of the development should be made aware of any flood risk issues relating to the development;
- the development design should be such that future users will not have difficulty obtaining insurance or mortgage finance, or in selling all or part of the development, as a result of flood risk issues;
- the development should not lead to degradation of the environment; and
- the development should meet all of the above criteria for its entire lifetime, including consideration of the potential effects of climate change.

[1] Department for Communities and Local Government (2012) National Planning Policy Framework.
[2] Department for Communities and Local Government (2014) Planning Practice Guidance ID: 7, Flood Risk and Coastal Change
[3] CIRIA (2004) Funders report CP/102 Development and Flood Risk – Guidance for the Construction Industry.

1.1.4 The FRA is undertaken with due consideration of these sustainability aims.

1.1.5 The key objectives of the FRA are:

- To assess the flood risk to the proposed development and to demonstrate the feasibility of appropriately designing the development such that any residual flood risk to the development and its users would be acceptable;
- To assess the potential impact of the proposed development on flood risk elsewhere and to demonstrate the feasibility of appropriately designing the development such that the development would not increase flood risk elsewhere; and
- To satisfy the requirements of national planning policy guidance which require FRAs to be submitted in support of planning applications.

1.2 Project Scope

1.2.1 In order to achieve the aims outlined above, a staged approach has been adopted in undertaking this FRA, in accordance with current best practice. A screening study has initially been undertaken to identify whether there are any potential sources of flooding at the site, which may warrant further consideration. Any potential flooding issues identified in the screening study have subsequently been considered in a scoping study. The aim of the scoping study is to review all available information and provide a qualitative assessment of the flood risk to the site and the impact of the site on flood risk elsewhere.

1.3 Report Structure

1.3.1 This FRA has the following report structure:

- Section 2 identifies the sources of information that have been consulted during the FRA;
- Section 3 describes the application area including the existing and proposed development;
- Section 4 outlines the flood risk to the existing and proposed development;
- Section 5 assesses the potential impacts of the proposed development on surface water drainage; and
- Section 6 presents a summary and conclusions.

2.0 Sources of Information

2.1 Sources of Information

2.1.1 General information regarding the site setting and hydrology of the application site has been obtained from the OS Explorer 278: Barnsley and Sheffield.

2.1.2 Information regarding the current flood risk at the application site, local flood defences and flood water levels has been checked against Environment Agency flood mapping available online.

2.1.3 A location plan of the buildings/structures that form the development is shown on Drawings 1 and 6.

2.2 Discussion with Regulators

2.2.1 A wide range of regulators should be consulted when carrying out an FRA. These include the Environment Agency, the Local Planning Authority (LPA), and Water Regulators. Consultation and discussions with the relevant regulators have been undertaken during this FRA.

2.3 Environment Agency

2.3.1 The Flood and Water Management Act 2010 gives the Environment Agency a strategic overview role for all forms of flooding and coastal erosion. They also have direct responsibility for the prevention, mitigation and remediation of flood damage for main rivers and coastal areas. The Environment Agency is the statutory consultee with regards to flood risk and planning.

2.3.2 Environment Agency Standing Advice and the NPPF has been consulted and reviewed during this FRA.

2.3.3 A data request was submitted to the Environment Agency in relation to flood risk at this site. A response was received from the Environment Agency on 16th July 2014. All correspondences with the Environment Agency have been included within Appendix 3.

2.4 Local Authorities

2.4.1 Planning guidance written by Barnsley Metropolitan Borough Council regarding flood risk was consulted to assess the mitigation policies in place. These documents include the evidence base for the Local Development Framework and the Local Plan. As part of this consultation the Barnsley Metropolitan Borough Council Strategic Flood Risk Assessment (SFRA)[4] has been referred to.

2.4.2 A written response from Barnsley Metropolitan Borough Council regarding flood risk has been received and is included in Appendix 5. Flood mapping produced as part of the Barnsley Metropolitan Borough Council SFRA has been included within Appendix 6.

[4] Barnsley Strategic Flood Risk Assessment (SFRA), September 2010.

2.5 Yorkshire Water

2.5.1 Yorkshire Water is responsible for the disposal of waste water and supply of clean water within the Birdwell area.

2.5.2 Specifically Yorkshire Water was consulted with regard to sewer capacity and flooding within the local area. A response was received from Yorkshire Water with information pertaining to local assets, their relevant capacities and invert levels on 13th August 2014. Further discussions regarding this information stating our proposed surface water connection points have been undertaken with Yorkshire Water with provisional agreement on discharge point and rates. All relevant correspondence along with information pertaining to the sites assets has been included in Appendix 4.

2.5.3 Information with regards to sewer and water main flooding contained within the SFRA has been consulted as part of this FRA. All Water Companies have a statutory obligation to maintain a register of properties/areas which are at risk of flooding from the public sewerage system, and this is shown on the DG5 Flood Register.

3.0 Description of Application Area

3.1 Site Location

3.1.1 The development site is located on land off the Dearne Valley Parkway (A6195), Rockingham near Birdwell, Barnsley, South Yorkshire.

3.1.2 The National Grid Reference of the site is 434956, 400539.

3.2 Existing Development

3.2.1 The development site is approximately 3.35 hectares (ha) in area.

3.2.2 The site is currently scrubland with no impermeable surfaces. Industrial units lie to the north and the west of the site boundary. The north-east boundary extends to further scrubland and agricultural areas beyond. The eastern and southern boundaries are immediately adjacent the Dearne Valley Parkway (A6195) with further scrubland located to the east of the main road.

3.3 Proposed Development

3.3.1 It is understood the proposals are for outline planning application for the construction of an employment led mixed use scheme that comprises of Business Offices (B1), Food & Drink (A3/A4), Employment Uses (B2), Hotel (C1) and Petrol Filling Station (Sui Generis) (see Appendix 1).

3.3.2 Further details with regard to the proposed development can be found in the information submitted with the planning application.

3.4 Topographic Information

3.4.1 A detailed topographic survey of the site was undertaken by HH Surveys Ltd on 4th August 2014.

3.4.2 With reference to the topographic survey, the site slopes gently in a northerly direction from a peak on the southern boundary of 139.50mAOD to a low of 133.80mAOD located on the northern boundary of the site; a fall equivalent to 5.7m over a distance of 350m or a 1:61 slope.

3.5 Catchment Hydrology

3.5.1 The closest 'Main River' within the area is Blackburn Brook, which flows in a south-easterly direction approximately 2.4km to the south-west of the site. Blackburn Brook is a 'Main River' maintained by the Environment Agency but does not in any way contribute to drainage or the catchment of the site.

3.5.2 There are two unnamed 'Ordinary Watercourses' located south-east of the Rockingham Roundabout, located at the north-eastern corner of the site. The closest of these Ordinary Watercourses to the site is at a distance of approximately 120m to the north-east of the site boundary. These Ordinary Watercourses are thought to flow in a northerly direction away from the site and contribute to the Short Wood Dike catchment. These ordinary watercourses are maintained by the local drainage authority, Barnsley Metropolitan Borough Council.

4.0 Flood Risk

4.1 Potential Sources of Flooding – Level 1 Screening Study

4.1.1 All potential sources of flooding must be considered for any proposed development. A summary of the potential sources of flooding and a review of the potential risk posed by each source at the application site is presented in Table 4.1.

Table 4.1: Potential Risk Posed by Flooding Sources

Flooding Source	Potential Flood Risk at Application Site?	Potential Source	Data Sources
Fluvial flooding	No	Unnamed Ordinary Watercourses	Environment Agency, SFRA
Tidal flooding	No	None Identified	Environment Agency
Flooding from rising / high groundwater	Yes	Aquifer	BGS Map, SFRA
Overland flow flooding	Yes	Poor permeability	RMS Map. SFRA
Flooding from artificial drainage systems	No	Sewers	Yorkshire Water, SFRA
Flooding due to infrastructure failure	No	None Identified	Environment Agency. OS Map

Fluvial Flooding Sources

4.1.2 As noted above, the nearest 'Main River' is Blackburn Brook 2.4km to the south-west of the site. This will not contribute to the site area in anyway thus its associated risk has not been considered further within this FRA.

4.1.3 Two unnamed watercourses (Ordinary Watercourses) flows in northerly direction and are located 120m to the north-east of the north-east boundary intersection at their closest point. They are located to the opposite (eastern) side of the Dearne Valley Parkway (A6195) and the associated Rockingham Roundabout. As they flow north away from the site, any risk associated with these watercourses is not thought to affect the site thus have not been considered further within this FRA.

4.1.4 The Environment Agency flood map shows that the site is entirely located within Flood Zone 1; outside the 1 in 1000 year return period (<0.1% AEP) (see Drawing 5).

4.1.5 Based on the above, the site has a 'low' risk of fluvial flooding from these sources.

Tidal Flooding Sources

4.1.6 The site is not located within the vicinity of tidal flooding sources. Therefore, flooding from this source is considered negligible and has not been considered further within this FRA.

Flooding from rising / high groundwater

4.1.7 The BGS Groundwater Flooding Susceptibility Map indicates a limited potential for groundwater flooding to occur in the western half of the site (see Drawing 3). The northern

corner of the site has a potential for groundwater flooding to occur at the surface. All other sections lie outside the potential for groundwater flooding.

4.1.8 The BGS data set is a hazard data set, not a risk data set, meaning that it does not provide any information about the likelihood of a groundwater flooding event occurring. It is noted that the BGS flood map is to be used as a screening tool, and should not be used to inform planning decisions.

4.1.9 Groundwater flooding tends to occur sporadically in both location and time. When groundwater flooding does occur, it tends to mostly affect low-lying areas, below surface infrastructure and buildings (for example, tunnels, basements and car parks) underlain by permeable rocks (aquifers).

4.1.10 As no below surface infrastructure and buildings are proposed for the site, as such the site is not considered at risk of flooding from rising / high groundwater. This will be mitigated by the adoption of a surface water management strategy for the site.

Overland flow flooding

4.1.11 Overland land flow flooding tends to occur sporadically in both location and time.

4.1.12 The site appears to be situated near to large areas of poor permeability or areas with the geology and/or topography which may result in overland flow flooding. This is based on a review of the soils mapping produced by the National Soils Resources Institute (Cranfield University). Soil maps show that the site is underlain by slowly permeable, seasonally wet, acid loamy and clayey soils with impeded drainage.

4.1.13 The JBA Consulting overland flow flood map shows that the majority of the site is located outside the 1 in 1000 annual return period of flooding (see Drawing 4). A small section in the northern corner of the site has a 1 in 1000 and 1 in 75 year surface water flooding risk.

4.1.14 Based on the above the majority of the site at negligible risk of flooding from overland flow and the northern corner of the site has a 'low-high' risk of overland flow flooding.

Flooding from Artificial Drainage Systems/Infrastructure Failure

Sewer Flooding

4.1.15 Sewer flooding occurs when urban drainage networks become overwhelmed and maximum capacity is reached. This can occur if there is a blockage in the network causing water to back up behind it or if the sheer volume of water draining into the system is too great to be handled. This type of flooding tends to occur sporadically in both location and time.

4.1.16 The majority of sewers are built to the guidelines within Sewers for Adoption[5]. These sewers have a design standard to the 1 in 30 year flood event and therefore it is likely that the majority of sewer systems will surcharge during rainstorm events with a return period greater than 30 years (e.g. 100 years). This was clearly the case during the 2007 flooding event when drains and sewers were rapidly overwhelmed by the intense and prolonged rainfall, and as such played a considerable role in the flood event.

4.1.17 Yorkshire Water is responsible for the disposal of waste water and supply of clean water within the area. Information with regards to sewer and water main flooding contained within the SFRA has been consulted as part of this FRA. Like all Water Companies, Yorkshire Water has a statutory obligation to maintain a register of properties/areas which are at risk of flooding from the public sewerage system, and this is shown on the DG5 Flood Register. This

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

includes records of flooding incidents from public foul sewers, combined sewers and surface water sewers which are maintained by the Water Company. When an incident is reported, a decision chart is used to assess whether the properties/areas are 'at risk' and then the record is added to the appropriate register.

4.1.18 Yorkshire Water reports that there are public combined sewer assets located within the site boundary (see Appendix 4). Yorkshire Water sewer plans show there is a Ø225mm public combined sewer flowing south along and just inside the western boundary of the site; presumed to be serving the industrial units abutting the northern boundary of the site. As the combined sewer flows south, a separate Ø300mm asset serving residential properties to the west and the Highways Agency depot on the western boundary, flows east into the site meeting with the Ø225mm combined asset from the north at a manhole junction. The combined Ø225mm asset from this junction then continues south along the western boundary of the site before heading out of the site boundary to the west near the southernmost corner of the site. This combined asset routes across the A61, along Moor Lane and continues west beneath the M1 Motorway.

4.1.19 Yorkshire Water provided no information on flooding related to local sewer assets as part of the asset enquiry as shown in Appendix 4.

Reservoir Flooding

4.1.20 Based on the Environment Agency Flood Map, the site is located outside the extent of flooding sourced from reservoirs.

Summary

4.1.21 Given the information that is available, it is considered that a 'low' level of flood risk is posed by this source of flooding.

4.2 Environment Agency Flood Map

4.2.1 A review of the Environment Agency's flood map indicates that the entire site and local area is located outside the 1 in 1000 annual probability of river flooding in any year (<0.1% AEP).

4.2.2 The 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, because these can be breached, overtopped and may not be in existence for the lifetime of the development.

4.2.3 The Environment Agency Flood Zones and acceptable development types are explained in Table 4.2. All development types are generally deemed acceptable in terms of flood risk in Flood Zone 1.

4.2.4 In the supporting PPG ID: 7 to the NPPF (Table 1) appropriate uses have been identified for the Flood Zones. Applying the Flood Risk Vulnerability Classification in Table 2 and 3 of the supporting PPG ID: 7 to the NPPF, the proposed development is mostly classified as 'less vulnerable'. The drinking establishment planned for the site will be classified as 'more vulnerable' with reference to PPG ID: 7, Table 1.

4.2.5 Due to the development being proposed to occur within Flood Zone 1, the Sequential Test Exception Test will not be required.

Table 4.2: 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 has to be 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.*

Table 4.3: Flood Risk Vulnerability and Flood Zone 'Compatibility' as identified in Table 3 of the supporting PPG ID: 7 to the NPPF

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.*

4.3 Historic Flooding

4.3.1 No SFRA historical flood outlines are recorded in the area of the proposed development.

4.3.2 The Environment Agency and Barnsley Metropolitan Council hold no records of flooding for the site (see Appendix 3 and 5).

4.3.3 The British Hydrological Society "Chronology of British Hydrological Event[6]" has no records of flooding in the immediate area. No other historical records of flooding for the site have been recorded.

4.4 Existing Flood Defence Measures

4.4.1 The Environment Agency flood map and initial correspondence confirms that the site is not protected by flood defence measures (Appendix 3).

4.5 Current Flood Risk

4.5.1 The site is located within Flood Zone 1 and is at 'low risk' of fluvial flooding.

4.5.2 Secondary flooding sources identified within the site includes:

- Groundwater flooding;
- Overland Flow flooding; and
- Flooding from Artificial Drainage.

4.5.3 The secondary flooding sources identified above will be dealt with by an adequately designed drainage system, and these sources would only inundate the site to a relatively low water depth and water velocity, will only last a short period of time, in very extreme cases and will not have an impact on the whole of the proposed development site.

4.5.4 It is recommended that a precautionary approach is taken whereby finished flood levels are located a minimum of +150mm above external levels to mitigate secondary flooding sources.

4.5.5 As noted in Section 4.2, the section of the site where development is proposed has a 'low probability' of fluvial flooding as the majority of the site is located within Flood Zone 1; outside the extent of the 1 in 1000 year annual probability of the fluvial flooding (<0.1 % AEP).

4.5.6 The proposed development is classified as 'less vulnerable and more vulnerable', owing to the mixed use of the site. Less and more vulnerable uses are appropriate within Flood Zones 1, 2 and 3 after the completion of a satisfactory FRA. All development is, however, appropriate within Flood Zone 1.

[6] http://www.dundee.ac.uk/geography/cbhe/

5.0 Site Drainage

5.1 Surface Water Drainage

5.1.1 It is recognised that consideration of flood issues should not be confined to the floodplain. The alteration of natural surface water flow patterns through developments can lead to problems elsewhere in the catchment, particularly flooding downstream. For example, replacing vegetated areas with roofs, roads and other paved areas can increase both the total and the peak flow of surface water runoff from the development site. Changes of land use on previously developed land can also have significant downstream impacts where the existing drainage system may not have sufficient capacity for the additional drainage. This section considers the existing drainage system at the application site and potential impacts resulting from the development.

5.1.2 A surface water management strategy for the development will be required to manage and reduce the flood risk posed by the 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.

5.1.3 There are three possible options to discharge the surface water runoff in accordance with requirement H3 of the Building Regulations 2010[7]. Rainwater shall discharge to one of the following, listed in order of priority:

- An adequate soakaway or some other adequate infiltration system; or, where that is not reasonably practicable;
- A watercourse; or where that is not reasonably practicable;
- A sewer.

5.1.4 An assessment of the surface water runoff rates has been undertaken, in order to determine the surface water options and attenuation requirements for the site. The assessment considers the impact of the site compared to current conditions. Therefore, the surface water attenuation requirement for the developed site can be determined and reviewed against existing arrangements.

5.1.5 The surface water drainage arrangements for any development site should be such that the volumes 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.

5.2 Existing Drainage System

5.2.1 The development site is approximately 3.35 hectares (ha) in area and is currently reclaimed vegetated brownfield land and is entirely permeable.

5.2.2 Yorkshire Water reported there are sewer assets located within the site along the western boundary (see Appendix 4).

5.2.3 A Ø225mm public combined sewer enters the site near to the central western corner of the site flowing in a southerly direction along the western boundary of the site. The asset exits the site shortly before reaching the southernmost corner of the site to the west passing across the southern end of the adjacent Highways Agency depot and routing along Moor Lane in a

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

south-westerly direction towards the M1 Motorway. A further Ø225mm public combined sewer enters the site on the western boundary flowing in an easterly direction and meets at a manhole junction with the asset flowing into the site from the north just inside the western boundary.

5.2.4 Outside the boundary to the north of the site is a Ø225-300mm Public Surface Water Sewer routing flows from the residential estate to the north of the site away to the north.

5.3 Current Runoff Rate

5.3.1 As noted above, the 3.35 ha site is entirely permeable. It is assumed that all rainfall currently infiltrates into the ground, evaporates from the surface or occurs as overland flow at source routed towards to the northern boundary of the site. This is considered feasible given the soils which underlay the site.

5.3.2 The site is situated near to large areas of poor permeability or areas with the geology and/or topography which may result in overland flow flooding as stated in para 4.1.12. BGS Geological maps[8] show that the geology below the site is identified as the Haigh Moor Sandstone formation. Further information regarding the geological and superficial composition of the underlying ground at the site can be obtained by reviewing the Phase I Environmental Desk Study and Mining Report (SHF.1122.002.GE.R.001) which also accompanies the planning application.

5.3.3 Based on the above, there are proponents for excessive runoff (e.g. infiltration/saturation excess overland flow) from the site.

5.3.4 The greenfield runoff rate for the site has been calculated at 5.3 l/s. It is proposed that, considering the capacity of the existing surface water sewer assets described in para 5.2.4, a maximum discharge rate of 5 l/s for a greenfield site will used.

5.4 Proposed Development

5.4.1 It is understood the proposals are for the construction of a multi-function development with office buildings, industrial units, petrol filling station, hotel, restaurant, drinking establishment, café, associated parking and landscaped areas.

5.4.2 Based on Ordnance Survey mapping and the proposed site layouts for the developed section will be approximately 74% impermeable (2.47ha). Current site layouts show that the proposed development will increase the impermeable area by approximately 74% (2.47ha) when compared to the existing condition.

Table 5.1: Impermeable Area for area of site with proposed constructed development

	Existing Buildings and Hardstanding	Proposed Buildings and Hardstanding	Difference
Area (Ha)	0.00	2.47	+2.47
Percentage of Total Site Area (%)	0	74	+74

[8] http://mapapps.bgs.ac.uk/geologyofbritain/home.html

5.4.3 Based on the above it has been shown that the proposed development will increase the overall areas of impermeable surfaces, and that methods to attenuate an increase in surface runoff will need to be introduced.

5.5 Post-Development Runoff Rate

5.5.1 A small proportion of landscaped areas will be incorporated into the layout of the site. This will make a small contribution in reducing the amount of surface runoff from the site.

5.5.2 Conditions will result in the rainfall discharging as surface water runoff from the site which will need to be controlled, treated, managed and mitigated.

5.6 Developed Site Drainage

5.6.1 An assessment of the surface water runoff rates has been undertaken, in order to determine the surface water options and attenuation requirements for the site. The assessment considers the impact of the site compared to current conditions. Therefore, the surface water attenuation requirement for the developed site can be determined and reviewed against existing arrangements.

5.6.2 In order to quantify any potential increase in surface water runoff, the existing greenfield runoff rate from the site must initially be determined. The rates of runoff have been determined using the current 'industry best practice' guidelines as outlined in the Interim Code of Practice for SuDS[9]. The recommended methodology for sites up to 50 hectares in area is the ICP SuDS method.

5.6.3 This has been compared in Table 5.3 and 5.4, to the estimated rate of surface water runoff from the developed site, also calculated using the ICP SuDS method. The following parameters have been incorporated into the runoff calculations:

- Catchment Area: 3.35ha (based on Layout Plan);
- Average Annual Rainfall (SAAR): 709mm/year;
- Soil: 0.300;
- Impermeable Areas:
  - Greenfield = 0% (0.00ha)
  - Pre-Application = 0% (0.00 ha)
  - Post-application = 74% (2.47ha)
- Region No.: 3

5.6.4 In order to represent the change in runoff at the site as a result of the proposed development, and to ascertain the required attenuation volumes, the urban 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.

5.6.5 Tables 5.2 below shows a comparison of surface water runoff rates pre and post-application, which indicates that the proposed development of the application site would result in an increase in surface water runoff rates. Extracts from WinDes have been included within Appendix 7.

[9] Office of the Deputy Prime Minister, National SuDS Working Group, July 2004, Interim Code of Practice for sustainable drainage systems.

5.6.6 The measures detailed in Section 5.7 and 5.8 will control the surface water runoff from the site and therefore surface water flood risk from the developed site.

Table 5.2: Changes in Proposed Developed Site Section Runoff Characteristics

Annual Probability (Return Period, years)	Greenfield/Pre-development Runoff Rate (l/s)	Post-application Runoff (l/s)	Difference (l/s)
100% (1)	5.3	17.0	11.7
3.33% (30)	10.9	30.0	19.1
1% (100)	12.9	32.0	19.1
1% + Climate Change	15.5	38.4	22.9

Note: *20% added to the data to account for long-term climate change as stated in the supporting PPG ID: 7 to the NPPF. The 2 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.*

5.7 Sustainable Drainage Options (SuDS)

5.7.1 Sustainable water management measures should be used to control the surface water runoff from the proposed development site therefore, managing the flood risk to the site and surrounding areas from surface water runoff.

5.7.2 Current guidance promotes sustainable water management through the use of SuDS. SuDS options include:

- Green roofs
- Water butts
- Permeable paving
- Rainwater harvesting
- Filter strips
- Wetland Areas
- Infiltration basins
- Detention basins
- Oversized pipes
- Brown roofs
- Swales
- Cellular Storage

5.7.3 A hierarchy of techniques is identified[10]:

1. **Prevention** – the use of good site design and housekeeping measures on individual sites to prevent runoff and pollution (e.g. minimise areas of hard standing).
2. **Source Control** – control of runoff at or very near its source (such as the use of rainwater harvesting).
3. **Site Control** – management of water from several sub-catchments (including routing water from roofs and car parks to one/several large soakaways for the whole site).
4. **Regional Control** – management of runoff from several sites, typically in a detention pond or wetland.

5.7.4 It is generally accepted that the implementation of SuDS as opposed to conventional drainage systems, provides several benefits by:

[10] CIRIA (2004) Report C609, Sustainable Drainage Systems – Hydraulic, Structural and Water Quality advice.

- reducing peak flows to watercourses or sewers and potentially reducing the risk of flooding downstream;
- reducing the volumes and frequency of water flowing directly to watercourses or sewers from developed sites;
- improving water quality over conventional surface water sewers by removing pollutants from diffuse pollutant sources;
- reducing potable water demand through rainwater harvesting;
- improving amenity through the provision of public open spaces and wildlife habitat; and
- replicating natural drainage patterns, including the recharge of groundwater so that base flows are maintained.

5.8 Feasibility of SuDS Options

5.8.1 As highlighted earlier in para 5.3.2, the soils and underlying geology would likely result in poor infiltration rates within the site.

5.8.2 Furthermore, BGS Hydrogeological maps[11] shows that the geology underlying the site is identified as the Pennine Middle Coal Measures Formation; a moderately productive secondary A aquifer with moderate yields.

5.8.3 Based on the desk study and a review of the geological conditions of the site no superficial materials have been recorded for the site and the solid geology comprises of mudstones, siltstone and sandstone which are likely to weather up to clay at the surface. Based on this it is unlikely that soakaways will work.

5.8.4 In light of the presence of coal workings beneath the site, the addition of soakaway waters into the potential workings is not recommended to avoid ground instability.

5.8.5 Based on the contamination of the surrounding areas from gas works and former coal workings, the disposal of surface water runoff into underlying aquifers in the vicinity of the site is not recommended.

5.8.6 Based on the above, the permeability of the site is likely to be poor and the use of infiltration SuDS would be unlikely.

5.8.7 In light of this, it is proposed that runoff from building roofs, car parking areas and access roads on the site will be routed to cellular storage allowing a controlled release.

5.8.8 It is possible to locate the attenuation facility in the northern section of the site as depicted in Drawing 7.

5.9 Surface Water Management Strategy

5.9.1 A surface water management strategy for the proposed development has been developed as part of a FRA to manage and reduce the flood risk posed by the surface water runoff from the site.

5.9.2 A surface water management strategy for the proposed development will manage and reduce the flood risk posed by the surface water runoff from the site.

[11]Geology of Britain viewer at http://mapapps.bgs.ac.uk/hydrogeologymap/hydromap.html

5.9.3 At this stage it is envisaged that the use of SuDS features will not be used within this development.

5.9.4 Landscaped areas within the site will be limited associated with the peripheries of the site boundary and dividing areas for car parking bays.

5.9.5 It is anticipated that the main attenuation storage would be provided by oversized pipes and cellular storage. It is recommended that interceptors should be fitted on the upstream side of attenuation storage devices in order to improve the quality of surface water discharging from the site. This is also to prevent any contaminants from facilities on site (i.e. the filling station) from reaching surface waters inadvertently. The filling station will have its own surface water management system to prevent an environmental incident should a major spill occur.

5.9.6 All events up to and including the 1 in 100 year (+30%) rainfall event will be attenuated. During detailed design the system could be designed to attenuate to the 1 in 1, 1 in 30 and 1 in 100 year events, in accordance with the Interim Code of Practice for SuDS.

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

5.9.8 At this stage of the planning process it is proposed that a planning condition can be adopted to cover the detailed design of the surface water runoff from the site. It is proposed that the detailed drainage design of the final scheme would be secured by a planning condition attached to any planning permission granted and agreed with the Environment Agency, Yorkshire Water and the LPA prior to works commencing.

5.9.9 Discussions have already taken place with Yorkshire Water and a discharge point to an existing surface water sewer to the north of the site has been provisionally agreed. This followed discussions related to the unsuitable ground on site due to contamination, soil and geology conditions which would prevent the use of infiltration SuDS systems to wholly deal with surface water runoff on site. There are no watercourses local to the site that could not be reached without the construction of an additional sewer.

5.9.10 Therefore the surface water sewer asset to the north is the only viable option. Flows from the site will be attenuated to ensure maximum flows of 5 l/s from the sites drainage system occur. Attenuation facilities will be situated in the north of the site where space is adequate for their installation and would also allow a positive drainage system to be installed with use of the northerly sloping topography.

5.9.11 The adoption of a surface water management strategy for the site represents an enhancement from the current conditions as the current surface water runoff from the site is uncontrolled, untreated, unmanaged and unmitigated.

Attenuation Requirement

5.9.12 The attenuation volume required to reduce the post-application surface water runoff from the site to the existing greenfield (100% AEP) runoff rate has been calculated. This is an outline design volume following the precautionary principal, and a more complex drainage control discharging at the 12 month, 30yr and 100yr runoff rates could be adopted within the detailed design.

5.9.13 The system was modelled within WinDes as a geocellular storage device where no infiltration can occur. The WinDes calculation extracts are included within Appendix 7.

5.9.14 The constructed section of the site is approximately 3.35ha in area and is currently entirely vegetated reclaimed land. The attenuation volume required reducing the post-application surface water runoff assuming total attenuation of all flow has been calculated. This is up to the 100 year (+30%) rainfall event.

5.9.15 The following input parameters were assumed in the calculations:

- Impermeable Area: 2.47ha (74%);
- Cv (proportion of rainfall forming surface water runoff): 75% summer, 84% winter;
- Assuming infiltration losses: 0.00 m/hour.

5.9.16 As prescribed within Building Regulations, surface water should be stored within the formal drainage system for the 30 year storm event. Where all surface water runoff is attenuated on site, approximately 1946m^3 of formal storage will be provided by the drainage system.

5.9.17 Storage should be provided on site for surface water In excess of the 1 in 30 year event, up to the 1 in 100 year plus 20% climate change event assuming no runoff. This has been calculated to be 1139m^3. Attenuation storage could be provided above and/or below ground. It is likely that oversized pipes or geocellular modules would be used within this development below parking areas to accommodate surface water storage.

5.9.18 An approximate total volume of 3085m^3 of storage will be required on site up to the 100 year (+20%) rainfall event.

5.9.19 A summary of the flow restrictions and attenuation volumes is provided in Table 5.3 below.

Table 5.3: Flow Restrictions/Attenuation Volumes – Without Infiltration

Total Constructed Development Site Area (Ha)	Estimated Impermeable Area (Ha)	Flow Restriction (l/s)	M30 Volume of Storage (m^3)	M100+20%CC Volume of Storage (m^3)
2.99	2.18	5.0	1946	3085

5.9.20 It should be noted that the above runoff rates and attenuation volumes are indicative only and should be investigated further during detailed design stage.

5.9.21 Discussions have been held with Yorkshire Water following the requisition of capacity data for the existing surface water sewer assets in the vicinity of the site (Appendix 4). Confirmation from John Wellham at Yorkshire was received on 21st October 2014 stating that the proposed surface water connection point identified in Drawing 7 is a feasible option and agreed in principle with maximum flows to this asset to be set at 5 l/s.

5.10 Foul Drainage

5.10.1 The proposed development will create foul flows from the site, and it is anticipated that these foul flows will be discharged to the existing public combined sewer flowing south along the western boundary of the site before routings flows to the west in the direction of the M1 Motorway.

5.10.2 Peak foul flows from the proposed development are summarised below in Table 5.5. The foul flow rates below are indicative only and should be established at detailed design. The

daily flows in litres per person of each unit (l/p/d) have been established with use of the British Water flows and loads guidance[12].

5.10.3 The number of people assigned to each unit has been determined by the number of parking spaces assigned to each unit in the plans provided in Appendix 1.

Table 5.5: Anticipated Foul Flows

Unit type/quantity	Peak flow (l/p/d)	No. of people	Total flow per unit per day (l)
Storage (x2)	50	6	300
Business Offices (x 4)	50	73	3650
Public House/Restaurant (x 1)	25	70	1750
Fast Food Restaurant (x 1)	12	60	720
Industrial unit (x 2)	50	73	3650
Hotel (x 80 beds)	250	50	12500
Filling Station (x 1)	50	10	500
Development total flow per day (l)			23070
Peak flow (l/s)			0.27

Based on table 5.5 above, a maximum flow of 0.27 l/s of foul flow can be anticipated to be discharged from the proposed development on the assumption a single parking space is equivalent to a single person present at each described unit type in Table 5.5.

Site Drainage Summary

5.10.4 It has been demonstrated that both surface water and foul flows from the site can be managed such that flood risk to and from the site following development is not increased.

[12] British Water Code of Practice, Flows and Loads – 3. Sizing Criteria, Treatment Capacity for Sewage Treatment Systems, 2009.

6.0 Summary and Conclusions

6.1 Introduction

6.1.1 This report presents an FRA, in accordance with the NPPF, for outline planning application for the for the construction of an employment led mixed use scheme that comprises of Business Offices (B1), Food & Drink (A3/A4), Employment Uses (B2), Hotel (C1) and Petrol Filling Station (Sui Generis) on land off the Dearne Valley Parkway (A6195), Rockingham Nr Birdwell, Barnsley, South Yorkshire, S70 5TT. This has included an assessment of the surface water drainage requirements of the site.

6.1.2 This report details the flood risk at the site and how this could be managed and mitigated to allow the site to be developed in support of the enclosed planning application. The proposed scale of development may present risks of flooding on-site and/or off-site if flooding is not effectively managed.

6.2 Assessment of Flood Risk

6.2.1 The FRA has demonstrated the following:

- The nearest 'Main River' is Blackburn Brook, 2.4km to the south-west of the site and thus will not affect the site. There are no 'Ordinary Watercourses' in the immediate vicinity of the site that will present a flood risk.
- The detailed flood map provided by the Environment Agency show that the site area where proposed construction will take place is located largely within Flood Zone 1; outside the extent of the 1 in 1000 annual probability of flooding / <0.1% AEP.
- In the supporting PPG ID: 7 to the appropriate uses have been identified for the Flood Zones. The proposed development is classified as 'less vulnerable'. All development types are generally deemed acceptable in terms of flood risk in Flood Zone 1. Based on the above, the Sequential Test should be passed and the Exception Test should not be required.
- Secondary flooding sources identified within the site includes:
  - Overland flow flooding;
  - Groundwater flooding; and
  - Flooding from artificial drainage.
- The secondary flooding sources identified above will be dealt with by an adequately designed drainage system, and these sources would only inundate the site to a relatively low water depth and water velocity, will only last a short period of time, in very extreme cases and will not have an impact on the whole of the proposed development site.
- Following a precautionary approach it is recommended that finished floor levels of any buildings are located a minimum of +150mm above external levels to mitigate secondary flooding sources.

6.2.2 Table 6.1 summarises the probability and consequence of flooding for the site with and without mitigation measures.

Table 6.1: Probability and consequences of all sources of flooding

Flooding Source	Potential Source	Probability	Consequence & Impact Without Mitigation	Consequence & Impact With Mitigation	Comment
Fluvial flooding	None	Low	Low	Negligible	Will not affect the site area
Tidal flooding	None	Negligible	Negligible	Negligible	None
Flooding from rising / high groundwater	Secondary A Aquifer	Low	Low	Negligible	No occupation of properties below ground level. Negligible impact with correct management (i.e. appropriated sized drainage system).
Overland flow flooding	Poor Permeability	Low-high	Low-high	Negligible	Negligible impact with correct management (i.e. appropriated sized drainage system).
Flooding from artificial drainage systems	Combined Sewer in the west of the site	Negligible	Negligible	Negligible	Will not affect the site area.
Flooding due to infrastructure failure	None	Negligible	Negligible	Negligible	None

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

6.3 Site Drainage

Surface Water

6.3.1 In addition, the FRA has considered the potential impact of the development on surface water runoff rates.

6.3.2 The surface water management strategy for the proposed development will manage and reduce the flood risk posed by the surface water runoff from the site.

6.3.3 The site area is approximately 3.35 ha in area and is currently vegetated reclaimed land and entirely permeable. The attenuation volume required to reduce the post-application surface water runoff from the site (constructed development) has been calculated, and is detailed below.

6.3.4 During detailed design the system could be designed to attenuate to the 12 month, 1 in 30 and 1 in 100 year events. Tables 6.2 below summarises the 1 in 30 year formal drainage

volume and the attenuation volume to accommodate surface water between the 1 in 30 and 1 in 100 (+20%CC).

Table 6.2: Summary of Attenuation Volumes

M30 Volume of Formal Storage (m^3)	M100+20%CC Volume of Storage (m^3)	M30 to M100+30%CC Volume of Storage (m^3)
1946	3085	1139

Foul Water

6.3.5 For the proposed development, the peak foul flows from the site have been calculated to be approximately 0.27 l/s.

6.3.6 It is proposed that the foul flow will discharge to the existing public foul sewer located on the western site boundary.

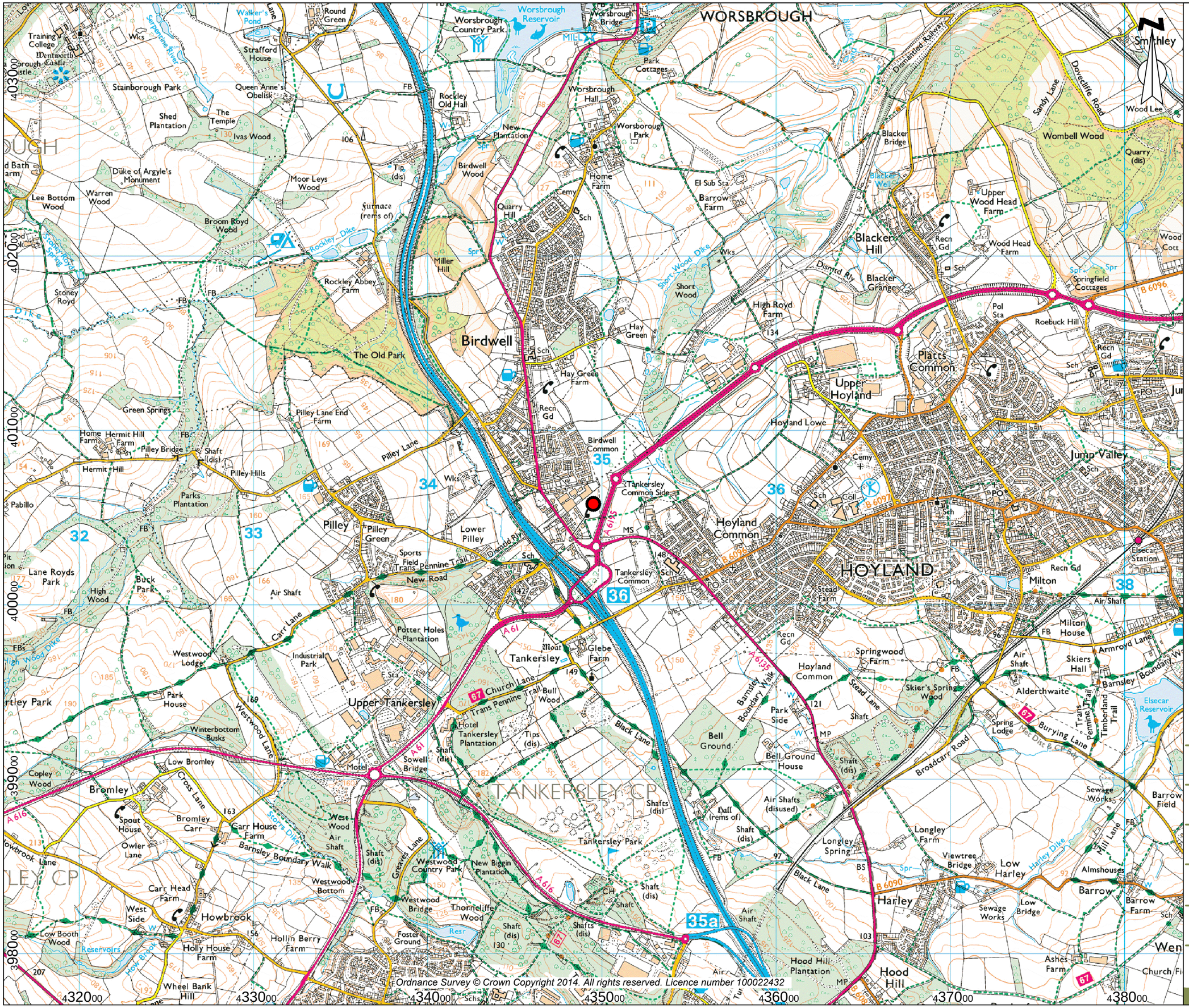
Site Drainage Summary

6.3.7 It has been shown that both surface water and foul flows from the site can be managed such that flood risk to and from the site following the proposed development is not increased.

6.4 Conclusion

6.4.1 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 the NPPF and PPG.

6.4.2 The development should not therefore be precluded on the grounds of flood risk.



Key

Site Location
(SE 3495 0056)

enzygo
environmental consultants
STEP Business Centre, Wortley Rd, Sheffield, S36 2UH

CLIENT: Hartwood Estates

SCALE: 1:20,000@A3

PROJECT REF: SHF.1122.002.D.001.B

DRAWN: MG

CHECKED: DA

DATE: Mar 2015

PROJECT: Rockingham, Birdwell

TITLE: Site Location Plan

DRAWING NO: 1

Key

Site Boundary

Surface Water Features

enzygo
environmental consultants

STEP Business Centre, Wortley Rd, Sheffield, S36 2UH

CLIENT: Hartwood Estates

SCALE: 1:5,000@A3

PROJECT REF: SHF.1122.002.D.002.B

DRAWN: MG

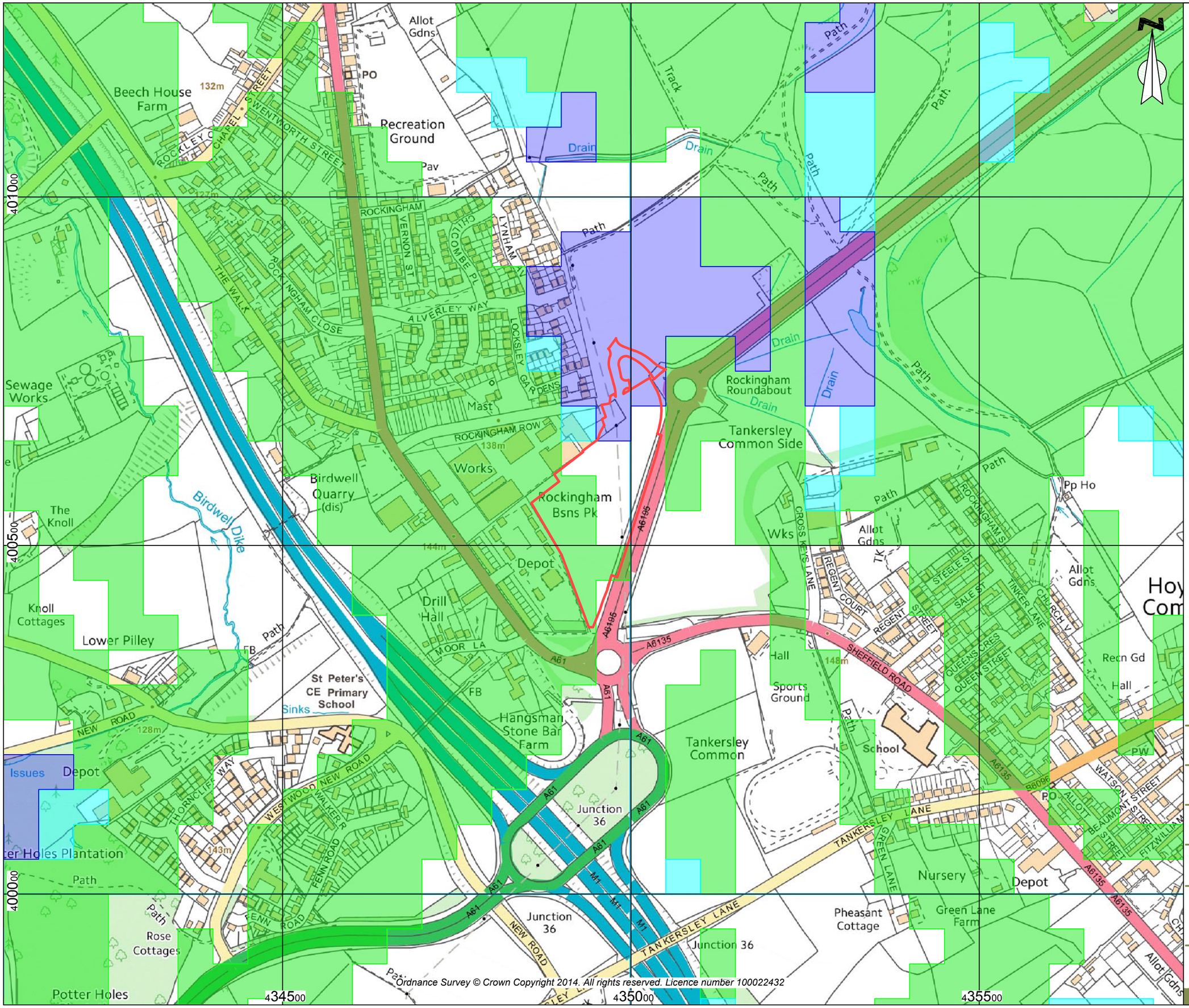
CHECKED: DA

DATE: Mar 2015

PROJECT: Rockingham, Birdwell

TITLE: Surface Water Features

DRAWING NO: 2



Key

- Site Boundary
- Potential for Groundwater Flooding to Occur at Surface
- Potential for Groundwater Flooding of Property Situated Below Ground Level
- Limited Potential for Groundwater Flooding to Occur

enzygo
environmental consultants
STEP Business Centre, Wortley Rd, Sheffield, S36 2UH

CLIENT: Hartwood Estates

SCALE: 1:5,000@A3

PROJECT REF: SHF.1122.002.D.003.B

DRAWN: MG

CHECKED: DA

DATE: Mar 2015

PROJECT: Rockingham, Birdwell

TITLE: BGS Groundwater Flooding Susceptibility

DRAWING NO: 3

Key

- Site Boundary
- Search Extent
- 1 in 75 Year Surface Water Flooding
- 1 in 200 Year Surface Water Flooding
- 1 in 1000 Year Surface Water Flooding

enzygo
environmental consultants
STEP Business Centre, Wortley Rd, Sheffield, S36 2UH

CLIENT: Hartwood Estates

SCALE: 1:5,000@A3

PROJECT REF: SHF.1122.002.D.004.B

DRAWN: MG

CHECKED: DA

DATE: Mar 2015

PROJECT: Rockingham, Birdwell

TITLE: JBA Surface Water Flooding

DRAWING NO: 4

Key

- Site Boundary
- Flood Zone 3
- Flood Zone 2
- Flood Zone 1

enzygo
environmental consultants
STEP Business Centre, Wortley Rd, Sheffield, S36 2UH

CLIENT: Hartwood Estates

SCALE: 1:10,000@A3

PROJECT REF: SHF.1122.002.D.005.B

DRAWN: MG

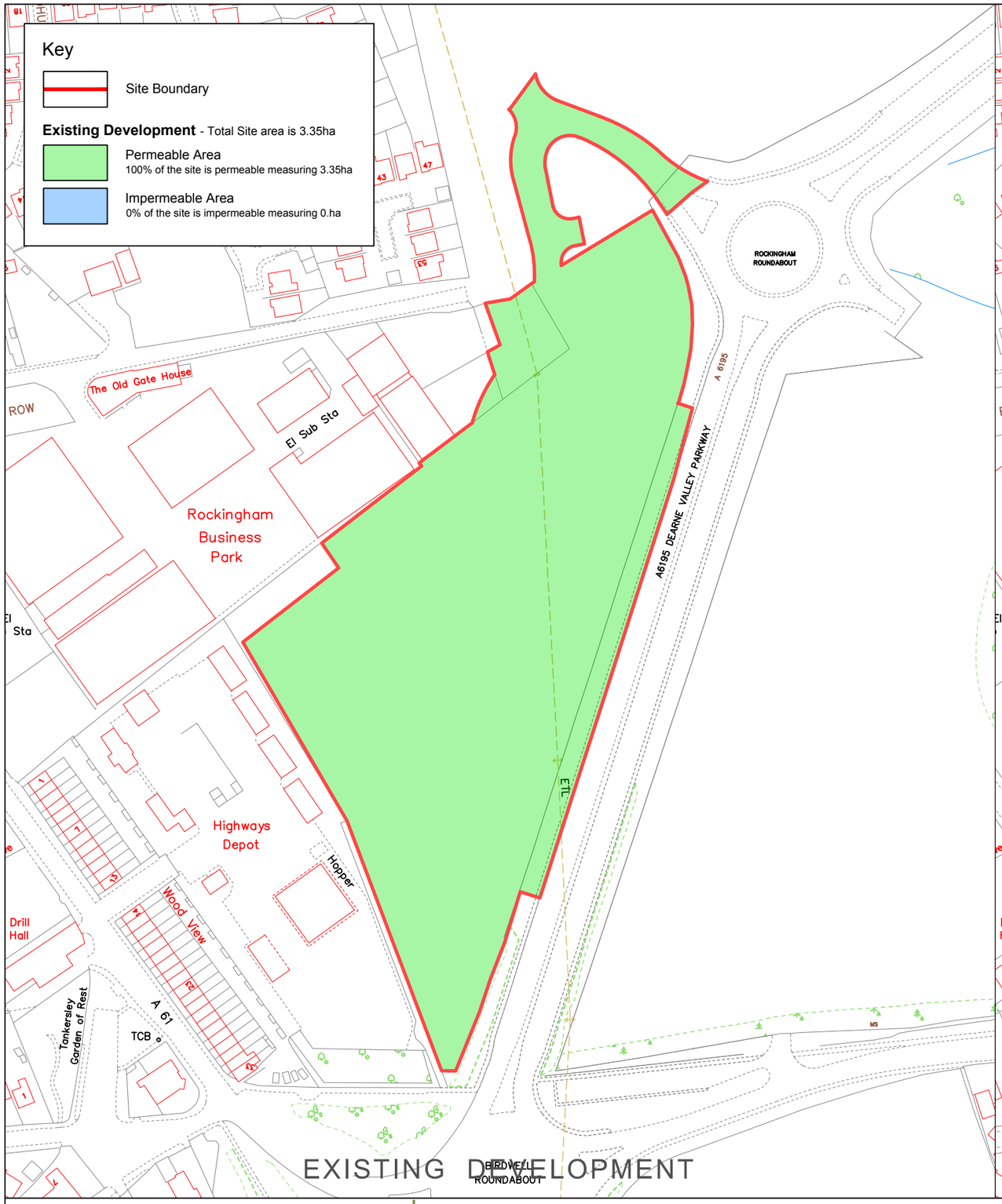
CHECKED: DA

DATE: Mar 2015

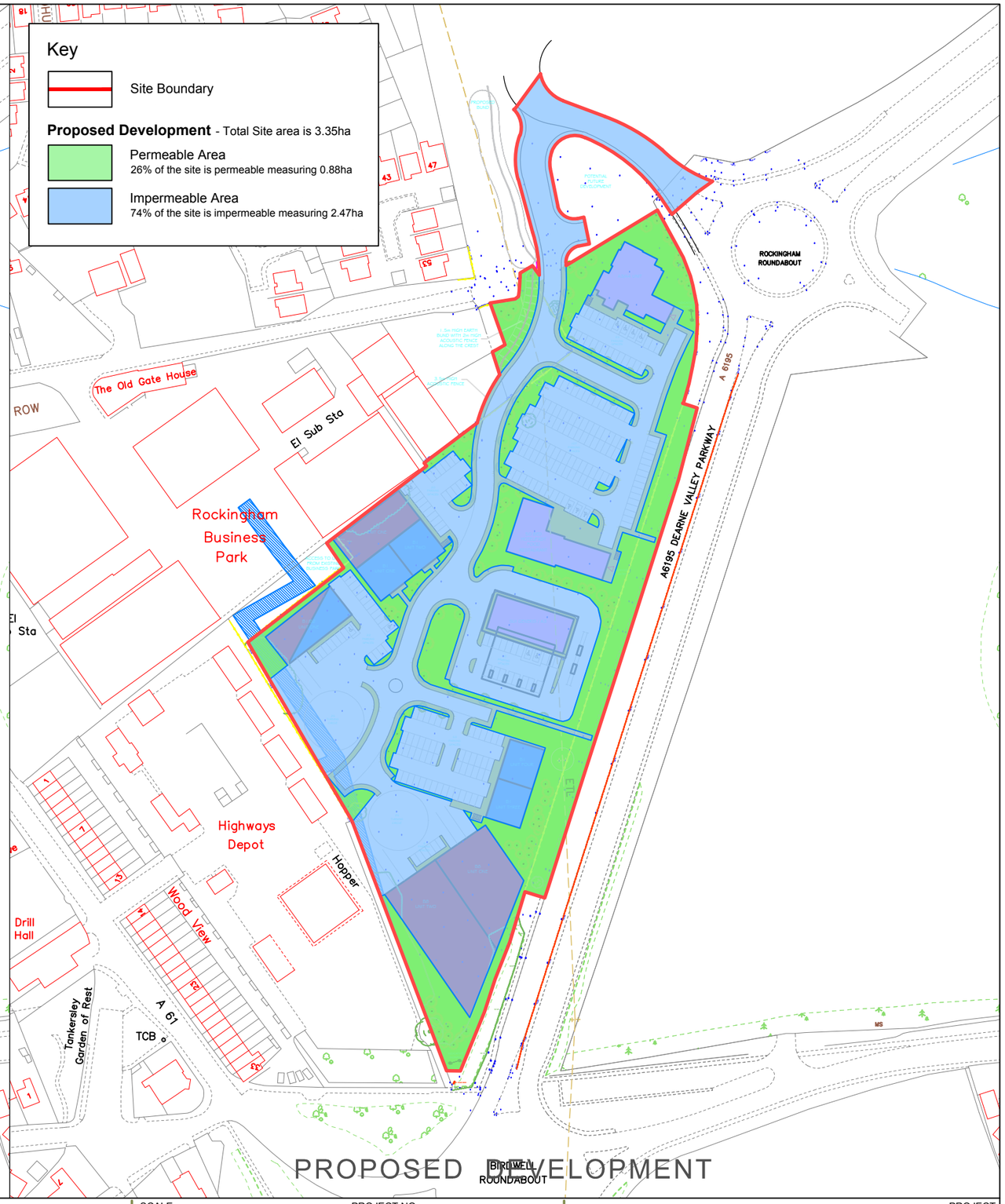
PROJECT: Rockingham, Birdwell

TITLE: Environment Agency Flood Zones

DRAWING NO: 5



EXISTING DEVELOPMENT



PROPOSED DEVELOPMENT

enzygo
environmental consultants
STEP Business Centre, Wortley Rd, Sheffield, S36 2UH

SCALE	PROJECT NO.	PROJECT
1:2,000@A3	SHF.1122.002.D.006.B	Rockingham, Birdwell
DATE	DRAWING NO.	DRAWING TITLE
Mar 2015	6	Permeable and Impermeable Areas
DRAWN	CHECKED	CLIENT
MG	SD	Hartwood Estates

Discharge to Yorkshire Water
Surface Water Sewer at max 5 l/s

Indicative Storage Device
M30 to M100 (+30% for CC) indicative storage required, attenuation assuming no infiltration with outfall = 1139m³ (divided equally over 6 storage devices)

Via Pollution Interceptor

Indicative Storage Device
M30 to M100 (+30% for CC) indicative storage required, attenuation assuming no infiltration with outfall = 1139m³ (divided equally over 6 storage devices)

Key

- Site Boundary
- Proposed Surface Water Sewer
- Proposed Attenuation Location
- Combined Sewer
- Surface Water Sewer
- Foul Sewer
- Abandoned Sewer
- Private Sewer

enzygo
environmental consultants
STEP Business Centre, Wortley Rd, Sheffield, S36 2UH

CLIENT: Hartwood Estates

SCALE: 1:5,000@A3

PROJECT REF: SHF.1122.002.D.007

DRAWN: MG

CHECKED: SD

DATE: Mar 2015

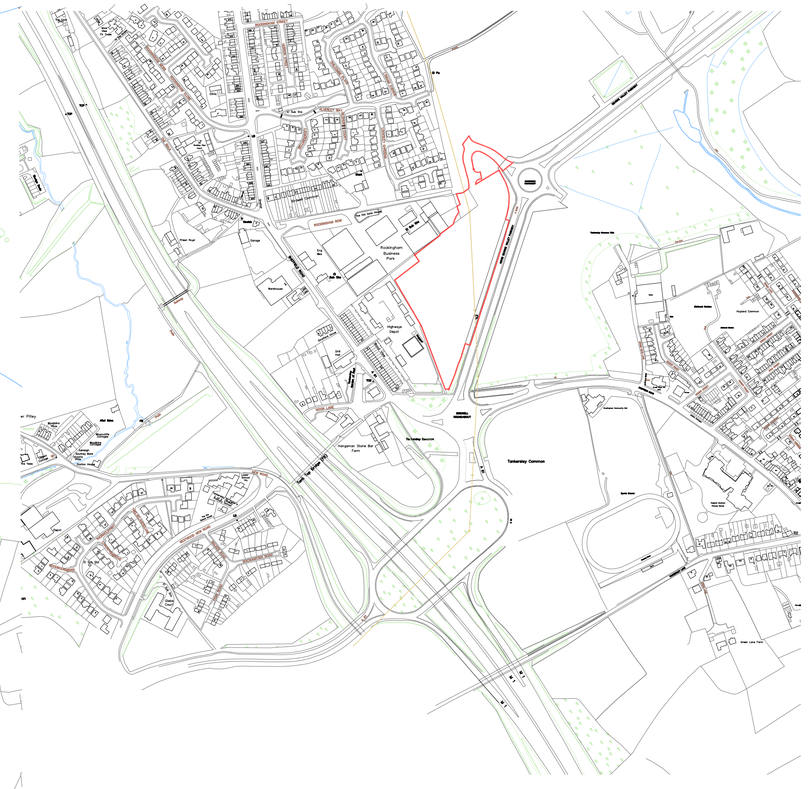
PROJECT: Rockingham, Birdwell

TITLE: Indicative Drainage Layout

DRAWING NO: 7

APPENDICES

Appendix 1 – Proposed Layout



LOCATION PLAN
SCALE: 1:5000

SCALE: 1:1000

KEY

- SITE BOUNDARY
- DRAINAGE EASEMENT
- A1-A4 CLASS USE (INCL)
- B8 CLASS USE
- B1 CLASS USE

Schedule				
Name	Total SqM	Total SqFt	Comments	Car Parking
RETAIL				
50 BED HOTEL/FAST FOOD RESTAURANT	1300 m²	14000 ft²	Two Storey Unit	60 spaces
A3 / A4 UNIT	600 m²	6450 ft²	Single Storey Unit	70 spaces
SUI GENERIS / A3 UNIT	500 m²	5380 ft²	Single Storey Unit	10 spaces
CLASS B2				
UNIT ONE	500 m²	5380 ft²	Single Storey Unit	N/A
CLASS B2/B1				
UNIT ONE	1000 m²	10760 ft²	Single Storey Unit	22 spaces
CLASS B1				
UNIT ONE	250 m²	2700 ft²	Two Storey Unit	10 spaces
UNIT TWO	250 m²	2700 ft²	Two Storey Unit	10 spaces
UNIT THREE	750 m²	8070 ft²	Two Storey Unit	27 spaces
UNIT FOUR	750 m²	8070 ft²	Two Storey Unit	26 spaces
CLASS B8				
UNIT ONE	927 m²	9980 ft²	Single Storey Unit	3 spaces
UNIT TWO	1360 m²	14630 ft²	Single Storey Unit	3 spaces

TOTAL RETAIL AREA	2400 m²
TOTAL B1,B2,B8	5787 m²
TOTAL FLOOR SPACE	8187 m²

Total Parking	241
6% Disabled Parking	12
Cycle Parking	24

REV	DATE	DESCRIPTION	BY	CHECK
C	MAR 15	ACOUSTIC BUND AND FENCE ADDED PEDESTRIAN ACCESS ACCOMMODATED	EW	VS
B	MAR 15	RED LINE AMENDED AND SIGNAGE POSITIONS INCLUDED	EW	AT
A	FEB 15	LAYOUT AND LAND USES REVISED	EW	VS

NORTH

jrp ARCHITECTURE | PLANNING | LANDSCAPE

CLIENT:
HARTWOOD ESTATES

PROJECT:
DEARNE VALLEY PARKWAY
SHEFFIELD ROAD

DRAWING:
OUTLINE MASTERPLAN

DRAWING NUMBER:
P13 4806 10

SCALE @ A1:
AS INDICATED

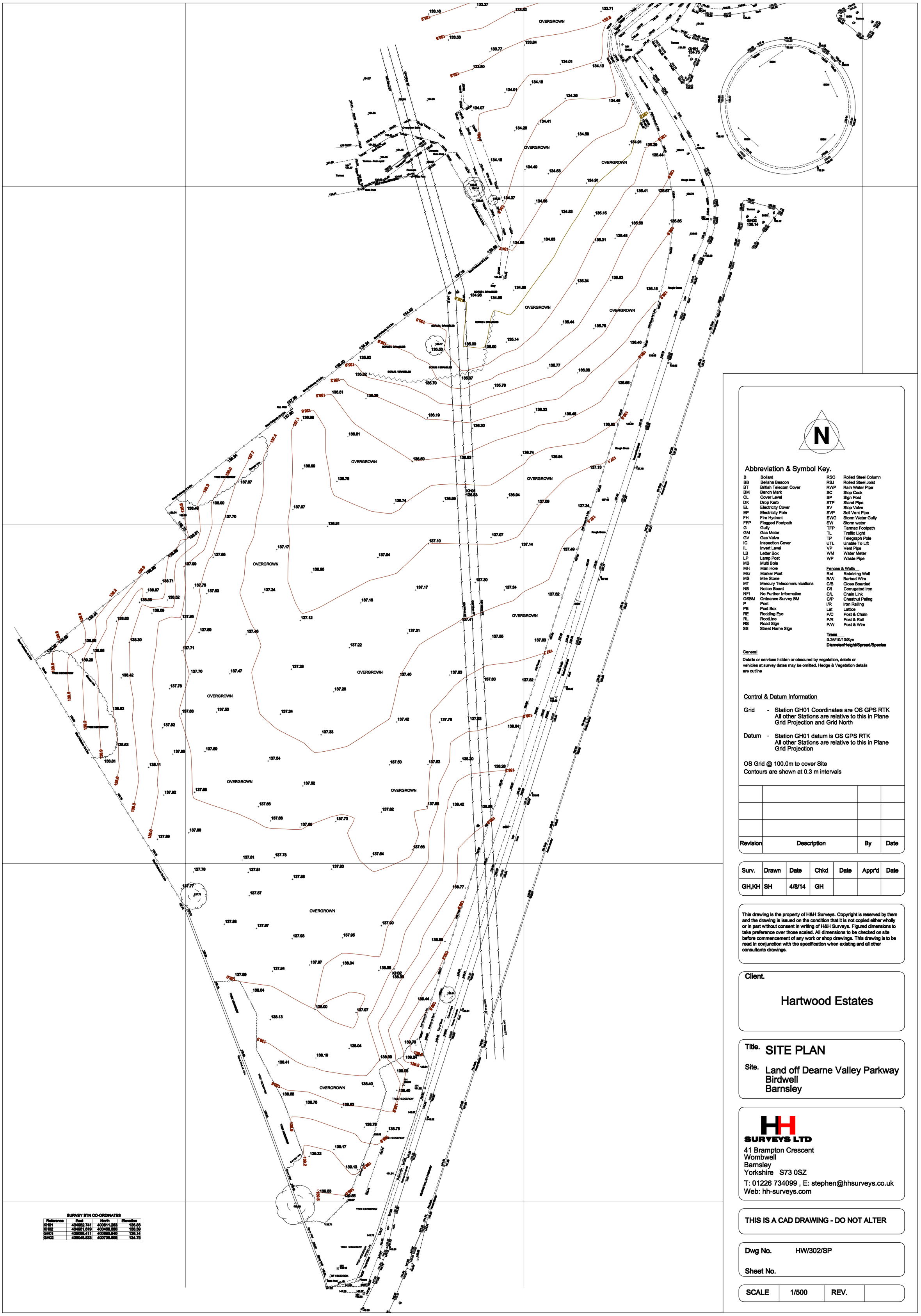
DRAWN: EW **DATE:** JAN 15

CHECKED: VS **DATE:** JAN 15

P13 4806 10 / OUTLINE MASTERPLAN

14 MARINER COURT / CALDER PARK / WAKEFIELD / WF4 3FL
01924 383322 / www.jrpassoc.co.uk / info@jrpassoc.co.uk
jrpassociates.llc a trading style of John R Pilley Associates Limited

Appendix 2 – Topographic Survey



SURVEY STN CO-ORDINATES

Reference	East	North	Elevation
KH01	434982.741	400611.283	136.83
KH02	434951.619	400468.860	136.39
GH01	435088.411	400690.940	136.14
GH02	435048.833	400738.605	134.75

N

Abbreviation & Symbol Key.

B	Bollard	RSC	Rolled Steel Column
BB	Belisha Beacon	RSJ	Rolled Steel Joist
BT	British Telecom Cover	RWP	Rain Water Pipe
BM	Bench Mark	SC	Stop Cock
CL	Cover Level	SP	Sign Post
DK	Drop Kerb	STP	Stand Pipe
EL	Electricity Cover	SV	Stop Valve
EP	Electricity Pole	SVP	Soil Vent Pipe
FH	Fire Hydrant	SWG	Storm Water Gully
FFP	Flagged Footpath	SW	Storm water
G	Gully	TFP	Tarmac Footpath
GM	Gas Meter	TL	Traffic Light
GV	Gas Valve	TP	Telegraph Pole
IC	Inspection Cover	UTL	Unable To Lift
IL	Invert Level	VP	Vent Pipe
LB	Letter Box	WM	Water Meter
LP	Lamp Post	WP	Waste Pipe
MB	Multi Bole		
MH	Man Hole		
Mkr	Marker Post		
MS	Mile Stone		
MT	Mercury Telecommunications		
NB	Notice Board		
NFI	No Further Information		
OSBM	Ordnance Survey BM		
P	Post		
PB	Post Box		
RE	Rodding Eye		
RL	RootLine		
RS	Road Sign		
SS	Street Name Sign		

Fences & Walls

Ret	Retaining Wall
B/W	Barbed Wire
C/B	Close Boarded
C/I	Corrugated Iron
C/L	Chain Link
C/P	Chestnut Paling
I/R	Iron Railing
Lat	Lattice
P/C	Post & Chain
P/R	Post & Rail
P/W	Post & Wire

Trees
0.25/10/10/Syc
Diameter/Height/Spread/Species

General

Details or services hidden or obscured by vegetation, debris or vehicles at survey dates may be omitted. Hedge & Vegetation details are outline

Control & Datum Information

Grid - Station GH01 Coordinates are OS GPS RTK
All other Stations are relative to this in Plane Grid Projection and Grid North

Datum - Station GH01 datum is OS GPS RTK
All other Stations are relative to this in Plane Grid Projection

OS Grid @ 100.0m to cover Site
Contours are shown at 0.3 m intervals

Revision	Description	By	Date

Surv.	Drawn	Date	Chkd	Date	Appr'd	Date
GH,KH	SH	4/8/14	GH			

Client.

Hartwood Estates

Title. SITE PLAN

Site. Land off Dearne Valley Parkway
Birdwell
Barnsley

HH SURVEYS LTD
41 Brampton Crescent
Wombwell
Barnsley
Yorkshire S73 0SZ
T: 01226 734099 , E: stephen@hhsurveys.co.uk
Web: hh-surveys.com

THIS IS A CAD DRAWING - DO NOT ALTER

Dwg No. HW/302/SP

Sheet No.

SCALE	1/500	REV.	

Appendix 3 – Environment Agency Correspondence

Your Enquiry: RFI/2014/29722

Beech, Cheryl <Cheryl.Beech@environment-agency.gov.uk>

Wed 16/07/2014 10:33

To: Scott Dawson <scottdawson@enzygo.com>;

— 4 attachments

Standard_Notice sept 2012.pdf; VAT Receipt.pdf; Flood Map.pdf; Surface Water Map.pdf;

Our Ref: RFI/2014/29722

Your Ref:

Dear Scott

RE: Birdwell, Barnsley S70 5TT

Thank you for your request of 18 June 2014 to use Environment Agency data, in the development of the above site. The information is attached.

If you have requested this information to help inform a development proposal, then you should note the detail in the attached advisory text on the use of Environment Agency Information for Flood Risk Assessments.

Supporting Information

The Flood Map

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

What is the Flood Map?

The Flood Map 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 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

To the best of our knowledge there is no known flood history for this site. For local drainage information please contact your water utility company and your local council.

Water causing flooding can come from different places, for example from rivers or the sea; surface water (i.e. rainwater flowing over or accumulating on the ground before it is able to enter rivers or the drainage system); overflowing or backing up of sewers or drainage systems which have been overwhelmed or from groundwater rising up from underground aquifers.

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

There are no flood defences helping to reduce flood risk in your area of interest.

Modelling

We do not have any modelling information at this location.

River

Non Main River

The watercourse near this location is not designated as Main River. It is classed as an Ordinary Watercourse. The local authority holds responsibility for the maintenance of this river. The Environment Agency does not have any more information available in regard to

past flooding issues or current flood risk. For any information on any past flooding and for any record of the impact of local drainage on that watercourse we suggest you speak to your City Council Drainage Section and to Yorkshire Water.

Surface Water Map

Risk of flooding from surface water information for Land of Dearne Valley Parkway, Birdwell, Barnsley.

Thank you for your enquiry dated 24th June 2014 regarding the above location.

Enclosed is a map of showing the risk of flooding from surface water for this area, produced in partnership with Local Authorities.

Surface water flood risk is widely distributed and can happen far from rivers and the sea. It's sometimes hard to say whether you're in an area at risk of flooding from surface water because surface water flooding can follow many more paths and can be affected by very small features such as kerb height and even speed bumps. We recommend you consider not only whether your property is shown in or near an area at risk, but also the broader scale and pattern of surface water flooding shown in your area. You may also wish to view this and other flood risk maps on our website.

Whether your property is at risk will depend on the accuracy of the mapping in this area, and on the details of your property – for example, how waterproof the structure is, the levels of doors and airbricks, and whether you have installed any flood resilience measures such as airbrick covers and flood boards.

If you require information on what is being done to manage surface water flood risk in your local area, please contact [insert LLFA name here].

Information Warning

Please note:

It is not possible to say for certain what the flood risk is but we use the best information available to provide an indication so that people can make informed choices about living with or managing the risks. The information we supply does not provide an indicator of flood risk at an individual property / site level.

The flood risk information provided on the attached map does not cover other sources of flooding such as from rivers and sea.

LIDAR Data

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.

To get a license for the data you will need to contact our Science Group, stating the area you are interested in (preferably an OS Grid Reference, or a map with the area outlined). There may be a charge for this data.

Low resolution Data is returned as an ASCII grid, which can easily be converted to a surface model for use in most GIS applications, and is provided in 2km x 2km tiles, at a resolution of 2m.

High resolution Data is also returned as an ASCII grid, in 0.5km x 0.5km tiles, at a resolution between 0.125 and 0.5m.

For current catalogue of coverage see: http://www.geomatics-group.co.uk/GeoCMS/order.aspx

To obtain the data and license agreement, please contact:

Environment Agency Geomatics
Phoenix House
Lower Bristol Road
Bath BA2 9ES

Tel: 01225 487658
Fax: 01225 487643

E-mail: archived-lidardata@environment-agency.gov.uk
Or visit the website at www.geomatics-group.co.uk

From the supplied location plan we confirm the site falls in flood zone 1 according to the Environment Agency Flood Map. We have no record of any watercourses on or abutting this area or are aware of any historical flooding at the site. However the site may be subject to flooding from a number of different sources (small or culverted watercourses, public sewers, highway drains, overland surface water flow). I would suggest that you contact the local authority main drainage department who may hold more detailed information for the site, and may be able to advise further.
We have no information on drainage within the site and in the local area, I would suggest you talk to the drainage engineer at Barnsley as mentioned above as they will have local knowledge of the area.

Surface Water Runoff

Surface water discharge from new development should ideally ‘mimic’ the pre-development situation using a sustainable drainage system so that flow in watercourses is not increased. In normal circumstances surface water discharge from new development should be attenuated to the ‘greenfield’ 1 in 1 year flow from site, or lower than the existing rate of runoff for a pre-developed site.

Greenfield sites

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.**

Brownfield sites

Surface water runoff should be attenuated to provide a minimum 30% reduction of surface water discharge when compared with the existing site outflow prior to redevelopment, unless otherwise agreed with the relevant drainage authority. If a new discharge is required to a watercourse should be limited to the acceptable greenfield runoff rate, also it must be ensured that any additional volume of surface water to the receiving watercourse will not cause flooding problems.

The attenuation system needs to be designed so there is no flooding to properties on or off site for rainfall events up to 1 in 100 year return period.

Any conventional adopted balancing facility should be designed to accommodate volume storage for at least the 1 in 30 year flow from the site below ground, with the 1 in 100 year flow retained within the site (including an allowance 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 Environment Agency where ground conditions are suitable.

Sustainable Urban Drainage techniques (SUDs) 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.
The Environment Agency seeks to promote the use of SUDs techniques to this site and expects the developer of the site to submit detailed investigations such that the use of SUDs has been fully explored.

More information on SUDs can be found at: http://www.ciria.org.uk/suds/

For information on Green Roofs in particular, please visit: www.thegreenroofcentre.co.uk

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.

You should seek your own expert advice in relation to technical matters relevant to any planning application before submission.

If you wish to discuss your plans further with the engineer dealing with the area Lesley Slaney can contacted on (0113) 8196044

Geological maps show that the site is underlain by the Haigh Moor Rock (sandstone) in the southwest and the Pennine Middle Coal Measures Formation (mudstone, siltstone and sandstone) in the northeast. These bedrock formations are designated Secondary A aquifers. Secondary A aquifers are aquifers that can provide modest amounts of water. They are important for rivers, wetlands and lakes and private water supplies in rural areas.

The site is not located in a groundwater Source Protection Zone.

We do not hold any information about land contamination at the site. The Local Authority may be able to provide information about historical land uses at the site.

Information about our approach to managing and protecting groundwater can be found in our publication Groundwater Protection: Principles and Practice (GP3), August 2013. Part 2

(G) of this document sets out our position statements with respect to the discharge of liquid effluents into the ground, including soakaways. A copy of this publication can be found on our website at the following address:

https://www.gov.uk/government/publications/groundwater-protection-principles-and-practice-gp3

I hope that we have correctly interpreted your request. Please see the attached Standard Notice or licence 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://feedback1.environmentagency.uk.com/s3/b85d5292267d

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

Yours sincerely

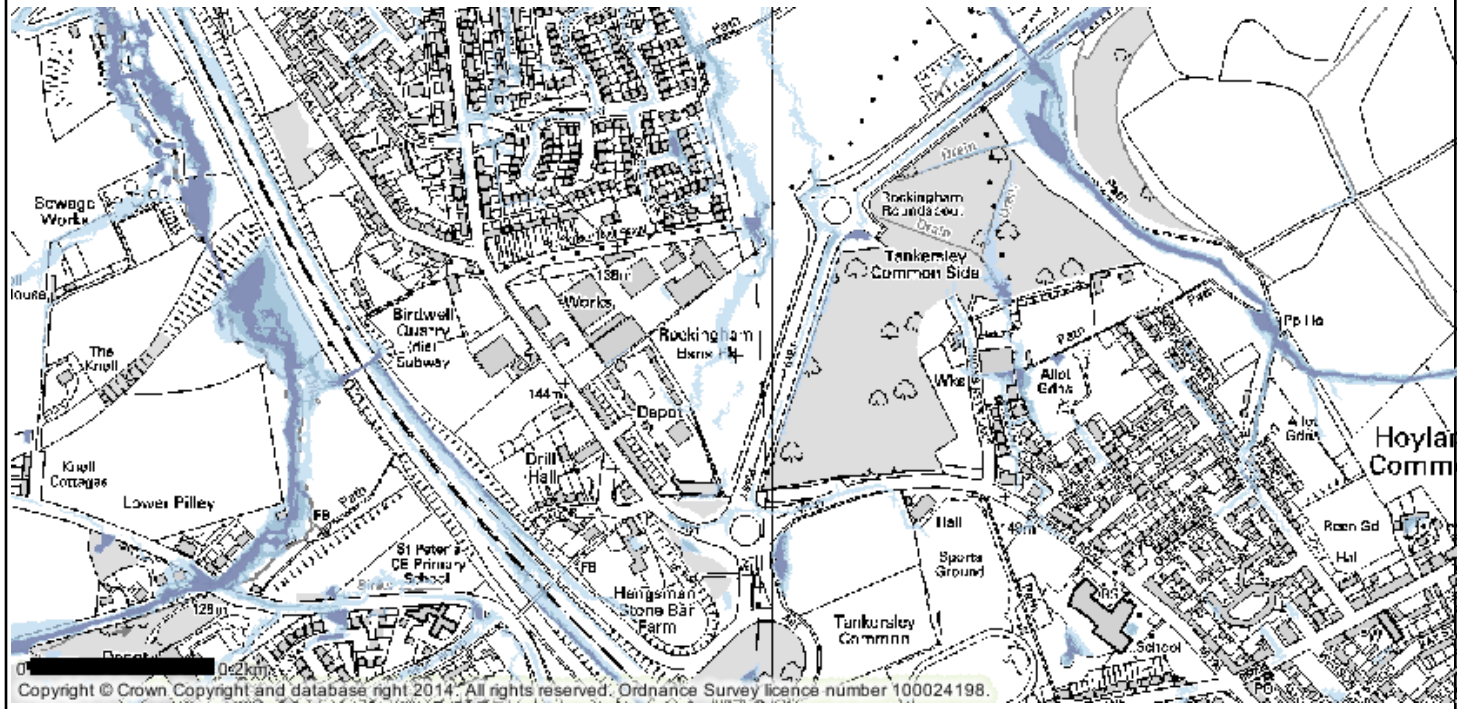
Cheryl Beech
Customers and Engagement Team
Direct Dial 0113 8196360
Email neyorkshire@environment-agency.gov.uk

Please note: I work part time - my usual working days are Tuesday, Wednesday & Thursday

Yorkshire Area
Environment Agency
Lateral
8 City Walk
Leeds
LS11 9AT

Did you know....?
We responded to **1704** Requests for Information during the first quarter of this year.
With your help we took an average of **8.57** days to respond to the customer.

Risk of flooding from Surface Water – Birdwell, Barnsley – RFI: 29722 – Date 17th July 2014



Environment Agency

N
W E
S

Likelihood of Flooding from Surface Water

- High
- Medium
- Low
- Very Low

Likelihood of Flooding from Surface Water

High:	Greater than or equal to 1 in 30 (3.3%) chance in any given year
Medium:	Less than 1 in 30 (3.3%) but greater than or equal to 1 in 100 (1%) chance in any given year
Low:	Less than 1 in 100 (1%) but greater than or equal to 1 in 1,000 (0.1%) chance in any given year
Very Low:	Less than 1 in 1,000 (0.1%) chance in any given year

This information is shown on the Risk of Flooding from Surface Water map on our website.

Contact Us: National Customer Contact Centre, PO Box 544, Rotherham, S60 1BY. Tel: 03708 506 506 (Mon-Fri 8-6). Email: enquiries@environment-agency.gov.uk

Flood Map for Land off Dearne Valley Parkway, Birdwell, Barnsley - Date Created: 16/07/2014 RFI: 29722

www.environment-agency.gov.uk

Scale: 1:10,000

N W E S

when reproduced @ A3

LEGEND

- Main River
- Detailed River Network
- CDS_CONTEXT.DRN.RIVERTYPE
- Primary River
- Secondary River
- Tertiary River
- D/S of High Water Mark
- D/S of Seaward Extension
- Lake / Reservior
- Canal
- Extended Culvert (greater than 50m)
- Canal Tunnel
- Underground River (inferred)
- Underground River (local knowledge)
- Flood Zone 2 (FZ2)
- Flood Zone 3 (FZ3)
- Flood Map Flood Defences

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

Appendix 4 – Yorkshire Water Correspondence

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).

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).

19. Please note that the information supplied on the enclosed plans is reproduced from Ordnance Survey material with the permission of the Ordnance Survey on behalf of the Controller of Her Majesty's Stationery Office, © Crown Copyright. Unauthorised reproduction infringes Crown Copyright and may lead to prosecution or civil proceedings. Licence Number 1000019559.

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 0845 124 24 24.

Sewer Legend


Combined Sewer


S24 Combined Sewer


Surface Water Sewer


S24 Surface Water Sewer


Foul Sewer


S24 Foul Sewer


Section 104 Sewer

Public Rising Main


Pumping Station


Abandoned Sewer

Public Sewage
Treatment Works


Syphon Sewer &
Vacuum Sewer

\+ Property Identifier

Water Legend

Water Main 4" and below

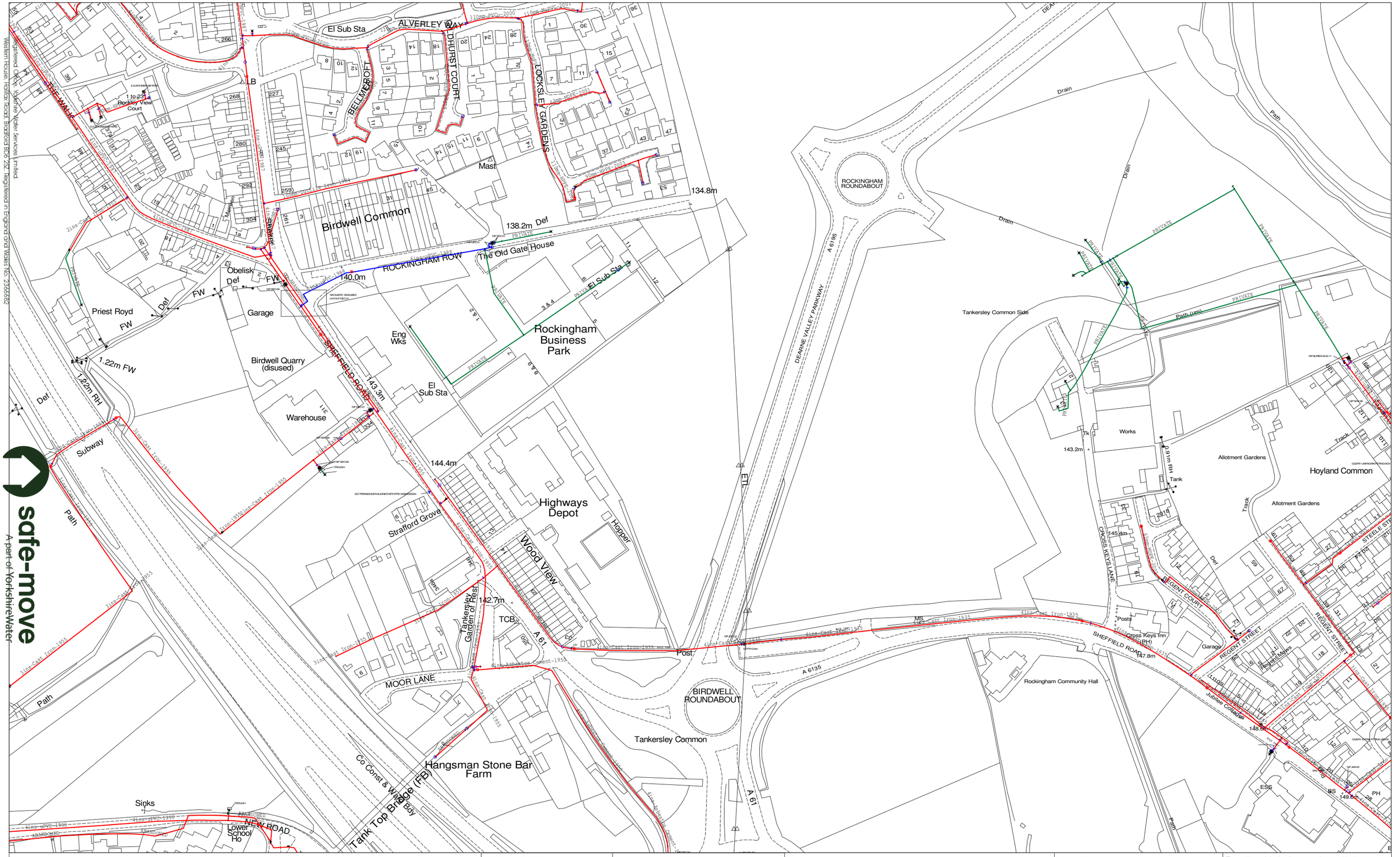
Water Main 4" and above

Raw Water Main

Private Water Main

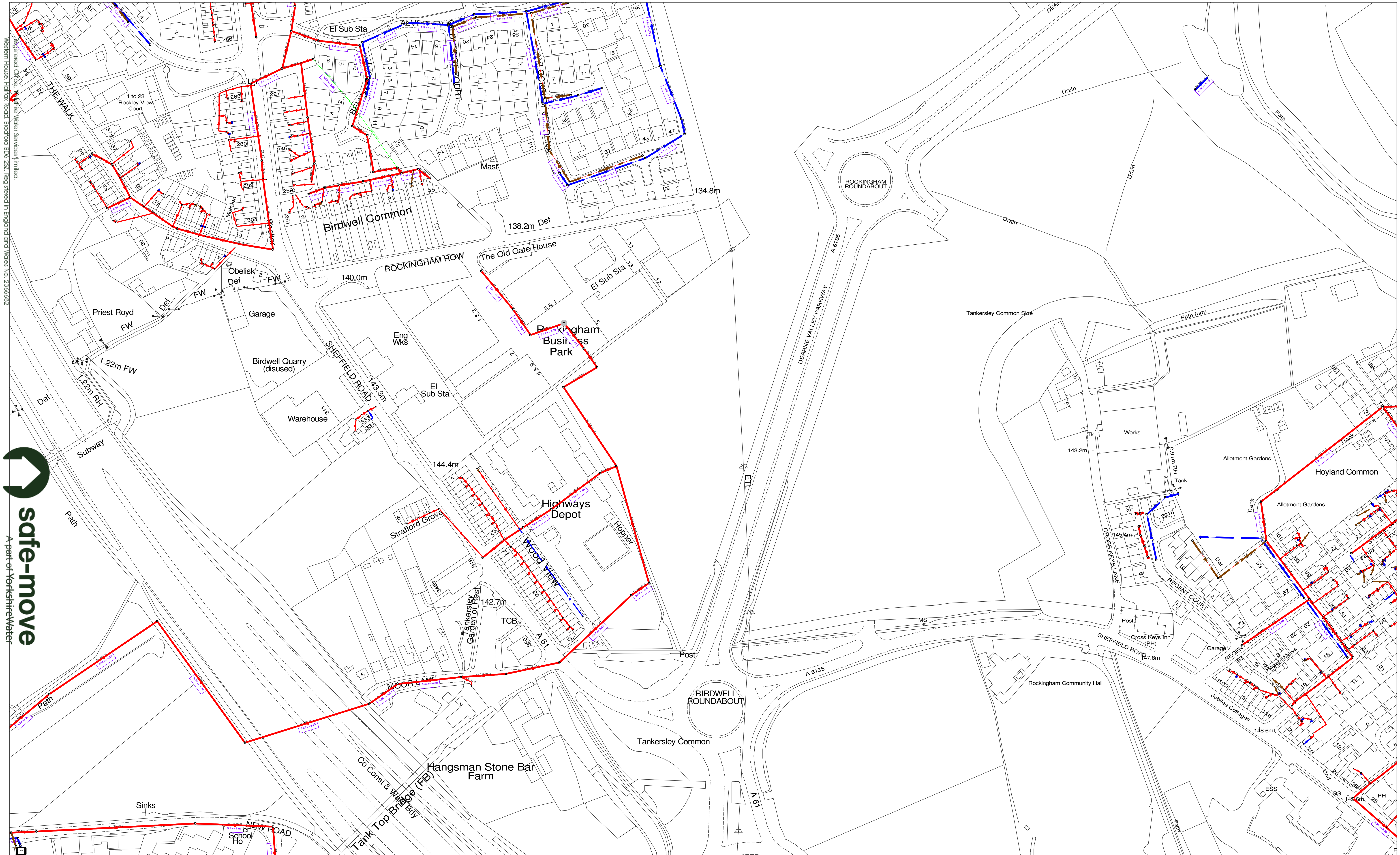

Fire Hydrant


Pumping Station



434529 : 400276	Map Name : SE3400SW	Title	Partial Key Water mains up to 4" in diameter Water mains over 4" in diameter Raw water mains Private water mains
	Yorkshire Water, PO Box 500, Halifax Road, Bradford BD6 2LZ Contact Name : Ms H Webster 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 : 1:2500
		(Ody) COPYRIGHT STATEMENTS: Reproduced by permission of Ordnance Survey on behalf of HMSO © Crown copyright and database 2004. All rights reserved Ordnance Survey Licence number 100019559	Drg No : / Maris No :
			Date Req : 18/06/2014, 12:36:12 / Date Gen : 18/06/2014, 12:36:13
			Source : Water Network Enquiry

UPN: Undefined Originator: H Webster, Safe Move,



434529 : 400276	Map Name : SE3400SW	Title	Partial Key
YorkshireWater	Yorkshire Water, PO Box 500, Halifax Road, Bradford BD6 2LZ Contact Name : Ms H Webster Contact Tel :	Notes	Foul Sewer = F Combined Sewer = C Surface Water Sewer = SW Trade Sewer = TD Partially Separate = PS

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.

Date Req : 18/06/2014, 12:36:37
Date Gen : 18/06/2014, 12:36:38
Source : Sewer Network Enquiry

UPN: Undefined
Originator: H Webster, Safe Move,

Safe-Move
DX 723020 BRADFORD 20
or
PO Box 99 Bradford BD3 7YB

Tel: 0800 1 385 385
Fax: 01274 253502

Your Ref: SHF.828
Our Ref: LNX1-9L7ED5

Enzygo Ltd
STEP Business Centre, Deepcar
Sheffield
South Yorkshire
S36 2UH

18 June 2014

Dear Sirs,

Thank you for your request dated 18 June 2014 .

Please find enclosed the results of your Asset Record Search. If you need to discuss anything please do not hesitate to contact us.

Safe-Move enquiry completed for:

VAT Regn. No. 500 5557 80

Payment Exc. VAT	£25.00
VAT 20% on £25.00	£5.00
Total Inc. VAT	£30.00

We thank you for your enquiry and hope we can be of assistance in the future.

Yours faithfully,

Heather Webster
Searches Advisor

YorkshireWater

RECEIVED
22 AUG 2014

Yorkshire Water Services
Developer Services
Sewerage Technical Team
PO BOX 52
Bradford
BD3 7AY

Tel: 0345 120 8482
Fax: (01274) 372 834

Email:
Technical.Sewerage@yorkshirewater.co.uk

For telephone enquiries ring:

Kashif Khan on 0345 120 8482

13th August 2014

Enzygo LTD
Step Business Centre
Business Centre; Wortley Road
Deepcar
Sheffield
S36 2UH

FAO: Scott Dawson

Your Ref:
Our Ref: Q013359

Dear Sir,

Land off Dearne Valley Parkway, Rockingham, Birdwell, S70 5TT - Pre planning sewerage enquiry on P518634

Thank you for your recent enquiry and remittance. Our official VAT receipt has been sent to you under separate cover. Please find enclosed a complimentary extract from the Statutory Sewer Map which indicates the recorded position of the public sewers. Please note that as of October 2011 and the private to public sewer transfer, there are many uncharted Yorkshire Water assets currently not shown on our records.

The following comments reflect our view, with regard to the public sewer network only, based on a 'desk top' study of the site and are valid for a maximum period of twelve months:

There is a 225 mm diameter public combined sewer recorded crossing/within the site. No buildings, or other obstructions, are to be erected within 5 (five) metres, nor trees planted within 5 (five) metres of this public sewer. It may not be acceptable to raise or lower ground levels over the sewer, nor to restrict access to the manholes on the sewer. If you wish to have this sewer diverted under Section 185 of the Water Industry Act 1991 an application should be made in writing. To discuss this matter, please telephone 0345 120 84 82.

Development of the site should take place with separate systems for foul and surface water drainage. The separate systems should extend to the points of discharge to be agreed.

Foul water domestic waste should discharge to the 225 mm diameter public combined sewer recorded crossing/within the site.

From the information supplied, it is not possible to determine if the whole site will drain by gravity to the public sewer network. If the site, or part of it, will not drain by gravity, then it is likely that a sewage pumping station will be required to facilitate connection to the public sewer network. If sewage pumping is required foul water discharge must not exceed 5 (five) litres per second.

The developer's attention is drawn to Requirement H3 of the Building Regulations 2000. This establishes a preferred hierarchy for surface water disposal. Consideration should firstly be given to discharge to soakaway, infiltration system and watercourse in that priority order.

Sustainable Drainage Systems (SuDS), for example the use of soakaways and/or permeable hardstanding etc, may be a suitable solution for surface water disposal appropriate in this situation. You are advised to seek comments on the suitability of SuDS in this instance from the appropriate

authorities.

As the proposal site is currently undeveloped no surface water is known to have previously discharged to the public sewer network. Therefore, it is unlikely that the local public sewer network will have capacity to accept the discharge of surface water from the proposal. If SuDS are not viable, the developer is advised to contact the Environment Agency/local Land Drainage Authority with a view to establishing a suitable watercourse for discharge.

It is understood that watercourses are located to the north-east of the site. This appears to be the obvious place for surface water disposal (if SuDS are not viable).

Please note further restrictions on surface water disposal from the site may be imposed by other parties. You are strongly advised to seek advice/comments from the Environment Agency/Land Drainage Authority, with regard to surface water disposal from the site.

Prospectively adoptable sewers and pumping stations must be designed and constructed in accordance with the WRc publication "Sewers for Adoption - a design and construction guide for developers" 6th Edition as supplemented by Yorkshire Water's requirements, pursuant to an agreement under Section 104 of the Water Industry Act 1991. An application to enter into a Section 104 agreement must be made in writing prior to any works commencing on site. Please contact our Developer Services Team (telephone 0345 120 84 82) for further information.

The public sewer network is for domestic sewage purposes. This generally means foul water for domestic purposes and, where a suitable surface water or combined sewer is available, surface water from the roofs of buildings together with surface water from paved areas of land appurtenant to those buildings. Land and highway drainage have no right of connection to the public sewer network. No land drainage to be connected/discharged to public sewer.

Any new connection to an existing public sewer will require the prior approval of Yorkshire Water. You may obtain an application form from our website (www.yorkshirewater.com) or by telephoning 0345 120 84 82.

All the above comments are based upon the information and records available at the present time. The information contained in this letter together with that shown on any extract from the Statutory Sewer Map that may be enclosed is believed to be correct and is supplied in good faith. Please note that capacity in the public sewer network is not reserved for specific future development. It is used up on a 'first come, first served' basis. You should visit the site and establish the line and level of any public sewers affecting your proposals before the commencement of any design work.

Yours faithfully

Developer Services Team

El Sub Sta
ALVERLEY WAY
GOLDHURST COURT
LOCKSLEY GARDENS
BELLHOUSE CLOSE
Mast
134.8m
138.2m Def
Birdwell Common
ROCKINGHAM ROW
The Old Gate House
140.0m
El Sub Sta
Rockingham Business Park
Eng Wks
SHEFFIELD ROAD
143.3m
El Sub Sta
144.4m
ROCKINGHAM ROUNDABOUT
A 6195
DEARNE VALLEY PARKWAY

Highways Depot

Hopper

Wood View

Strafford Grove

Tankersley Garden of Rest

142.7m

TCB

A 61

MOOR LANE

5.07m deep

5.97m deep

Post

MS

A 6135

BIRDWELL ROUNDABOUT

Tankersley Common

Hangsman Stone Bar Farm

Co Const & Ward Bdy

Tank Top Bridge (FB)

A 61

434775 : 400347	Map Name : SE3400SE
YorkshireWater	Yorkshire Water, PO Box 500, Halifax Road, Bradford BD6 2LZ Contact Name : K KHAN Contact Tel :

Title

Notes

UR : No Recorded depth.

Partial Key

Foul Sewer = F

Combined Sewer = C

Surface Water Sewer = SW

Trade Sewer = TD

Partially Separate = PS

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.

Date Req : 13/08/2014, 11:38:21

Date Gen : 13/08/2014, 11:38:33

Source : Sewer Network Enquiry

UPN: Undefined

Originator: K KHAN, New Development - Waste Water,

From: **john.wellham@yorkshirewater.co.uk**

Sent: **21 October 2014 09:16**

To: **Scott Dawson**

Subject: **RE: FW: SHF.1122.002 - Rockingham, Birdwell - P471736**

Attachments: **pic02538.gif**

Good morning Scott

Thank you for bearing with me these last few days.

As discussed, I am happy to agree a restricted discharge of surface water of 5 (five) litres per second. I have attached a rough sketch of the connection point including the recorded depth to invert. When you come to submitting your planning app, if your drainage drawing can include this discharge rate etc it will speed things up for your development.

Regards

John Wellham
Developer Services Technician
Yorkshire Water
0345 120 8482 (08:00 - 17:00)

(Embedded image moved to file: pic02538.gif)

-----Original Message-----

From: Scott Dawson

Sent: 07 October 2014 13:09

To: 'john.wellham@yorkshirewater.co.uk'

Cc: Matt Travis

Subject: RE: SHF.1122.002 - Rockingham, Birdwell - P471736

Hi John,

Find attached. Look forward to your response.

Thanks

Scott Dawson BSc (Hons), MSc

Environmental Consultant

Enzygo Ltd,

STEP Business Centre

Wortley Road, Deepcar

Sheffield, S36 2UH

Mob:???? +44 (0) 7808 768327

Email:??? scott.dawson@enzygo.com

Web:????? www.enzygo.com

-----Original Message-----

From: john.wellham@yorkshirewater.co.uk [mailto:john.wellham@yorkshirewater.co.uk]

Sent: 07 October 2014 11:31

To: Scott Dawson

Cc: Matt Travis

Subject: RE: SHF.1122.002 - Rockingham, Birdwell - P471736

Good morning Scott

If you could send me the geo-technical report for your site I will be happy to discuss discharge to the surface water sewer. I don't need you to do an infiltration test if you've already investigated the ground. But I will need the report.

Regards

John Wellham

Developer Services Technician

Yorkshire Water

0345 120 8482 (08:00 - 17:00)

…….

|RE: SHF.1122.002 - Rockingham, Birdwell - P471736

John,

Thanks for responding so soon. We have already investigated the various aspects of the site including geology and potential sources of pollution to the groundwater environment. Based on the investigations, the site, though in appearance greenfield, is actually reclaimed brownfield land associated with mining activity at the Rockingham pit. The site is underlain by former coal workings with associated geology and soil types which would not be suitable for a sole soakaway system (clays overlying mudstones and coal
measures) with impeded drainage. Please see the comment below this email from our geo engineer following his investigations. I can always send you the report if that helps.

If you still require an infiltration test doing then that's what we'll do.
But based on the evidence, it would be wasted effort.

Let me know your thoughts and thanks

Scott Dawson BSc (Hons), MSc
Environmental Consultant

.....

From: Richard Hamilton

Sent: 06 October 2014 15:04

To: Matt Travis

Cc: Steve Rhodes

Subject: Birdwell

Matt

Based on the desk study and a review of the geological conditions of the site no superficial materials

have been recorded for the site and the solid geology comprises mudstones, siltstone and sandstone which are likely to weather up to clay at the surface. Based on this it is unlikely that soakaway will work.

Based on the coal working underneath the site it is likely that the addition of soakaway waters into the potential workings is not be recommended.

Based on the contamination of the surrounding areas ~9gas works and depots the introduction of groundwater in the vicinity of the site boundaries is not recommended.

Regards

Richard Hamilton
Associate Director

Enzygo Ltd,
The Granary, Woodend Lane, Cromhall
Gloucestershire, GL12 8AA

Tel: 01454 269237
Fax: 01454 269760
Mob: 07880197002
Email: Richard.hamilton@enzygo.com

www.enzygo.com
??Please consider the environment before printing this email

.....

Enzygo Ltd,
STEP Business Centre
Wortley Road, Deepcar
Sheffield, S36 2UH

Mob:???? +44 (0) 7808 768327
Email:??? scott.dawson@enzygo.com

Web:????? www.enzygo.com

-----Original Message-----

From: john.wellham@yorkshirewater.co.uk [mailto:john.wellham@yorkshirewater.co.uk]

Sent: 06 October 2014 13:56

To: Scott Dawson; Matt Travis

Cc: aniqa.a.hashmi@yorkshirewater.co.uk

Subject: Re: SHF.1122.002 - Rockingham, Birdwell - P471736

Good afternoon Scott

Thank you for your email. It was nice to speak with you earlier today.

You are proposing to discharge surface water to public sewer however, sustainable development requires appropriate surface water disposal.

Yorkshire Water promote the surface water disposal hierarchy as detailed in Part H3 of Building Regulations. You, as the developer, must provide evidence to demonstrate that surface water disposal via:

·infiltration

or

·watercourse

are not reasonably practical before considering disposal to sewer.

As discussed, before discharge to the public surface water network is considered, detailed ground investigations (bore holes, trial pits etc) are required in order to rule out the use of soakaways.

The proposal site is currently undeveloped and no positive surface water is known to have previously discharged to the public sewer network. As such the public sewer network does not have capacity to accept an unrestricted discharge of surface water. Surface water discharge to the existing public sewer network must only be as a last resort, the developer is required to eliminate other means of surface water disposal.

If you have any further queries, please feel free to call me on 0345 120
8482 quoting reference Q013359.

Regards

John Wellham
Developer Services Technician
Yorkshire Water
0345 120 8482 (08:00 - 17:00)
----- Forwarded by John Wellham/Water Business Unit/YWS/Yorkshire Water on
06/10/2014 13:44 -----
Hi Aniqa,

All details are in the below email. The attached images give an indication of the points highlighted for potential surface water connection from the development.

I'm looking to establish the capacities at these points, which connection point would be the preferential option for YW (if not the points
highlighted) and an agreement in principle to establish a detailed design with the use of this connection point.

Many thanks

Scott Dawson BSc (Hons), MSc
Environmental Consultant

Enzygo Ltd,
STEP Business Centre
Wortley Road, Deepcar
Sheffield, S36 2UH

Mob:???? +44 (0) 7808 768327
Email:??? scott.dawson@enzygo.com

Web:????? www.enzygo.com

-----Original Message-----

From: Scott Dawson

Sent: 30 September 2014 09:40

To: 'Philip.Randell@yorkshirewater.co.uk'

Cc: Matt Travis

Subject: FW: SHF.1122.002 - Rockingham, Birdwell - P471736

Dear Philip,

I have spoken to your colleague, Holly, yesterday regarding a response to my requests for information and provisional confirmation of our ability to connect surface water outfalls to the marked assets. I did try calling again this morning, however, your phone system indicates you are in a meeting until midday. Hope to hear from you this afternoon regarding the matter.

Regards

Scott Dawson BSc (Hons), MSc

Environmental Consultant

Enzygo Ltd,

STEP Business Centre

Wortley Road, Deepcar

Sheffield, S36 2UH

Mob:???? +44 (0) 7808 768327

Email:??? scott.dawson@enzygo.com

Web:????? www.enzygo.com

-----Original Message-----

From: Scott Dawson

Sent: 26 September 2014 15:06

To: 'Philip.Randell@yorkshirewater.co.uk'

Cc: Matt Travis

Subject: RE: SHF.1122.002 - Rockingham, Birdwell - P471736

Dear Philip,

Are you able to respond to this request for info (dated 28th August) or do we need to contact someone else?

Regards

Scott Dawson BSc (Hons), MSc

Environmental Consultant

Enzygo Ltd,

STEP Business Centre

Wortley Road, Deepcar

Sheffield, S36 2UH

Mob:???? +44 (0) 7808 768327

Email:??? scott.dawson@enzygo.com

Web:????? www.enzygo.com

-----Original Message-----

From: Scott Dawson

Sent: 28 August 2014 16:49

To: 'Philip.Randell@yorkshirewater.co.uk'

Cc: Matt Travis

Subject: RE: SHF.1122.002 - Rockingham, Birdwell - P471736

Hi Phillip,

We have now received the capacity information so thanks for that. We would now would like to enter

into discussions about a possible connection into the surface water asset located in the north of the site (see attached annotation of your plan). We are looking to connect into the identified manhole and establish what permitted flows of surface water you would accept to this. We are looking for an agreement in principle to requisition a sewer to this point. If upgrades are needed to the asset to cater for flows from our site, this is something we would consider and again, would like your terms on this to gain an agreement in principal from YW to use this asset.

With regards to foul flows, we are looking to connect into the foul asset to the south as annotated in the attachment. Similarly, we are looking for YW conditions to allow us to gain an agreement in principle to connect to this asset (i.e. permitted flows and connection point, pumping requirements if applicable).

Many thanks and I look forward to your response

Scott Dawson BSc (Hons), MSc
Environmental Consultant

Enzygo Ltd,
STEP Business Centre
Wortley Road, Deepcar
Sheffield, S36 2UH

Mob:???? +44 (0) 7808 768327
Email:??? scott.dawson@enzygo.com
Web:????? www.enzygo.com

-----Original Message-----
From: Philip.Randell@yorkshirewater.co.uk [mailto:Philip.Randell@yorkshirewater.co.uk]
Sent: 13 August 2014 09:47
To: Scott Dawson
Subject: RE: SHF.1122.002 - Rockingham, Birdwell - P471736

Thats great.

Thanks a lot

Philip Randell

Developer Services Assistant

Appendix 5 – Barnsley Metropolitan Council Correspondence

From: Bell , Derek
To: Scott Dawson
Subject: FW: SHF.828 - Rockingham, Birdwell cr no 128331
Date: 23 June 2014 11:11:34

Dear Scott,

In response to your recent enquiry I can confirm that the Council has no records of any culverted or open watercourses crossing the site indicated on the attached plan. In addition I'm not aware of any flooding issues associated with the site, and would confirm that to my knowledge it is not affected by any flood plains from major watercourses in the area.

Furthermore, you should note that there should be no increase in surface water runoff from the new development as 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 combined public sewer within this site therefore you should contact Yorkshire Water if you wish to discharge to these sewers to discuss allowable discharge rates and related matters.

Any balancing facility for the site 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 Drainage techniques (SuDs) 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.

The authority seeks to promote the use of SuDs techniques to this site and the authority expects the developer of the site to submit detailed investigations such that the use of SuDs has been fully explored.

As the Site area is greater than 1 Ha then a flood risk assessment in accordance with NPPF is required to be submitted with any planning application.

Regards ~ Derek

Derek Bell
Principal Network Resilience Manager
Highways, Engineering & Transportation
Barnsley Metropolitan Borough Council, Westgate Plaza 1, PO Box 601, Barnsley, S70 9FA*

** Sat Nav Reference - **S70 2DR***

Tel: Ext - 01226 787654 Int - 6654
Mob: 07773 783184
Fax: 01226 772196

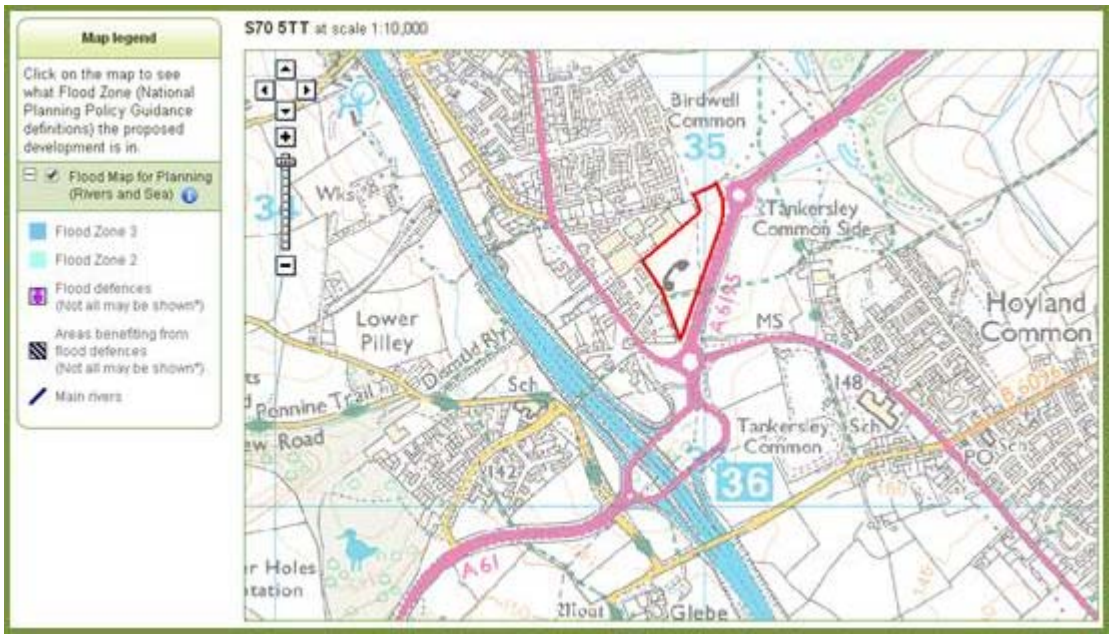
E-mail: DerekBell@barnsley.gov.uk

From: Scott Dawson [mailto:scott.dawson@enzygo.com]
Sent: 18 June 2014 11:03
To: DevelopmentControl & DevelopmentManagement
Subject: SHF.828 - Rockingham, Birdwell

Reference: SHF.828 – Land off Dearne Valley Parkway, Rockingham, Birdwell
Location: Birdwell, Barnsley, S70 5TT

To whom it may concern,

Enzygo have been commissioned to prepare a Flood Risk Assessment (FRA) in accordance with National Planning policy Framework (NPPF) for a proposed commercial development at land off the Dearne Valley Parkway (A6195), Birdwell, South Yorkshire, S70 5TT. The site is located at approximately 434959, 400561, and a site location has been attached:



Based on the Environment Agency's Flood Map the site is located entirely within Flood Zone 1; outside the 1 in 1000 annual probability of flooding from land and sea (<0.1% AEP).

As part of completing an FRA it is standard to contact the Local Planning Authority to determine the points outlined below. Apologies if this has not been sent to the correct address; the BC website is somewhat ambiguous when it comes to contact details regarding drainage enquiries. Please note that we are also consulting the Environment Agency with regards to this proposed development and have also reviewed the local SFRA:

- Do you have any records of historic flooding events on this site, either from fluvial sources and other sources (i.e. surface water, sewers, groundwater, reservoir etc.)? If you are aware of historical flooding at the site, can you please provide us with details of these historical flood events where it is available, including flood levels, estimated return periods, photographs, and other such data as may be relevant to our study?

- Do you have any information on drainage within the site and in the local area, including

any known drainage problems on site and in the local area?

- Have you any information on any existing flood defences, schedule flood defence maintenance or defence improvements within the site or within the general area?

- As required by the Building Regulations, we will need to consider discharge of surface water from the site to soakaway / infiltration as a first option. We would be grateful if you could provide us with any information that you have that may assist in our assessment of this option, such as details of sensitive aquifers in the area, known contamination issues, etc.

- Does the council have any requirements for a betterment (reduction) with regards to surface water discharge from a brownfield site/or a discharge flow limit to local watercourses?

- Please can you also indicate to us whether the council is aware of any relevant environmentally sensitive receptors (such as aquatic wildlife in receiving watercourses, etc.) in the area around the site that we should be aware of when preparing this Flood Risk Assessment?

Many thanks

Scott Dawson BSc (Hons), MSc
Environmental Consultant

Enzygo Ltd,
STEP Business Centre
Wortley Road, Deepcar
Sheffield, S36 2UH

Mob: +44 (0) 7808 768327
Email: scott.dawson@enzygo.com
Web: www.enzygo.com

Registered Office: Stag House, The Chipping, Wotton under Edge, GL12 7AD
Registered in England & Wales registered number: 06525159 VAT number: 931520846

Please consider the environment before printing this email

Appendix 6 – Barnsley Metropolitan Council SFRA Extracts

North

RIVER DEARNE

Sough Dike

RIVER DOVE

RIVER DON

Knoll Beck

1:126,172

LEGEND

Main River

Barnsley MBC Boundary

Topoghraphy (NextMap)

Elevation (m)

High : 1080.1

Low : -92

jba CONSULTING

MAP 1

STUDY AREA

North

1:126,172

LEGEND

Barnsley MBC Boundary

Main River

Historical Flood Extents

June 2007

Autumn 2000

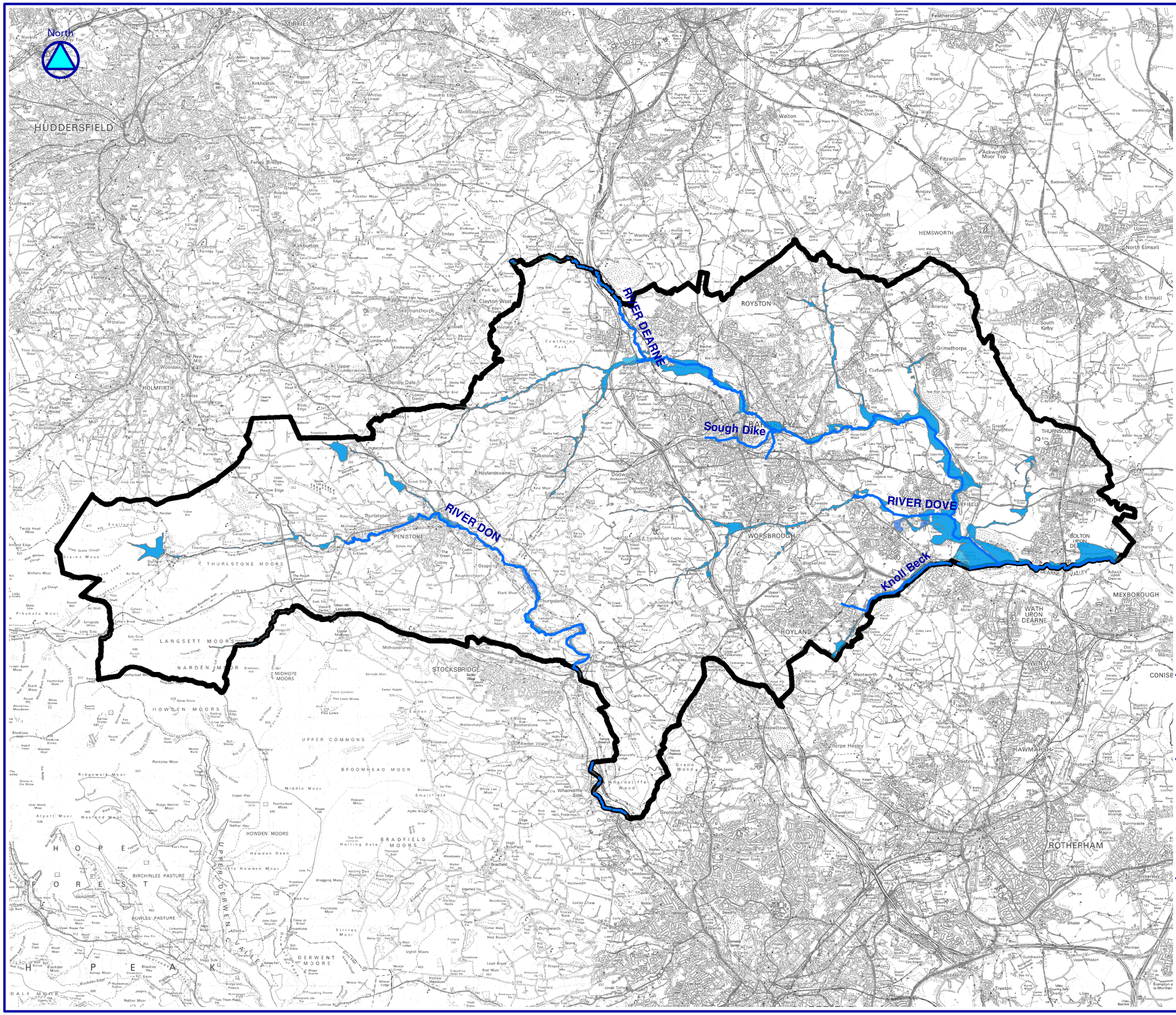
January 1982

March 1947

jba CONSULTING

MAP 2

HISTORICAL FLOOD EVENTS



LEGEND

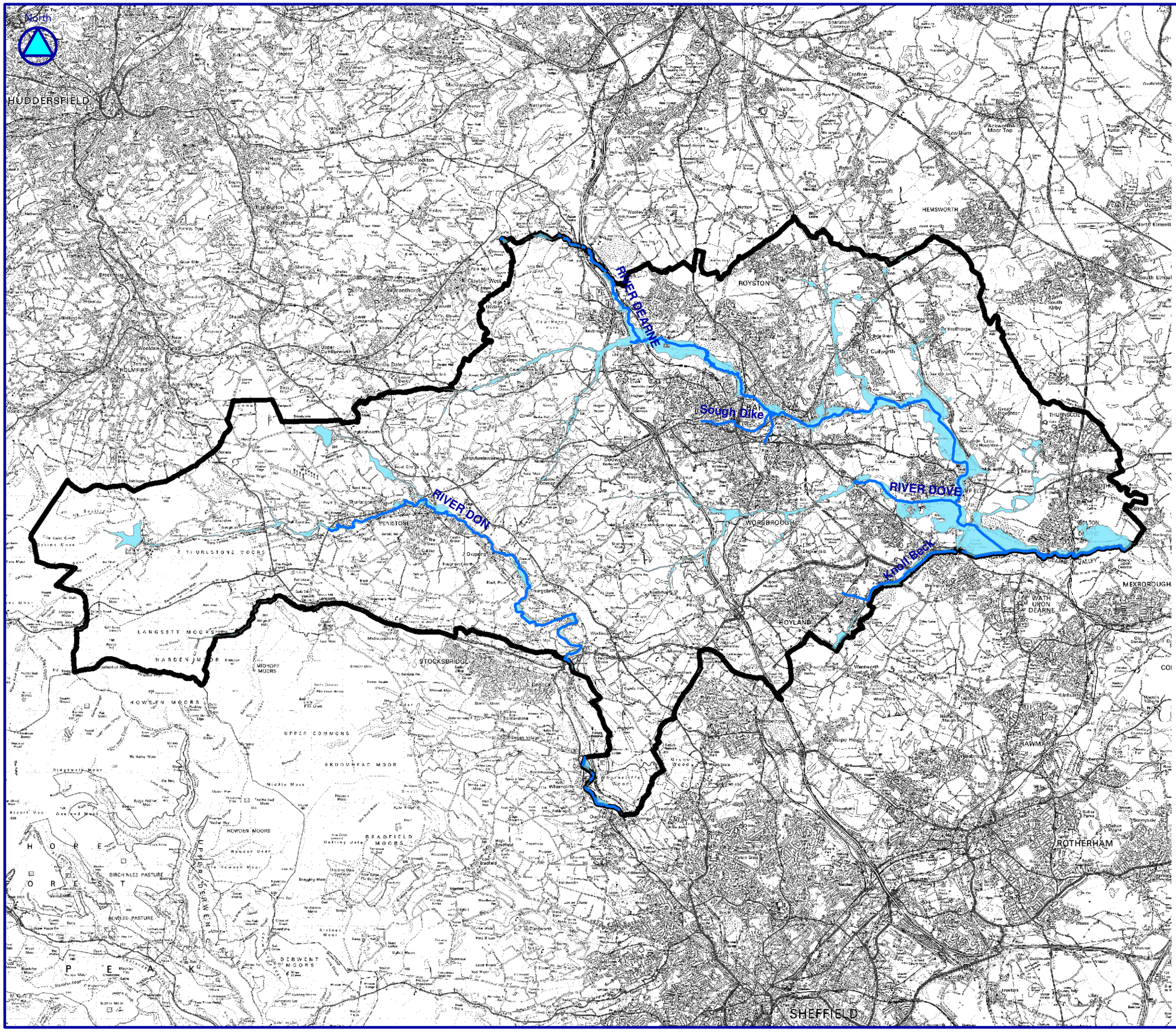
1:120,000

- Main River
- Flood Zone 3
- Barnsley MBC Boundary

jba CONSULTING

MAP 3

FLOOD ZONE 3



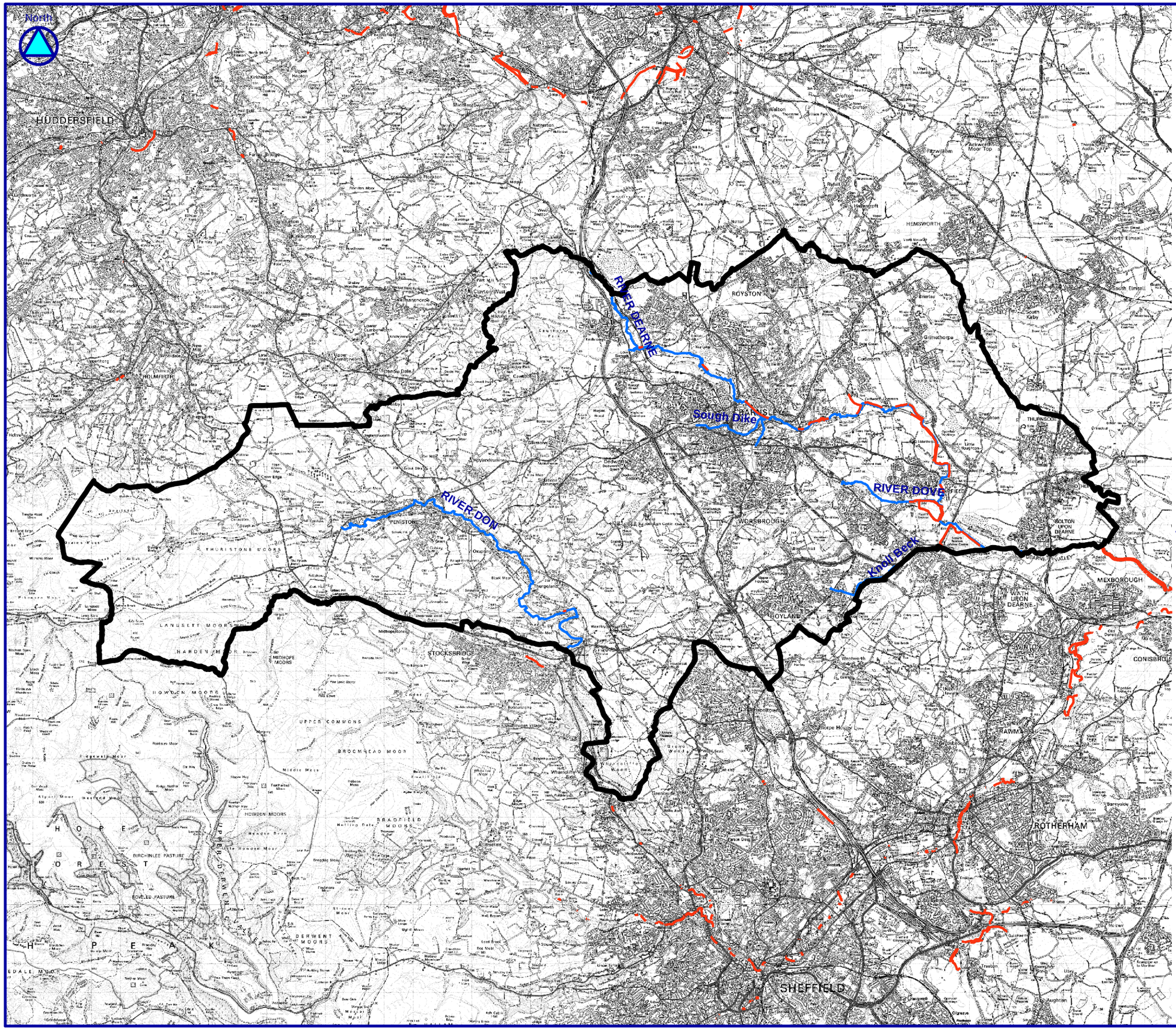
LEGEND 1:120,000

- Main River
- Flood Zone 2
- Barnsley MBC Boundary

jba CONSULTING

MAP 4

FLOOD ZONE 2



1:126,172

LEGEND

Barnsley MBC Boundary

Main River

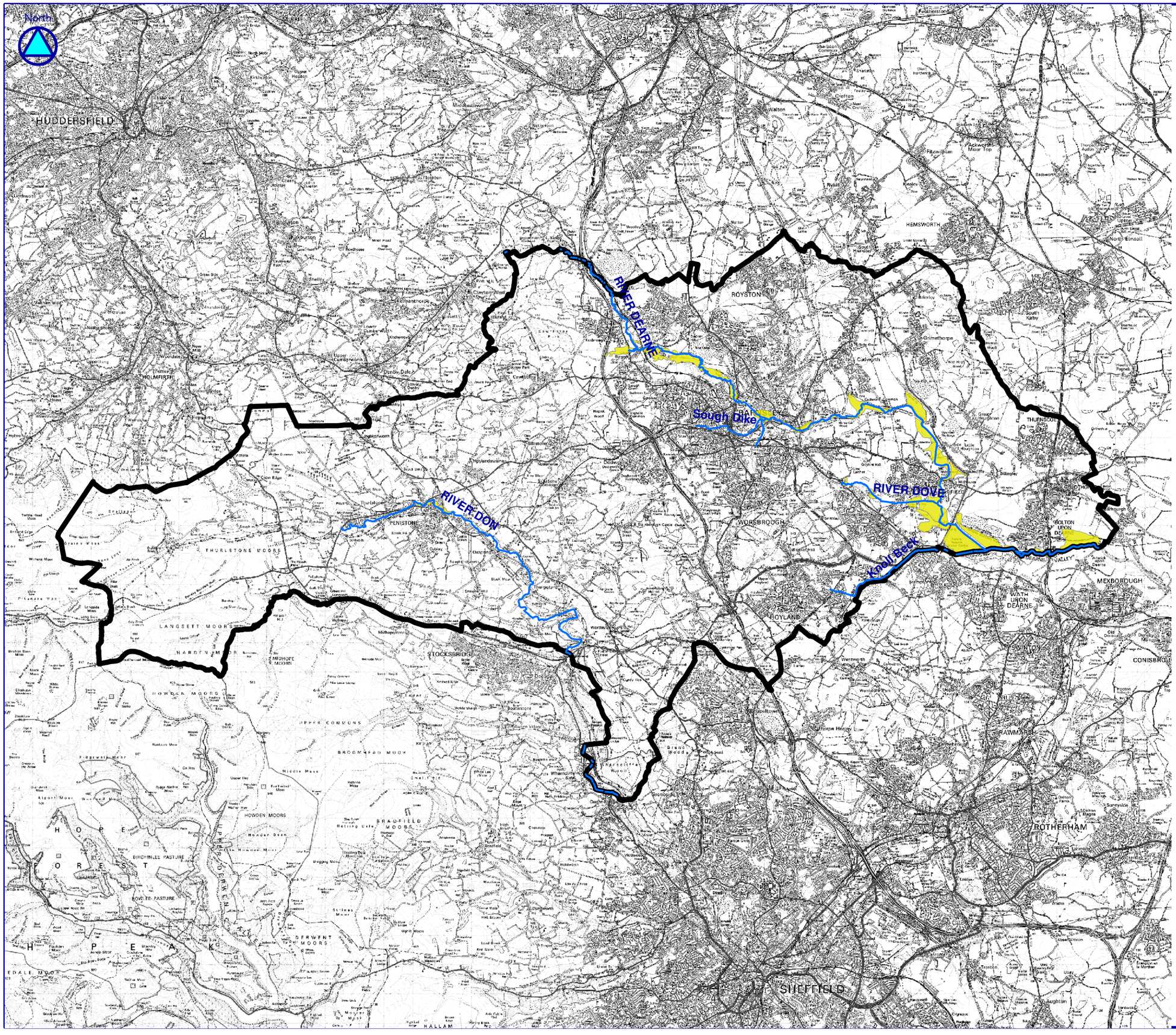
Existing Flood Defences

Flood Defence

jba CONSULTING

MAP 5

EXISTING DEFENCES



LEGEND

1:126,172

- Main River
- Barnsley MBC Boundary
- Functional Floodplain (FZ3b)

jba CONSULTING

MAP 6

FUNCTIONAL FLOODPLAIN (FZ3b)

Appendix 7 – WinDes Outputs

ICP SUDS Mean Annual Flood

Input

Return Period (years)	1	Soil	0.300
Area (Ha)	3.350	Urban	0.000
SAAR (mm)	709.000	Region Number	3

Results **l/s**

QBAR Rural		6.2
QBAR Urban		6.2
Q	1 year	5.3
Q	1 year	5.3
Q	30 years	10.9
Q	100 years	12.9

ICP SUDS Mean Annual Flood

Input

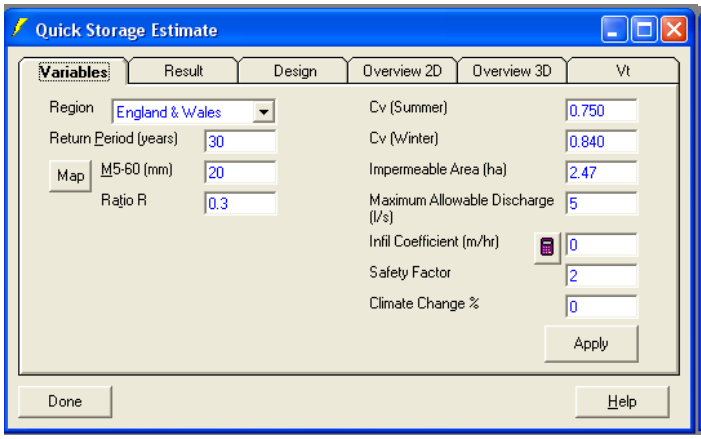
Return Period (years)	1	Soil	0.300
Area (Ha)	3.350	Urban	0.740
SAAR (mm)	709.000	Region Number	3

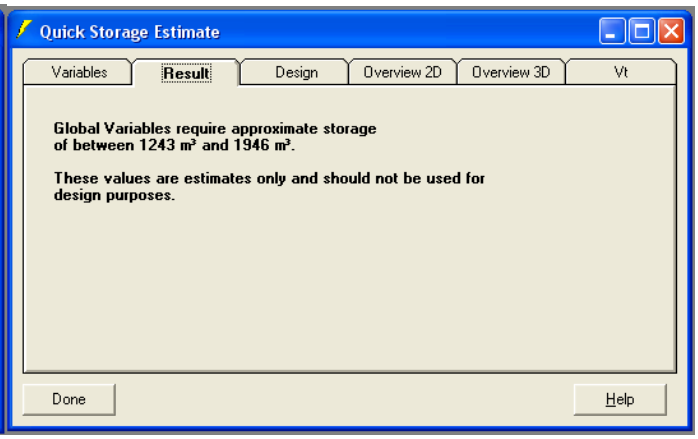
Results l/s

QBAR Rural	6.2
QBAR Urban	19.7
Q 1 year	17.0
Q 1 year	17.0
Q 30 years	30.0
Q 100 years	32.0

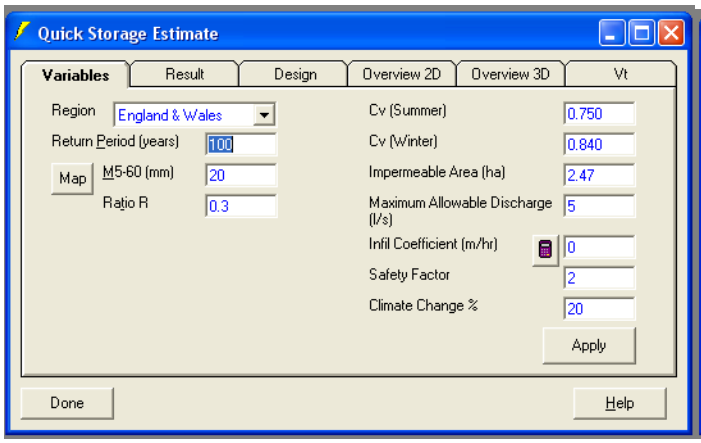
Rockingham Storm Attenuation

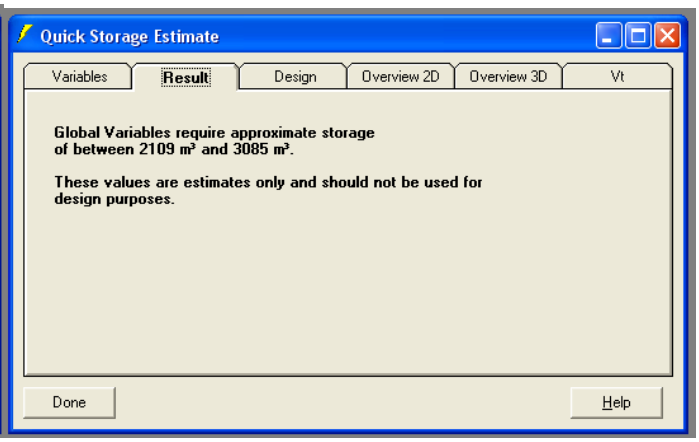
1 in 30 year storm attenuation





1 in 100 year (plus climate change) storm attenuation





Enzygo specialise in a wide range of technical services:

Property and Sites
Waste and Mineral Planning
Waste Technologies and Renewables
Landscape and Visual Impact
Environmental Assessment Co-ordination
Hydrology and Flood Risk
Waste Contract Procurement
Noise and Vibration
Environmental Permitting and Regulation
Development Planning & Policy
Ecology Services
Contaminated Land and Geotechnical
Traffic and Transportation

BRISTOL OFFICE
The Granary
Woodend Lane
Cromhall
Bristol GL12 8AA
Tel: 01454 269237
Fax: 01454 269760

kevin.parr@enzygo.com

SHEFFIELD OFFICE
STEP Business Centre
Wortley Road
Deepcar
Sheffield S36 2UH
Tel: 0114 2903677
Fax: 0114 2903688

matt.travis@enzygo.com

Please visit our website for more information.

enzygo.com