

Land North of Dinas Powys Preliminary Flood Risk Assessment and Drainage Strategy

Version 1

June 2022

www.jbaconsulting.com

**Persimmon Home East Wales
Llantrisant Business Park
LLANTRISANT
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JBA Project Manager

Revision History

Revision Ref/Date	Amendments	Issued to
June 2022		

Contract

Purpose

This report was prepared by JBA Consulting as a confidential document other than anyone else who has reviewed and prepared this report except to Persimmon Homes

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List of Tables

Abbreviations

1 Introduction

2 The Site

2.1 Site Description

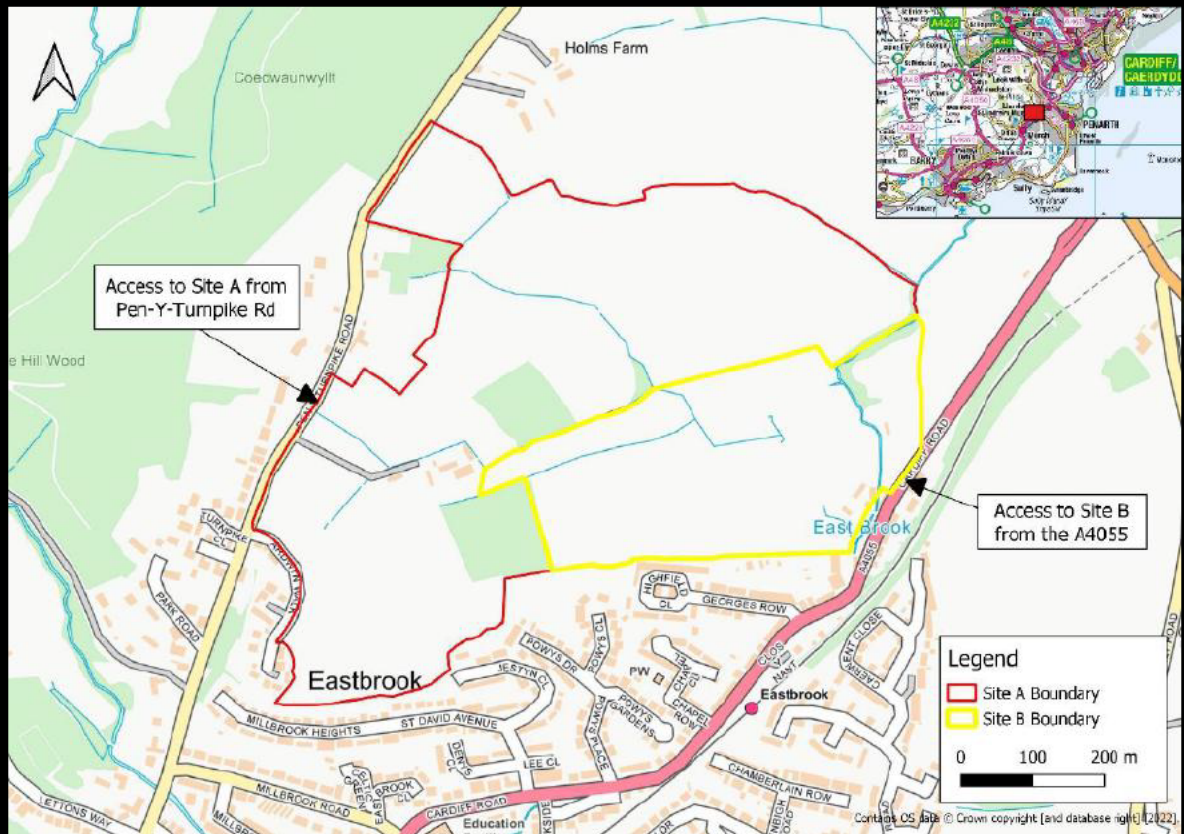


Figure 2-1 Site Location

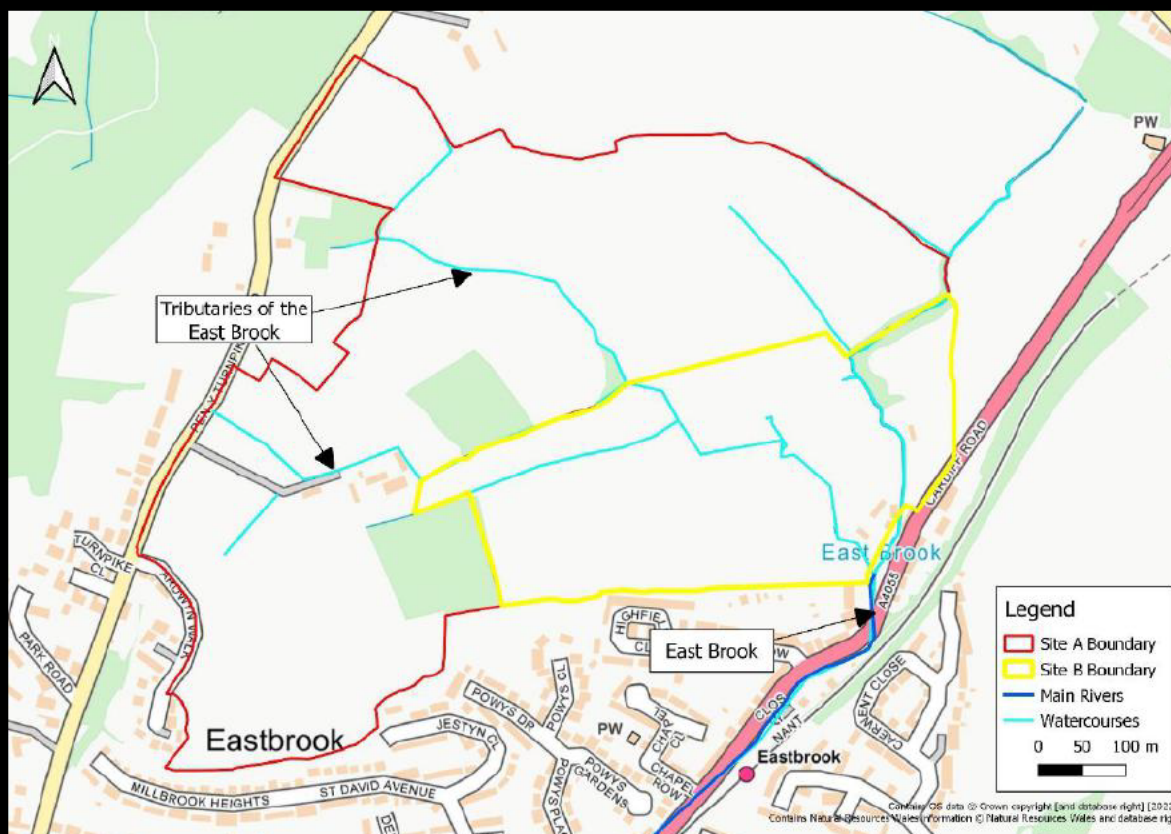


Figure 2-2 Watercourses

2.2 Site Topography

The topographic data for the site has been used to generate a topographic map of the site (Figure 2-3). The map shows the contours of the site and the location of the watercourses. The map also shows the location of the site boundaries and the location of the surrounding roads and buildings. The map is a useful tool for understanding the topography of the site and for planning the development of the site. The map shows that the site is located in a valley, with the East Brook flowing through it. The map also shows that the site is surrounded by roads and buildings, which may affect the development of the site. The map is a useful tool for understanding the topography of the site and for planning the development of the site. The map shows that the site is located in a valley, with the East Brook flowing through it. The map also shows that the site is surrounded by roads and buildings, which may affect the development of the site.

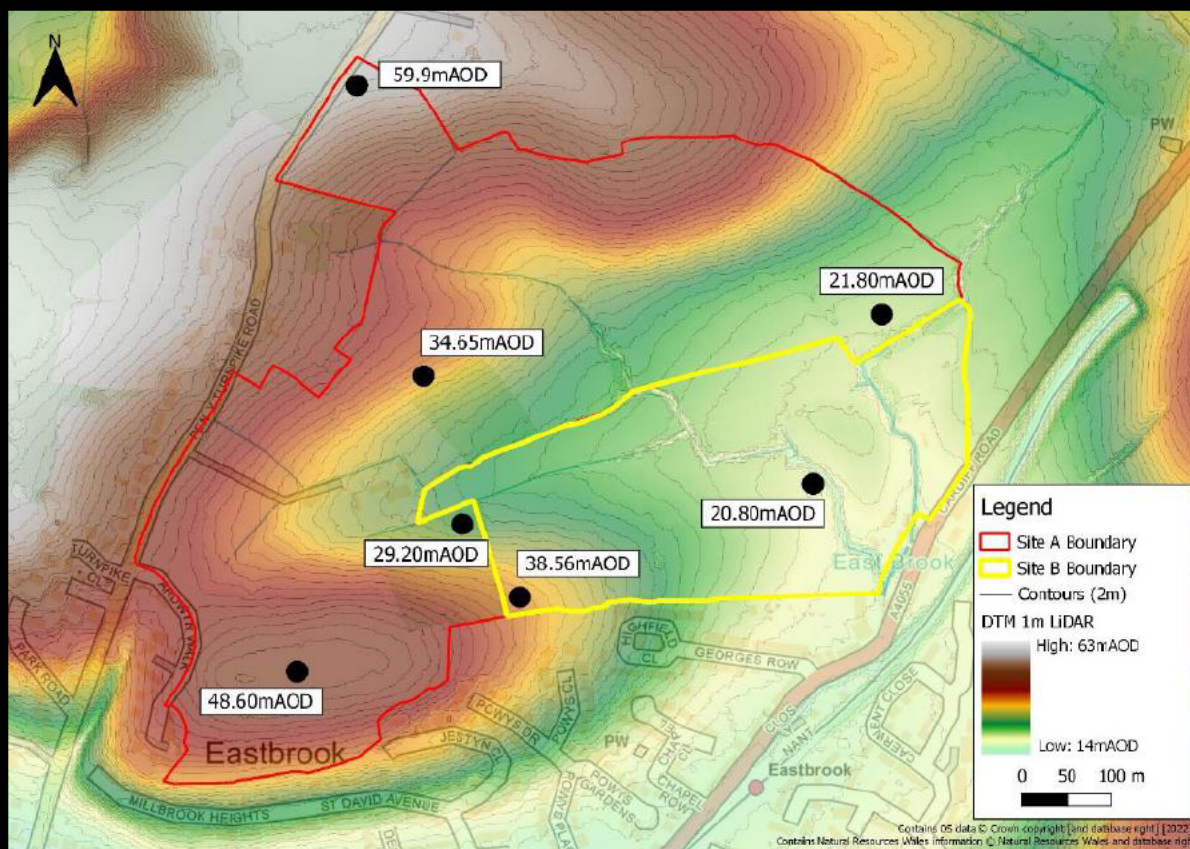


Figure 2-3 2m LIDAR 2m DTM across the development site and surrounding area

3 Planning Policy

3.1 Vale of Glamorgan Council Adopted Local Development Plan (2017)

The Vale of Glamorgan Council's Local Development Plan (LDP) was adopted in 2017 and sets out the council's planning policies for the period 2017 to 2033. The LDP is a statutory document and is the primary planning policy for the council. It sets out the council's vision for the future of the Vale of Glamorgan and the policies that will be used to achieve this vision. The LDP also sets out the council's policies for the development of the Vale of Glamorgan, including policies for housing, employment, transport, and the environment. The LDP is a key document for the council and is used to guide the development of the Vale of Glamorgan.

3.2 Planning Context

The Vale of Glamorgan Council's Local Development Plan (LDP) was adopted in 2017 and sets out the council's planning policies for the period 2017 to 2033. The LDP is a statutory document and is the primary planning policy for the council. It sets out the council's vision for the future of the Vale of Glamorgan and the policies that will be used to achieve this vision. The LDP also sets out the council's policies for the development of the Vale of Glamorgan, including policies for housing, employment, transport, and the environment. The LDP is a key document for the council and is used to guide the development of the Vale of Glamorgan. The LDP is a statutory document and is the primary planning policy for the council. It sets out the council's vision for the future of the Vale of Glamorgan and the policies that will be used to achieve this vision. The LDP also sets out the council's policies for the development of the Vale of Glamorgan, including policies for housing, employment, transport, and the environment. The LDP is a key document for the council and is used to guide the development of the Vale of Glamorgan.

3.3 Extant TAN-15

3.3.1 Vulnerability classification

The Vale of Glamorgan Council's Local Development Plan (LDP) sets out the council's policies for the development of the Vale of Glamorgan. The LDP also sets out the council's policies for the development of the Vale of Glamorgan, including policies for housing, employment, transport, and the environment. The LDP is a key document for the council and is used to guide the development of the Vale of Glamorgan. The LDP is a statutory document and is the primary planning policy for the council. It sets out the council's vision for the future of the Vale of Glamorgan and the policies that will be used to achieve this vision. The LDP also sets out the council's policies for the development of the Vale of Glamorgan, including policies for housing, employment, transport, and the environment. The LDP is a key document for the council and is used to guide the development of the Vale of Glamorgan.

Development category	Types
Emergency services	
Highly vulnerable development	
Less vulnerable development	



Figure 3-1 Development Advice Map

3.4 Updated TAN-15 (Expected Release June 2023)

3.4.1 Vulnerability Classification

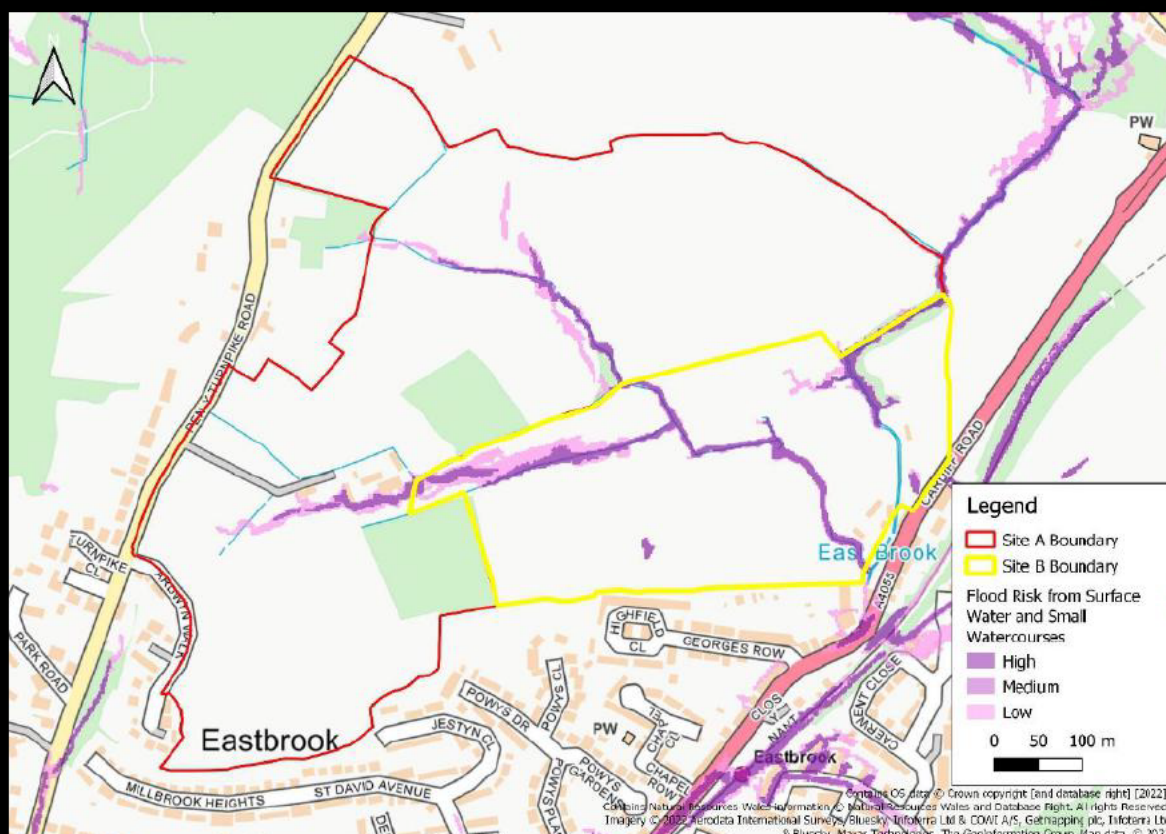
The updated TAN-15 provides a vulnerability classification for development, as shown in Table 3-2. The updated TAN-15 also provides a vulnerability classification for development, as shown in Table 3-2.

Table 3-2 Development categories defined by the updated TAN-15

Development category	Types
Highly vulnerable development	<p>Development types including: hotels, Gypsy and Traveller sites, caravan parks and camping sites, residential care establishments, colleges, and universities.</p> <p>Development types including: GP surgeries, health centres, and other medical facilities.</p> <p>Development types including: industrial development, power stations, distribution elements, power stations, and other industrial plants, incinerators, and waste management facilities.</p> <p>Development types including: ambulance stations, fire stations, police stations, command centres, and other emergency services.</p> <p>Development types including: emergency shelter, and other emergency services.</p>
Less vulnerable	<p>Development types including: residential, commercial, and retail.</p>

development	
Water compatible development	





4 Assessment of Flood Risk

Table 4-1 Summary of flood risk

Source of Flooding	Onsite Presence	Description
Flood Risk from Rivers	✓	
Flood Risk from the Sea		
Flood Risk from Surface Water and Small Watercourses	✓	
Flood Risk from Groundwater		
Flood Risk from Reservoirs		
Flood Risk from Sewers		

4.1 Flood History & Flood Risk Management Proposals

The flood risk to the site is caused by nearby flood events caused by rainfall, which has been exacerbated by the River Development Scheme. The remaining floodplain is not protected by any defences. Internal property damage has occurred in 2008 and most recently in 2013, 1973, 1995, 2007, 2012 and 2013. It shall be essential that development should address the issues. Ideally, development should be sited in a low risk situation.

The City of Dallas (CoC) to management flood risk in Dallas. The CoC has a storage option for the Colorado River. In the case, there may have several alignment potential. So to pursue this option would be very risky for most homes and businesses in Dallas. The CoC has provided guidance, particularly providing the CoC has recommended the Business and Industry to managing flood risk in the CoC. The CoC is investigating the viability of the CoC to alleviate flooding in the CoC.

The CoC has a flood scheme/project-

4.2 Flood Risk from Rivers

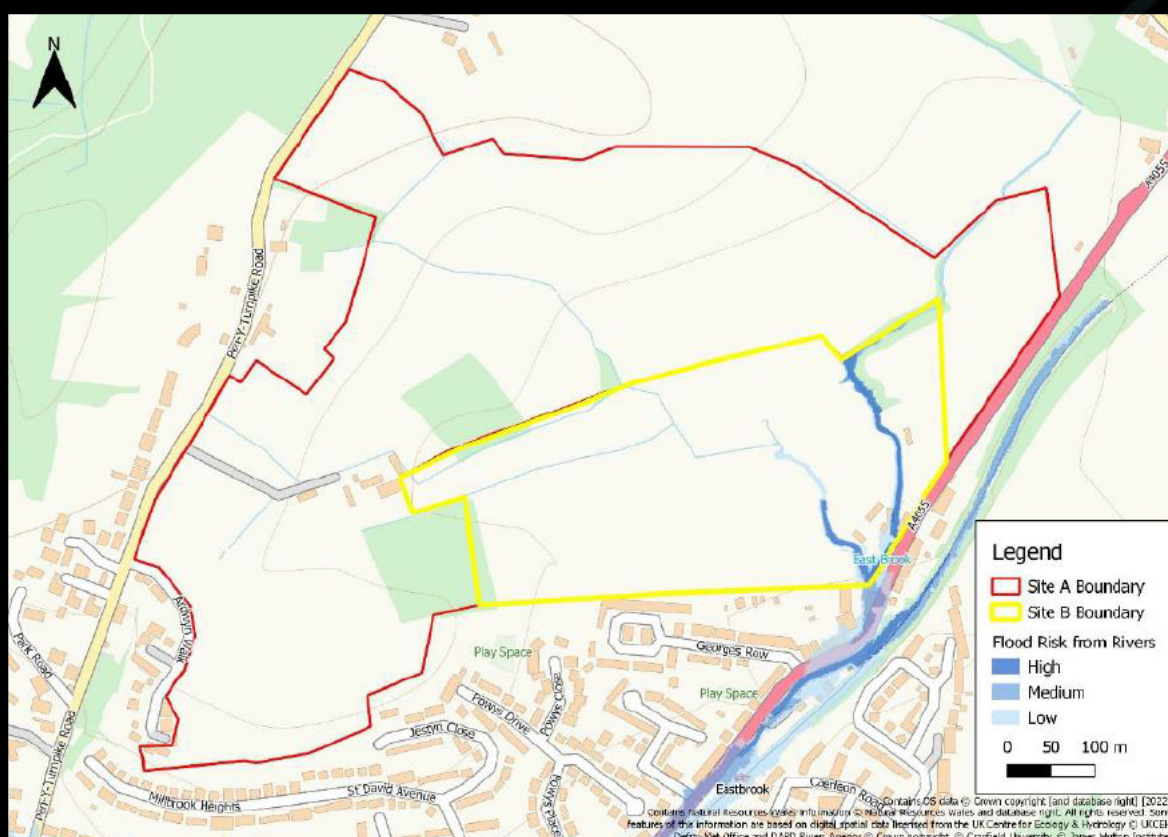


Figure 4-1 FRAW - Flood Risk from Rivers

4.3 Flood Risk from the Sea

4.4 Flood Risk from Surface Water and Small Watercourses

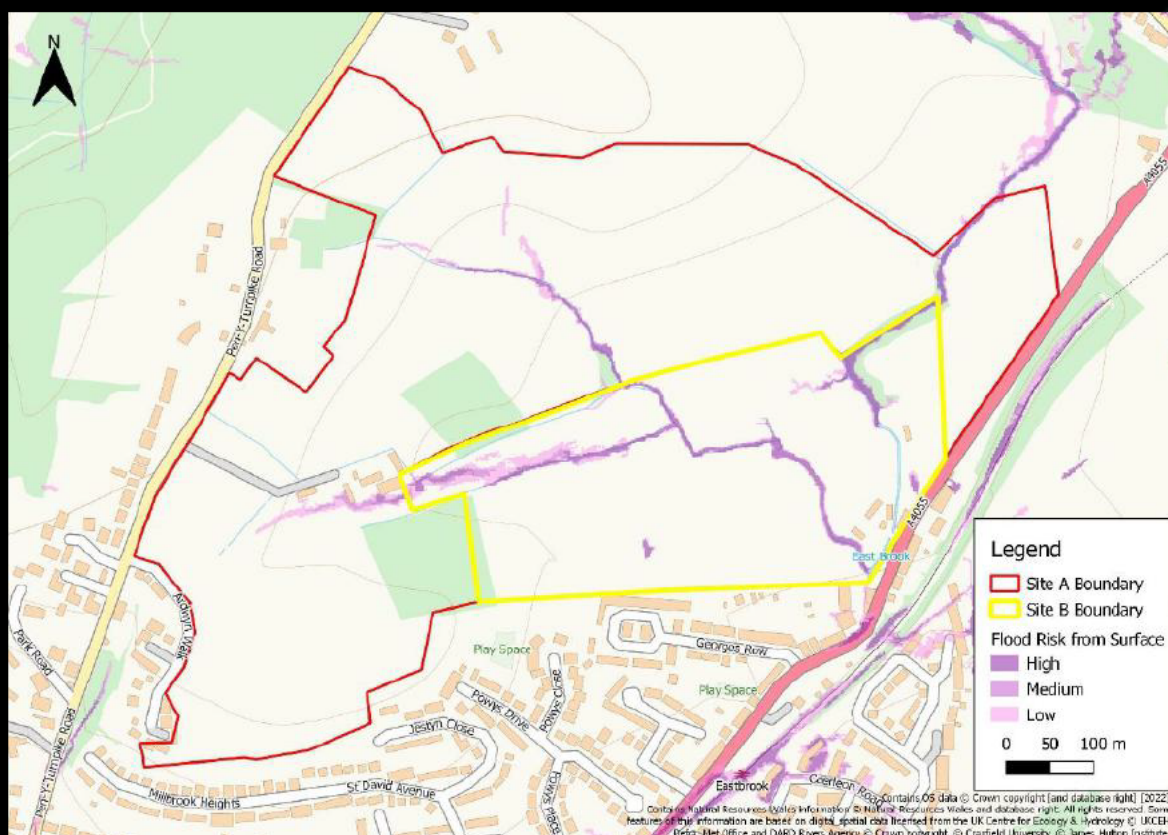


Figure 4-2 FRAW – Flood risk from surface water and small watercourses

5.2 Greenfield runoff rates

Return Period	Specific Runoff (l/s/ha)	Peak Runoff Rate (l/s)
1		
QBAR		
30		
100		10953

5.4 Greenfield runoff volumes

Equation 1: FSSR16 method for calculating Greenfield runoff volumes

Table 5-2 Greenfield rainfall depths and runoff volumes

Return Period	6-hour rainfall runoff depth (mm)	Site runoff volume (m3)
100		
100 plus climate change (20%)		

6 Surface water management approach

6.1 Sustainable drainage systems

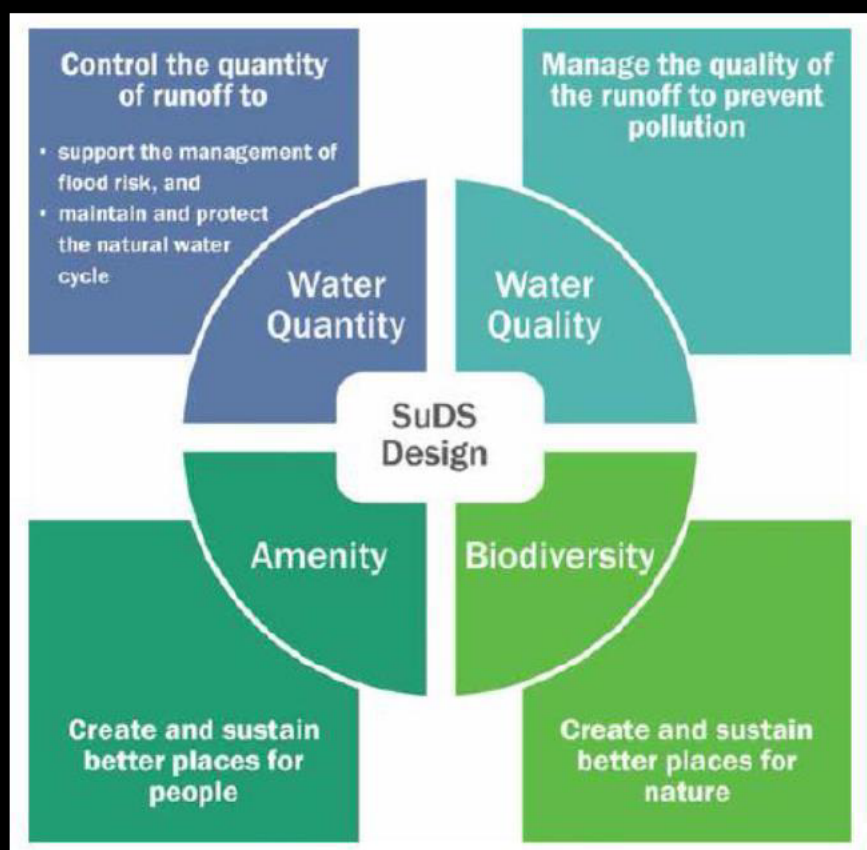


Figure 6-1 Four pillars of SUDS Design (CIRIA, 2015)

6.2 Design criteria

Design criteria and design standards have been considered within the context of the design strategy (see Section 6.1.1.1 Design strategy);

Design criteria for drainage systems – designing, constructing, and maintaining drainage systems (Welsh Government, 2017)

Design criteria for drainage systems – Design and Waste Disposal (Welsh Government, 2017)

Priority Level 1 - Water for re-use

Priority Level 2- Infiltration

Priority Level 5- Discharge to a combined sewer

6.4 S2: Surface Water Runoff Hydraulic Control: Proposed Discharge Rate

The proposed development is designed to meet the requirements of the Sustainable Drainage Systems (SuDS) Regulations 2015, which require the use of SuDS to manage surface water runoff from the development site.

The SuDS design is based on the following assumptions:

- The SuDS system is designed to manage surface water runoff from the development site.
- The SuDS system is designed to meet the requirements of the Sustainable Drainage Systems (SuDS) Regulations 2015.
- The SuDS system is designed to manage surface water runoff from the development site.

6.4.1 Interception of rainfall

The SuDS system is designed to manage surface water runoff from the development site. The SuDS system is designed to meet the requirements of the Sustainable Drainage Systems (SuDS) Regulations 2015. The SuDS system is designed to manage surface water runoff from the development site. The SuDS system is designed to meet the requirements of the Sustainable Drainage Systems (SuDS) Regulations 2015.

6.4.2 Discharge Limits and Attenuation Volume

The SuDS system is designed to manage surface water runoff from the development site. The SuDS system is designed to meet the requirements of the Sustainable Drainage Systems (SuDS) Regulations 2015. The SuDS system is designed to manage surface water runoff from the development site. The SuDS system is designed to meet the requirements of the Sustainable Drainage Systems (SuDS) Regulations 2015.

6.5 S3: Water Quality

The SuDS system is designed to manage surface water runoff from the development site. The SuDS system is designed to meet the requirements of the Sustainable Drainage Systems (SuDS) Regulations 2015. The SuDS system is designed to manage surface water runoff from the development site. The SuDS system is designed to meet the requirements of the Sustainable Drainage Systems (SuDS) Regulations 2015.

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Table 6-1 Pollution hazard indices for the site

Pollution hazard level	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Low			

6.6 S4: Amenity Value

The amenity value of the site is high, due to the presence of the river and the surrounding landscape. The site is located in a rural area, and the surrounding landscape is a mix of agricultural land and woodland. The river is a significant feature of the landscape, and the site is located on the riverbank. The site is also located in a floodplain, which adds to its amenity value. The site is a good example of a rural landscape with a river and floodplain. The site is a good example of a rural landscape with a river and floodplain. The site is a good example of a rural landscape with a river and floodplain.

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6.7 S5: Biodiversity

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6.8 S6: Design for Construction, Maintenance and Structural Integrity

The site is a good example of a rural landscape with a river and floodplain. The site is a good example of a rural landscape with a river and floodplain. The site is a good example of a rural landscape with a river and floodplain. The site is a good example of a rural landscape with a river and floodplain. The site is a good example of a rural landscape with a river and floodplain. The site is a good example of a rural landscape with a river and floodplain. The site is a good example of a rural landscape with a river and floodplain. The site is a good example of a rural landscape with a river and floodplain. The site is a good example of a rural landscape with a river and floodplain. The site is a good example of a rural landscape with a river and floodplain.

6.8.1 Health and Safety

6.8.2 Adoption and Maintenance

6.10 Summary of SuDS viability on site

Table 6-2 Viability of SuDS Techniques on site

SuDS Component	Site Viability	Amenity Benefits	Biodiversity Benefits	Water Quality Benefits	Comments
Rainwater harvesting					
Infiltration systems and soakaways					Soakaway is not viable due to high groundwater levels. Infiltration system is not viable due to high groundwater levels. Soakaway system is not viable due to high groundwater levels.
Filter strips					Opportunity for inclusion within Green Corridors.
Filter drains					Beneficial for use within a greenment area.
Swales					Consideration to be given to covering surface water to basins.
Bioretention systems and rain gardens					Beneficial for use within treatment drains and for implementation of SuDS at site - no additional space required.
Pervious Pavements					Beneficial for use within treatment drains and for implementation of SuDS at site - no additional space required.

Attenuation Storage Tanks
Detention Basins
Pond and Wetlands

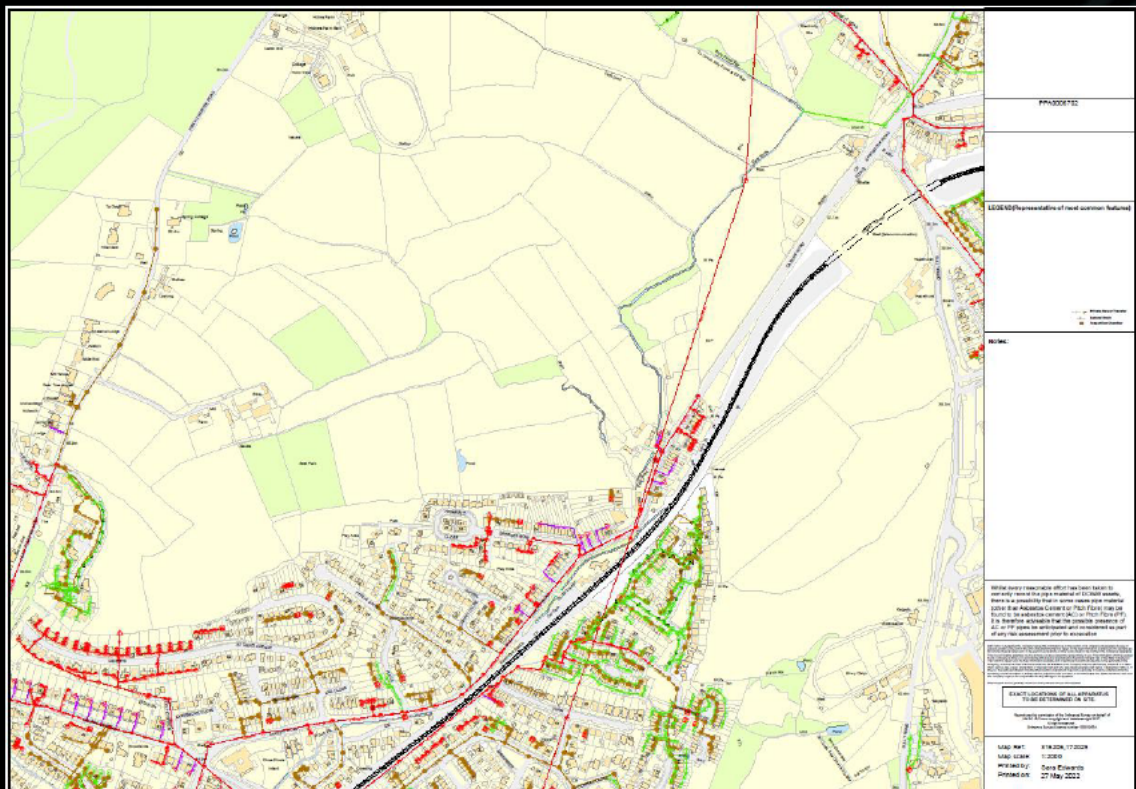
1. **Attenuation Storage Tanks**
 2. **Detention Basins**
 3. **Pond and Wetlands**

7 Foul Drainage

7.1 Building Regulations 2010: Part H: Drainage and Waste Disposal

7.2 DCWW Developer Enquiry Response

Foul Water



Potable Water Supply





Appendices

A Greenfield Runoff Calculations

Calculated by:

Site name:

Site location:

This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013), the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Site Details

Latitude:

Longitude:

Reference:

Date:

Runoff estimation approach

Site characteristics

Total site area (ha):

Methodology

Q_{MED} estimation method:

BFI and SPR method:

HOST class:

BFI / BFIHOST:

Q_{MED} (l/s):

Q_{BAR} / Q_{MED} factor:

Hydrological characteristics

	Default	Edited
SAAR (mm):	<input type="text" value="959"/>	<input type="text" value="1018"/>
Hydrological region:	<input type="text" value="9"/>	<input type="text" value="9"/>
Growth curve factor 1 year:	<input type="text" value="0.88"/>	<input type="text" value="0.88"/>
Growth curve factor 30 years:	<input type="text" value="1.78"/>	<input type="text" value="1.78"/>
Growth curve factor 100 years:	<input type="text" value="2.18"/>	<input type="text" value="2.18"/>
Growth curve factor 200 years:	<input type="text" value="2.46"/>	<input type="text" value="2.46"/>

Notes

(1) Is $Q_{BAR} < 2.0$ l/s/ha?

When Q_{BAR} is < 2.0 l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

(2) Are flow rates < 5.0 l/s?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

(3) Is $SPR/SPRHOST \leq 0.3$?

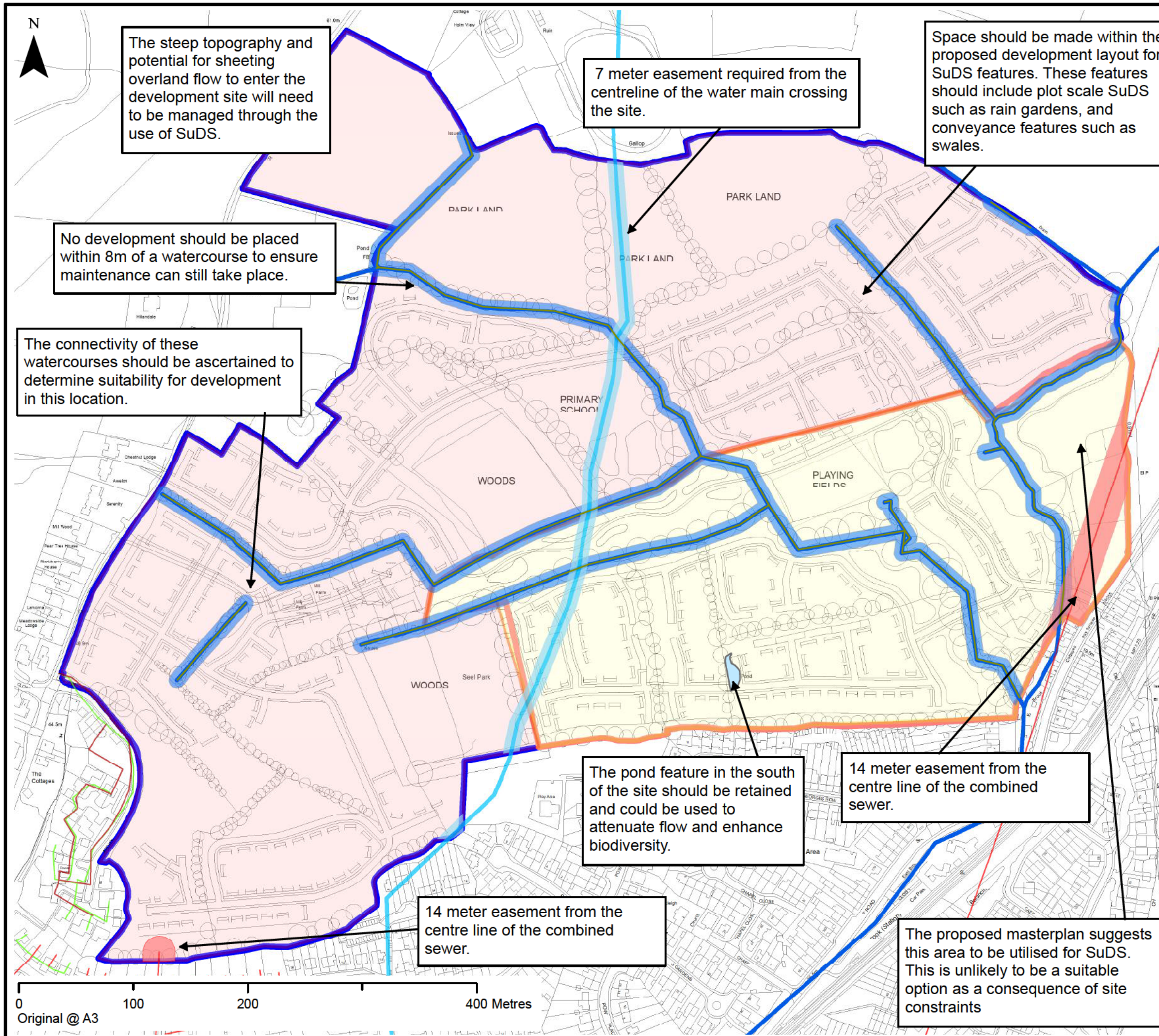
Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

Greenfield runoff rates

	Default	Edited
Q_{BAR} (l/s):	<input type="text"/>	<input type="text" value="502.43"/>
1 in 1 year (l/s):	<input type="text"/>	<input type="text" value="442.13"/>
1 in 30 years (l/s):	<input type="text"/>	<input type="text" value="894.32"/>
1 in 100 year (l/s):	<input type="text"/>	<input type="text" value="1095.29"/>
1 in 200 years (l/s):	<input type="text"/>	<input type="text" value="1235.97"/>

This report was produced using the greenfield runoff tool developed by HR Wallingford and available at www.uksuds.com. The use of this tool is subject to the UK SuDS terms and conditions and licence agreement, which can both be found at www.uksuds.com/terms-and-conditions.htm. The outputs from this tool are estimates of greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, CEH, Hydrosolutions or any other organisation for the use of this data in the design or operational characteristics of any drainage scheme.

B Opportunities and Constraints



KEYPLAN



KEY

- Site boundary-A
- Site boundary-B
- DCWW Assets**
 - Combined
 - Foul
 - Surface Water
 - WW Water main
 - DCWW14m easement for sewer infrastructure
 - DCWW 7m easement for water main infrastructure
- Watercourses**
 - Watercourses
 - 8m watercourse buffer

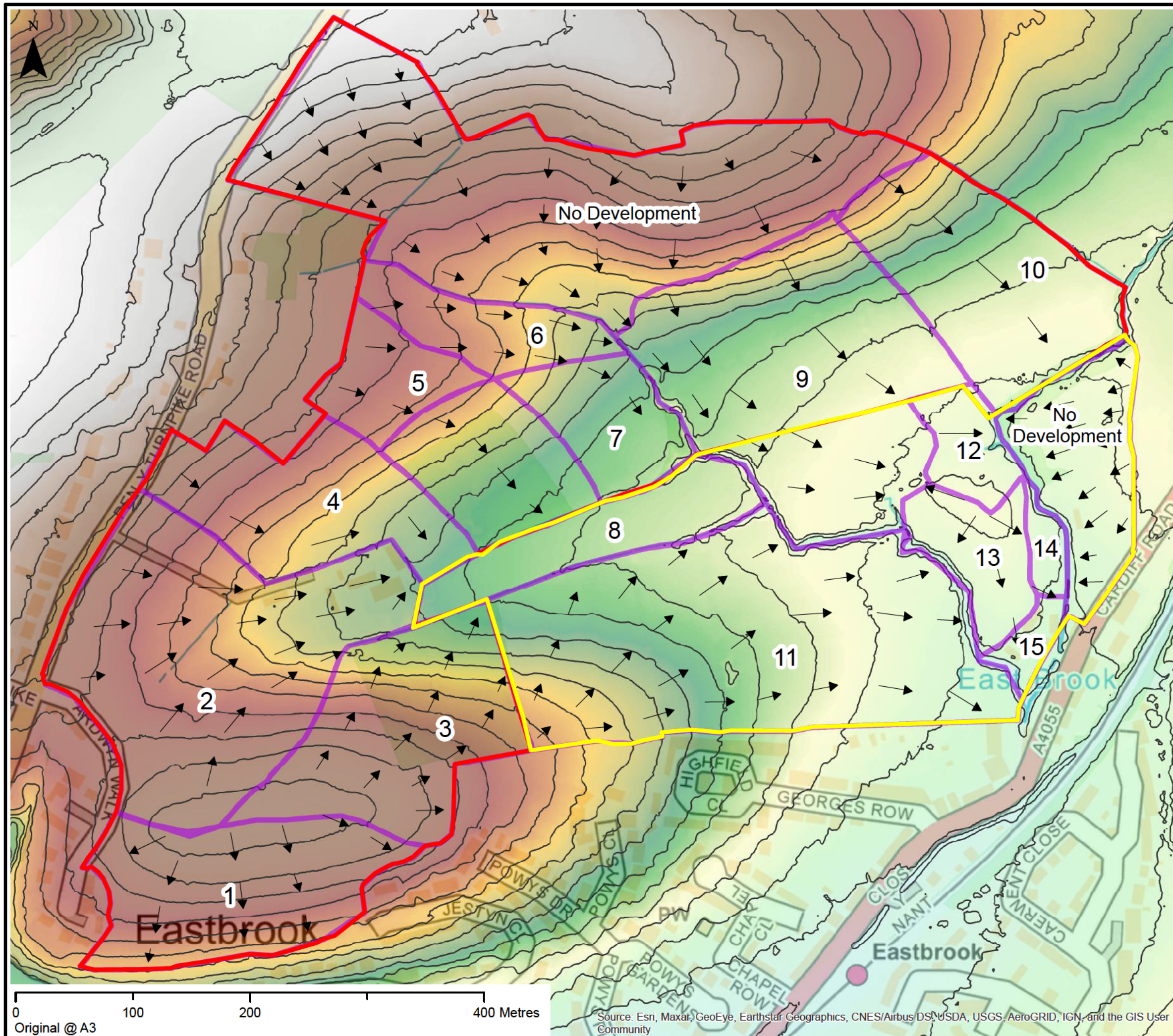
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LAND NORTH OF DINAS POWYS

FLOOD RISK AND DRAINAGE CONSTRAINTS








C Flow routes and development drainage sub catchments



KEYPLAN



KEY

-  Site boundary-A
-  Site boundary-B
-  Flow Direction Arrows
-  2m Contours
- 2m LiDAR**
 -  High : 63
 -  Low : 14
-  Site sub-catchments

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Land north of Dinas Powys
Preliminary Flood Consequence
Assessment & Drainage Strategy

Flow direction and development
site sub-catchments

D Welsh Water Developer Enquiry

Welsh Water Developer Enquiry

Welsh Water Developer Enquiry

Welsh Water Developer Enquiry

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Welsh Water Developer Enquiry

Welsh Water Developer Enquiry



JBA Consulting
8 Kings Court
High Street
Newport
NP20 1FQ

Date: 19/05/2022
Our Ref: PPA0006702

Dear [REDACTED]

Grid Ref: 316236 172029
Site Address: Cardiff Road, Dinas Powys
Development: Residential

Firstly, we note that the proposal relates to a residential development of 2180 units on Cardiff Road, Dinas Powys and acknowledge that the site comprises of a potential windfall development with no allocated status in the Local Development Plan (LDP). Accordingly, whilst it does not appear an assessment has been previously undertaken of the public sewerage system, we offer the following comments as part of our appraisal of this development.

Please note, notwithstanding the following assessment, we would advise there is also a mandatory requirement to undertake pre-application consultation with all 'Specialist Consultees', including Dwr Cymru Welsh Water as the statutory water and sewerage undertaker, in accordance with Schedule 4 of Town & Country Planning (Development Management Procedure) (Wales) (Amendment) Order 2016. As a major development, amounting to more than 10 units, you will be statutorily required to consult Welsh Water and a substantive response will be issued within 28 days from the date of the notice as per the requirements of Article 2E.

Public Sewerage Network

The proposed development site is located in the immediate vicinity of a combined public sewerage system which drains to Cog Moors Wastewater Treatment Works (WwTW).

This site is crossed by a public sewer with the approximate position being marked on the attached Statutory Public Sewer Record. In accordance with the Water Industry Act 1991, Dwr Cymru Welsh Water requires access to its apparatus at all times in order to carry out maintenance and repairs. No part of any building will be permitted within the protection zone of the public sewer measured 14 metres either side of the centreline. Our strong recommendation is that your site layout takes into account the location of the assets crossing the site and should be referred to in any master-planning exercises or site layout plans submitted as part of any subsequent planning application. Further information regarding Asset Protection is provided in the attached Advice & Guidance note.

You are also advised that some public sewers and lateral drains may not be recorded on our maps of public sewers because they were originally privately owned and were transferred into public ownership by nature of the Water Industry (Schemes for Adoption of Private Sewers) Regulations 2011. The presence of such assets may affect the proposal. In order to assist you may contact Dwr Cymru Welsh Water on 0800 085 3968 to establish the location and status of the apparatus in and around your site. Please be mindful that under the Water Industry Act 1991 Dwr Cymru Welsh Water has rights of access to its apparatus at all times.

Surface Water Drainage

As of 7th January 2019, this proposed development is subject to Schedule 3 of the Flood and Water Management Act 2010. The development therefore requires approval of Sustainable Drainage Systems (SuDS) features, in accordance with the 'Statutory standards for sustainable drainage systems – designing, constructing, operating and maintaining surface water drainage systems'. As highlighted in these standards, the developer is required to explore and fully exhaust all surface water drainage options in accordance with a hierarchy which states that discharge to a combined sewer shall only be made as a last resort. Disposal should be made through the hierarchical approach, preferring infiltration and, where infiltration is not possible, disposal to a surface water drainage body in liaison with the Land Drainage Authority and/or Natural Resources Wales.

It is therefore recommended that the developer consult with Vale of Glamorgan Council, as the determining SuDS Approval Body (SAB), in relation to their proposals for SuDS features. Please note, DCWW is a statutory consultee to the SAB application process and will provide comments to any SuDS proposals by response to SAB consultation. Please refer to further detailed advice relating to surface water management included in our attached Advice & Guidance note. In addition, please note that no highway or land drainage run-off will be permitted to discharge directly or indirectly into the public sewerage system.

Foul Water Drainage – Sewerage Network

We have considered the impact of foul flows generated by the proposed development and concluded it is unlikely that sufficient capacity exists to accommodate your development without causing detriment to the existing services we provide to our customers, or in regard to the protection of the environment. There are no planned reinforcement works within Dwr Cymru Welsh Water's Capital Investment Programme and therefore, at this stage, we are unable to provide you with a point of adequacy on the network.

In light of the above our recommendation is that you instruct us to undertake a Hydraulic Modelling Assessment (HMA) which is at the developer's expense and will examine the impact of the introduction of flows from your development upon the performance of the existing network and consider. Where required and appropriate, the HMA will then identify solutions and points of communication to ensure that your site can be accommodated within the system. For the developer to obtain a quotation for the HMA, we will require a fee of £250 + VAT. Please note that we will seek to control the outcomes of the HMA via appropriate planning conditions.



Welsh Water is owned by Glas Cymru – a 'not-for-profit' company.
Mae Dwr Cymru yn eiddo i Glas Cymru – cwmni 'nid-er-elw'.

We welcome correspondence in
Welsh and English

Dŵr Cymru Cyf, a limited company registered in
Wales no 2366777. Registered office: Pentwyn Road,
Nelson, Treharris, Mid Glamorgan CF46 6LY

Rydym yn croesawu gohebiaeth yn y
Gymraeg neu yn Saesneg

Dŵr Cymru Cyf, cwmni cyfyngedig wedi'i gofrestru yng
Nghymru rhif 2366777. Swyddfa gofrestredig: Heol Pentwyn
Nelson, Treharris, Morgannwg Ganol CF46 6LY.

However, in the absence of known solutions to accommodate your site we will not be able to support your development through the planning process. We therefore recommend that the HMA is undertaken in advance of a planning application being submitted, in order to avoid any subsequent delays. Further information on Hydraulic Modelling Assessments as well as any implications on the planning process is provided in the attached Advice & Guidance note.

Alternatively, given that the site is located in the vicinity of a combined sewer, the developer may wish to investigate and explore any opportunities to remove surface water flows from the existing public sewerage system which may provide sufficient compensation for the foul flows generated by the proposed development. Should the developer wish to explore this option, we recommend that any scheme/strategy is provided, preferably in advance of a planning application being submitted, in order for us to assess whether suitable as a solution to accommodate foul flows from the proposed development into the public sewerage system.

You may need to apply to Dwr Cymru Welsh Water for any connection to the public sewer under Section 106 of the Water Industry Act 1991. However, if the connection to the public sewer network is either via a lateral drain (i.e. a drain which extends beyond the connecting property boundary) or via a new sewer (i.e. serves more than one property), it is now a mandatory requirement to first enter into a Section 104 Adoption Agreement (Water Industry Act 1991). The design of the sewers and lateral drains must also conform to the Welsh Ministers Standards for Foul Sewers and Lateral Drains, and conform with the publication "Sewers for Adoption"- 7th Edition. Further information can be obtained via the Developer Services pages of www.dwrcymru.com.

Foul Water Drainage – Sewage Treatment

No problems are envisaged with the Wastewater Treatment Works for the treatment of domestic discharges from this site.

Potable Water Supply

The proposed development is in an area where there are water supply problems for which there are no improvements planned within our current Capital Investment Programme AMP7 (years 2020 to 2025). In order to establish what would be required to serve the site with an adequate water supply, it will be necessary for the developer to fund the undertaking of a hydraulic modelling assessment on the water supply network. For the developer to obtain a quotation for the hydraulic modelling assessment, we will require a fee of £250 + VAT.

The proposed development is crossed by a trunk watermain, the approximate position being shown on the attached plan. Dwr Cymru Welsh Water as Statutory Undertaker has statutory powers to access our apparatus at all times. I enclose our Conditions for Development near Watermain(s). It may be possible for this watermain to be diverted under Section 185 of the Water Industry Act 1991, the cost of which will be re-charged to the developer. The developer must consult Dwr Cymru Welsh Water before any development commences on site.



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Rydym yn croesawu gohebiaeth yn y
Gymraeg neu yn Saesneg

Dŵr Cymru Cyf, cwmni cyfyngedig wedi'i gofrestru yng
Nghymru rhif 2366777. Swyddfa gofrestredig: Heol Pentwyn
Nelson, Treharris, Morgannwg Ganol CF46 6LY.

I trust the above information is helpful and will assist you in forming water and drainage strategies that should accompany any future planning application. I also attach copies of our water and sewer extract plans for the area, and a copy of our Planning Guidance Note which provides further information on our approach to the planning process, making connections to our systems and ensuring any existing public assets or infrastructure located within new development sites are protected.

Please note that our response is based on the information provided in your enquiry and should the information change we reserve the right to make a new representation. Should you have any queries or wish to discuss any aspect of our response please do not hesitate to contact our dedicated team of planning officers, either on 0800 917 2652 or via email at developer.services@dwrcymru.com

Please quote our reference number in all communications and correspondence.

[Redacted]



[Redacted]

Planning Liaison Manager
Developer Services

Please Note that demands upon the water and sewerage systems change continually; consequently, the information given above should be regarded as reliable for a maximum period of 12 months from the date of this letter

PPA0006702

CONDITIONS FOR DEVELOPMENT NEAR WATER MAINS

Location: Dinas Powys
Date: 19.05.22

The development of the site with our water main located as shown on the attached plan will involve certain conditions which must be strictly adhered to. These are:-

1. No structure is to be sited within a minimum distance of **7m** from the centre line of the mains. The pipeline must therefore be located and marked up accurately at an early stage so that the Developer or others understand clearly the limits to which they are confined with respect to the Company's apparatus. Arrangements can be made for Company staff to trace and peg out such water mains on request of the Developer.
2. Adequate precautions are to be taken to ensure the protection of the water main during the course of site development.
3. If heavy earthmoving machinery is to be employed, then the routes to be used in moving plant around the site should be clearly indicated. Suitable ramps or other protection will need to be provided to protect the water main from heavy plant.
4. The water main is to be kept free from all temporary buildings, building material and spoil heaps etc.
5. The existing ground cover on the water main should not be increased or decreased.
6. All chambers, covers, marker posts etc. are to be preserved in their present position.
7. Access to the Company's apparatus must be maintained at all times for inspection and maintenance purposes and must not be restricted in any way as a result of the development.
8. No work is to be carried out before this Company has approved the final plans and sections.

These are general conditions only and where appropriate, will be applied in conjunction with specific terms and conditions provided with our quotation and other associated documentation relating to this development.



Dŵr Cymru
Welsh Water

PPA0006702



LEGEND(Representative of most common features)

Waste network:	Foul chamber	Outfall
Surface water chamber	Lamphole	Storm Overflow
Combined chamber	Rising main	Gravity sewer
Combined sewer overflow	Private sewer	Private sewer subject to Sect. 104 adoption agreement
Special purpose chamber	Private Sewer Transfer	Lateral Drain
Treatment works	Inspection Chamber	
Pumping station		

NB: Sewer symbol colour indicates the type.
RED - Combined
GREEN - Surface Water
BROWN - Foul
Purple - Former S24 sewers (for indicative purposes only)

Notes:

Whilst every reasonable effort has been taken to correctly record the pipe material of DCWW assets, there is a possibility that in some cases pipe material (other than Asbestos Cement or Pitch Fibre) may be found to be asbestos cement (AC) or Pitch Fibre (PF). It is therefore advisable that the possible presence of AC or PF pipes be anticipated and considered as part of any risk assessment prior to excavation

Dŵr Cymru Cyf (the Company) gives this information as to the position of its underground apparatus by way of general guidance only and on the strict understanding that it is based on the best information available and no warranty as to its correctness is made upon the event of excavations or other works made in the vicinity of the Company's apparatus. The onus of locating apparatus before carrying out any excavations rests entirely on you. The information which is supplied by the Company is done so in accordance with statutory requirements of sections 195 and 199 of the Water Industry Act 1991 which is based upon the best information available and, in particular, but without prejudice to the generality of the foregoing, it should be noted that the records that are available to the Company may not disclose the existence of a water main, service pipe, sewer, lateral drain or disposal main and any associated apparatus laid before 1 September 1989, or, if they do, the particulars thereof including their position underground may not be accurate. It must be understood that the furnishing of this information is entirely without prejudice to the provisions of the New Roads and Street Works Act 1991 and the Company's right to be compensated for any damage to its apparatus.

Service pipes are not generally shown but their presence should be anticipated.

**EXACT LOCATIONS OF ALL APPARATUS
TO BE DETERMINED ON SITE.**

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Map scale: 1:2000
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Printed on: 27 May 2022



Dŵr Cymru
Welsh Water

PPA0006702



LEGEND

Clean network:

	Sluice valve		Stop tap
	Pressure reducing valve		Water Treatment Works
	Meter		Water Pumping Station
	Bulk meter		Existing main
	Hydrant		Non-operational main
	Cap end		Raw Water
	Air valve		

NB: Water main symbol colour indicates the type.
LIGHT BLUE - Trunk
DARK BLUE - Distribution
YELLOW - Raw Water

Notes:

Whilst every reasonable effort has been taken to correctly record the pipe material of DCWW assets, there is a possibility that in some cases pipe material (other than Asbestos Cement or Pitch Fibre) may be found to be asbestos cement (AC) or Pitch Fibre (PF). It is therefore advisable that the possible presence of AC or PF pipes be anticipated and considered as part of any risk assessment prior to excavation

Dŵr Cymru Cyfyngedig (the Company) gives this information as to the position of its underground apparatus by way of general guidance only and on the strict understanding that it is based on the best information available and no warranty as to its correctness is relied upon in the event of excavations or other works made in the vicinity of the company's apparatus. The onus of locating apparatus before carrying out any excavations rests entirely on you. The information which is supplied by the Company is done so in accordance with statutory requirements of sections 168 and 169 of the Water Industry Act 1991 which is based upon the best information available and any associated apparatus laid before 1 September 1988, or if they do, the particulars thereof including their position underground may not be accurate. It must be understood that the furnishing of this information is entirely without prejudice to the provisions of the New Roads and Street Works Act 1991 and the Company's right to be compensated for any damage to its apparatus.

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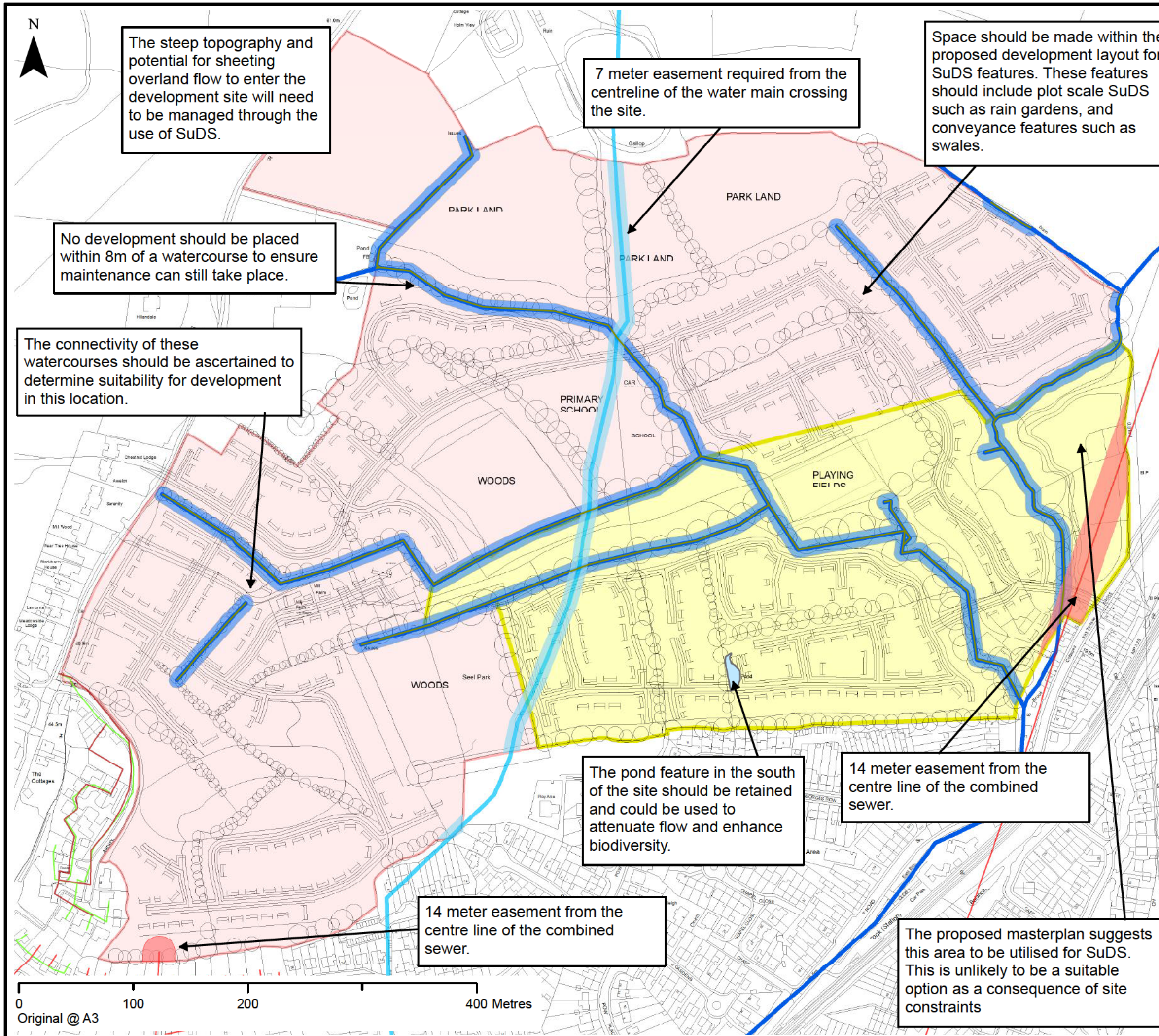
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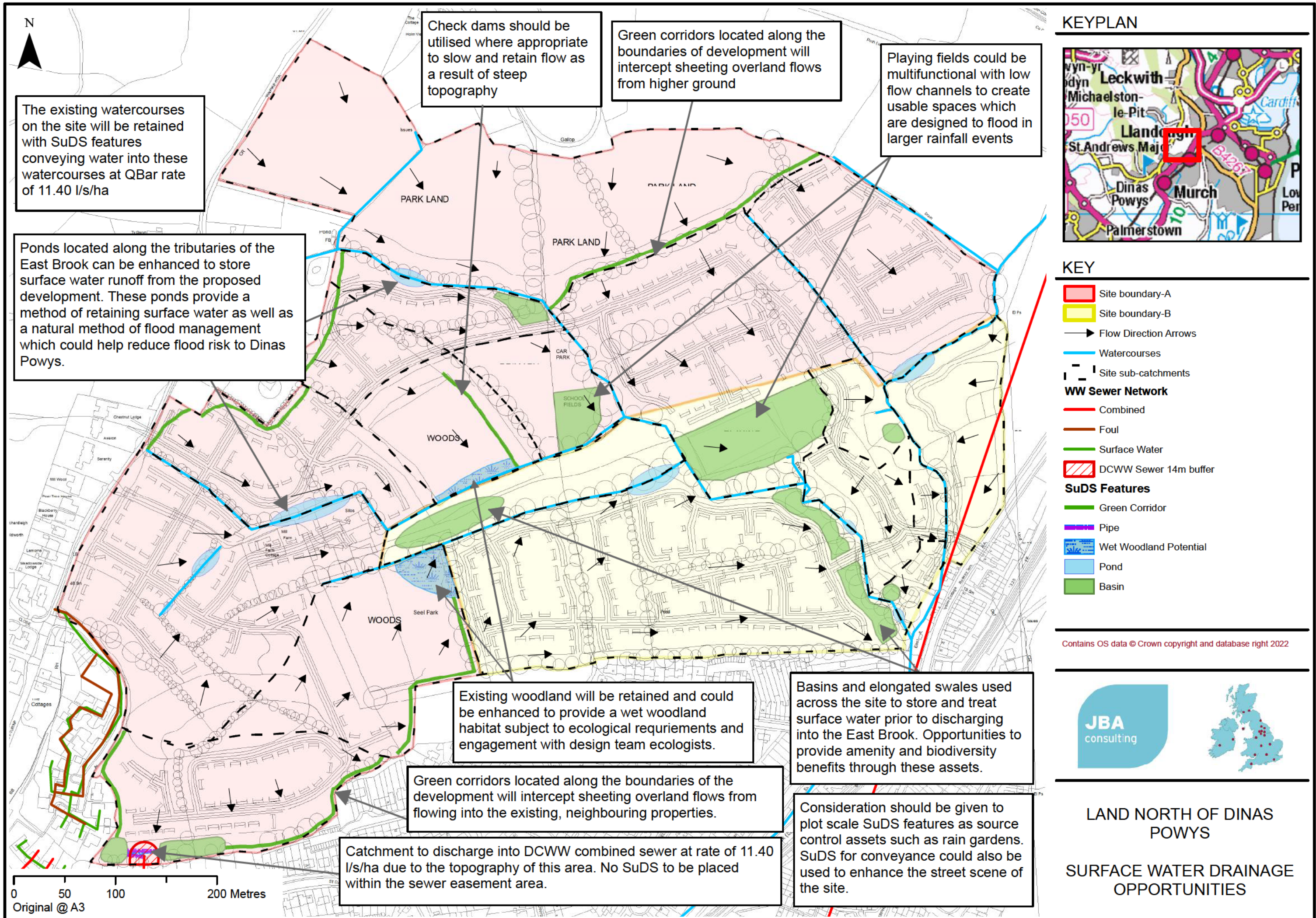
KEY

- Site boundary-A
- Site boundary-B
- DCWW Assets**
 - Combined
 - Foul
 - Surface Water
 - WW Water main
- DCWW 14m easement for sewer infrastructure
- DCWW 7m easement for water main infrastructure
- Watercourses**
 - Watercourses
 - 8m watercourse buffer

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LAND NORTH OF DINAS
POWYS
FLOOD RISK AND DRAINAGE
CONSTRAINTS



KEYPLAN



KEY

- Site boundary-A
- Site boundary-B
- Flow Direction Arrows
- Watercourses
- Site sub-catchments
- WW Sewer Network**
 - Combined
 - Foul
 - Surface Water
 - DCWW Sewer 14m buffer
- SuDS Features**
 - Green Corridor
 - Pipe
 - Wet Woodland Potential
 - Pond
 - Basin

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LAND NORTH OF DINAS POWYS

SURFACE WATER DRAINAGE OPPORTUNITIES