



WILSFORD DOWN COTTAGE

Wilsford, Wiltshire

FLOOD RISK ASSESSMENT

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Control Sheet

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Prepared by	Signature	Date
Cory Foster BSc Graduate Flood Risk Consultant		23/05/2024

Reviewed by	Signature	Date
Patrick Goodey BSc MSc Head of Flood Risk & Hydrology		23/05/2024

Approved for issue by	Signature	Date
Patrick Goodey BSc MSc Head of Flood Risk & Hydrology		23/05/2024

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1 EXECUTIVE SUMMARY

- 1.1.1 Planning permission is being sought to change the use of an agricultural building to a residential dwelling. There will therefore be no alteration to the impermeable footprint of the site. The existing access from the road to the north will be retained.
- 1.1.2 This document considers the flood risk to the site from all sources, including groundwater flooding, on the request of the Local Planning Authority.
- 1.1.3 The site is located in Flood Zone 1 and outside of areas predicted to be at risk of surface water flooding. Due to the rural position of the site, together with absence of nearby artificial water bodies, it is at negligible risk from sewers or artificial sources.
- 1.1.4 The Wiltshire SFRA mapping predicts that groundwater could be close to the surface during a 1 in 100 year event (design flood conditions).
- 1.1.5 GeoSmart Groundwater Flood Risk data (analysed in accordance with the SFRA recommendations) predicts the site and surrounding areas to be at low risk of groundwater flooding.
- 1.1.6 The change of use nature of the development would have negligible impact on local drainage.
- 1.1.7 As a result of the above, no specific mitigation measures are required by the site proposals.
- 1.1.8 This Flood Risk Assessment shows that the development will be safe for its lifetime and have negligible impact on drainage. As such it therefore meets the requirements of the NPPF and PPG.

2 INTRODUCTION

2.1 Background

2.1.1 Calibro has been appointed by *RAW Planning* to undertake a Flood Risk Assessment (FRA) for a change of use from an agricultural barn to residential accommodation.

2.1.2 The National Planning Policy Framework (NPPF) requires that the planning system takes full account of flood risk. This requires that:

- A 'site specific' FRA will be undertaken for any site that has a flood risk potential;
- Flood risk potential is minimised by applying a 'sequential approach' to locating 'vulnerable' land uses;
- Sustainable drainage systems are used for surface water management where practicable;
- Where identified, flood risk is managed through the use of flood resilient and resistant techniques;
- Residual risk is identified and safely managed;
- Safe access and egress to and from the development can be achieved.

2.1.3 NPPF states that a site-specific FRA will be required for proposals:

- a) that are greater than 1 hectare in area within Flood Zone 1;
- b) that are located in Flood Zones 2 and 3;
- c) in an area within Flood Zone 1 which has critical drainage problems;
- d) in an area within Flood Zone 1 identified in a Strategic Flood Risk Assessment as being at flood risk now or in the future;
- e) in an area in Flood Zone 1 that may be subject to other sources of flooding, where its development would introduce a more vulnerable use.

2.1.4 The site falls within Flood Zone 1 and is less than 1ha but falls within an area identified by the Wiltshire Strategic Flood Risk Assessment (SFRA) as having groundwater flooding potential. It is for this reason that the Local Planning Authority (LPA) has requested the proposals are supported by an FRA.

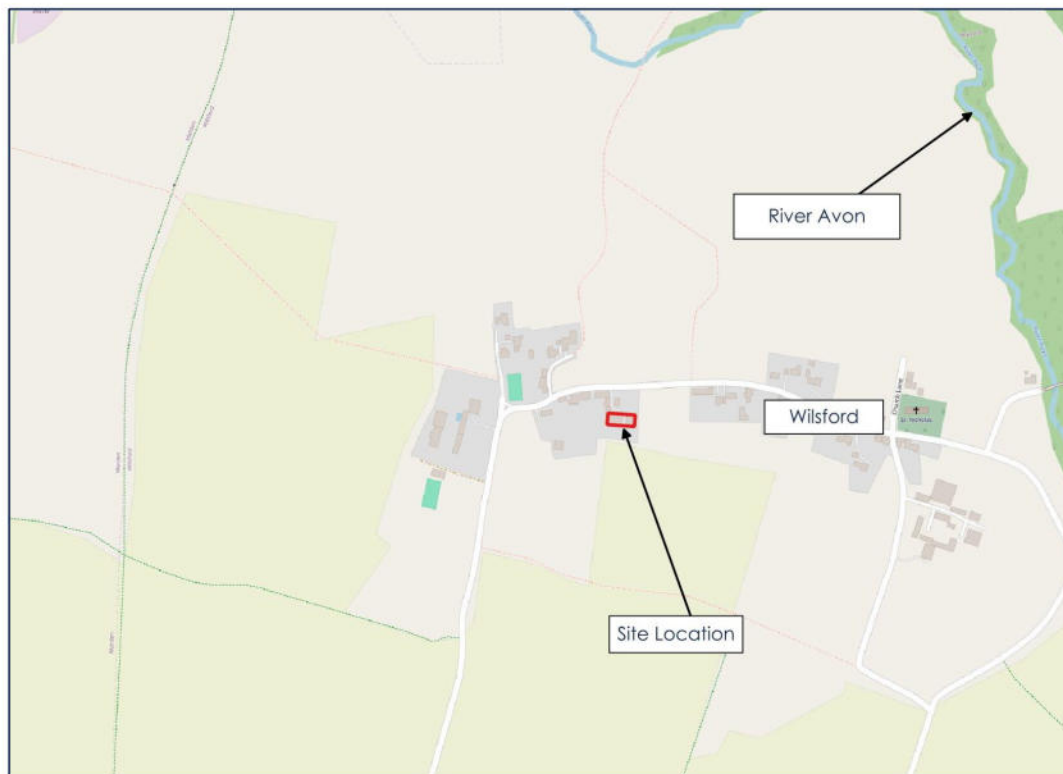
2.1.5 This assessment considers the risks of all types of flooding to the site for the lifetime of the development and assess if there would be an impact of flooding to third parties, recommending mitigation if a risk is identified.

3 EXISTING SITE AND HYDROLOGY CHARACTERISTICS

3.1 Site Description

- 3.1.1 The site is located in the village Wilsford, Wiltshire. The approximate coordinates at the centre of the site are 409840,157210, the nearest postcode for the site is SN9 6HB. The site is confined to the outline of the existing ancillary outbuilding and measures approximately 530m². Figure 3-1 shows the local context of the site.

Figure 3-1 Local Context



- 3.1.2 The site is currently occupied by an ancillary outbuilding attached to a residential property with access from the north via the existing site entrance along an unnamed road.
- 3.1.3 The site contains a yard which is formed from bound material, likely to be concrete slabs.

3.2 Hydrology and Topography

- 3.2.1 There are no named watercourses in the immediate vicinity of the site. There are a series of field drains present around the site as shown in Figure 3-2.

Figure 3-2 Hydrology



- 3.2.2 In the absence of a topographic survey of the site, readily available LiDAR data has been used to establish the site topography, which is demonstrated in Figure 3-3.
- 3.2.3 As shown in Figure 3-3, the site topography is relatively flat, with levels at the site ranging between 103.5m and 104m. the field to the south of the site consists of similar levels and is relatively flat.

Figure 3-3 Topography



3.3 Geology and Soils

- 3.3.1 Geological data held by the British Geological Survey (BGS) show that entire site is underlain by 'Upper Greensand Formation – Sandstone Glauconitic' sandstone, but it is close to the interface with 'West Melbury Marly Chalk', as shown by Figure 3-4.

Figure 3-4 BGS Geology



- 3.3.2 The BGS Hydrogeology aquifer classification (625k) records the sandstone geology under the site and immediate surrounding areas being a '*Moderately productive Aquifer*'. The chalk to the south of the site is classified as a '*Highly productive Aquifer*', as shown in Figure 3-5.

Figure 3-5 BGS Hydrogeology



- 3.3.3 There are no BGS records of superficial deposits at the site.
- 3.3.4 There are no known boreholes located in vicinity of the site.
- 3.3.5 No springs are identified by relevant OS mapping within the vicinity of the site or the transition between geologies to the south. This suggests that the aquifer does not yield significant volumes of groundwater in this location.
- 3.3.6 SoilScapes Mapping records the soil type beneath the site as being '*Freely draining slightly acid loamy soils*'. The mapped soils to the south of the site in the area underlain by chalk are as '*Freely draining lime-rich loamy soils*'

4 PROPOSED DEVELOPMENT

4.1 Site Proposals

- 4.1.1 The proposals are for a change of use from an ancillary outbuilding to a residential dwelling. The works will comprise the refurbishment and modernisation of the building and its interior with no amendments to the building or impermeable footprint. No basement accommodation is proposed.
- 4.1.2 The proposals will utilise the existing access to the road to the north of the site.

4.2 Development Vulnerability

- 4.2.1 Table 2 of the Flood Risk and Coastal Change Planning Practice Guidance (PPG) defines which types of development are acceptable in each flood zone and is reproduced in Table 4-1. In accordance with Annex 3 of the NNPF, the proposals are considered to be More Vulnerable. All forms, including More Vulnerable, of development are appropriate in Flood Zone 1.

Table 4-1 Flood Risk Vulnerability

Flood Zone	Flood Risk Vulnerability				
	Essential Infrastructure	Highly Vulnerable	More Vulnerable	Less Vulnerable	Water Compatible
1	✓	✓	✓	✓	✓
2	✓	Exception Test Required	✓	✓	✓
3a	Exception Test Required	✗	Exception Test Required	✓	✓
3b	Exception Test Required	✗	✗	✗	✓

4.3 Sequential Test and Exception Test

- 4.3.1 The site is for a change of use. Consequently, neither the Sequential nor Exception Tests need be applied.

5 FLOOD RISK

5.1 National Planning Policy Framework (NPPF)

5.1.1 In accordance with the NPPF, this FRA considers the following sources of flooding:

1. Tidal Flooding – from the sea;
2. Fluvial Flooding – from rivers and streams;
3. Surface Water Flooding – from intense rainfall events;
4. Groundwater flooding – from elevated groundwater levels or springs;
5. Flooding from sewers – from existing sewer systems; and
6. Artificial sources – from reservoirs, canals etc.

5.2 Flood Zones

5.2.1 The Flood Zones are based on the assessed probability of the site flooding from rivers and the sea, ignoring the presence of flood defences. The flood zone classifications from the PPG are presented in Table 5-1 below.

5.2.2 The Flood Map for Planning defines the site as falling entirely within Flood Zone 1, meaning the site is at **Low** risk of fluvial flooding.

Table 5-1 Flood Zone Classification

Flood Zone	Risk	Fluvial Flooding Chance	Tidal Flooding Chance
1	Low	> 1 in 1,000 year	
2	Medium	Between 1 in 100 and 1 in 1,000 year	Between 1 in 200 and 1 in 1,000 year
3	High	Up to 1 in 100 year	Up to 1 in 200 year
3b	Functional Floodplain	Land where water has to flow or be stored in times of flood. This is defined in the relevant SFRA.	

5.3 Recorded Flooding

5.3.1 The EA 'Recorded Flood Outlines' dataset records no historic flood events in the vicinity of the site.

5.3.2 A search of British Hydrological Society's Chronology of British Hydrological Events (CBHE) yielded no relevant flood records.

5.4 Surface Water Flooding

- 5.4.1 The Risk of Flooding from Surface Water (RoFSW) dataset indicates areas where surface water is likely to flow and accumulate. The dataset predicts that the site is at **Very Low** risk of surface water flooding (Figure 5-1).

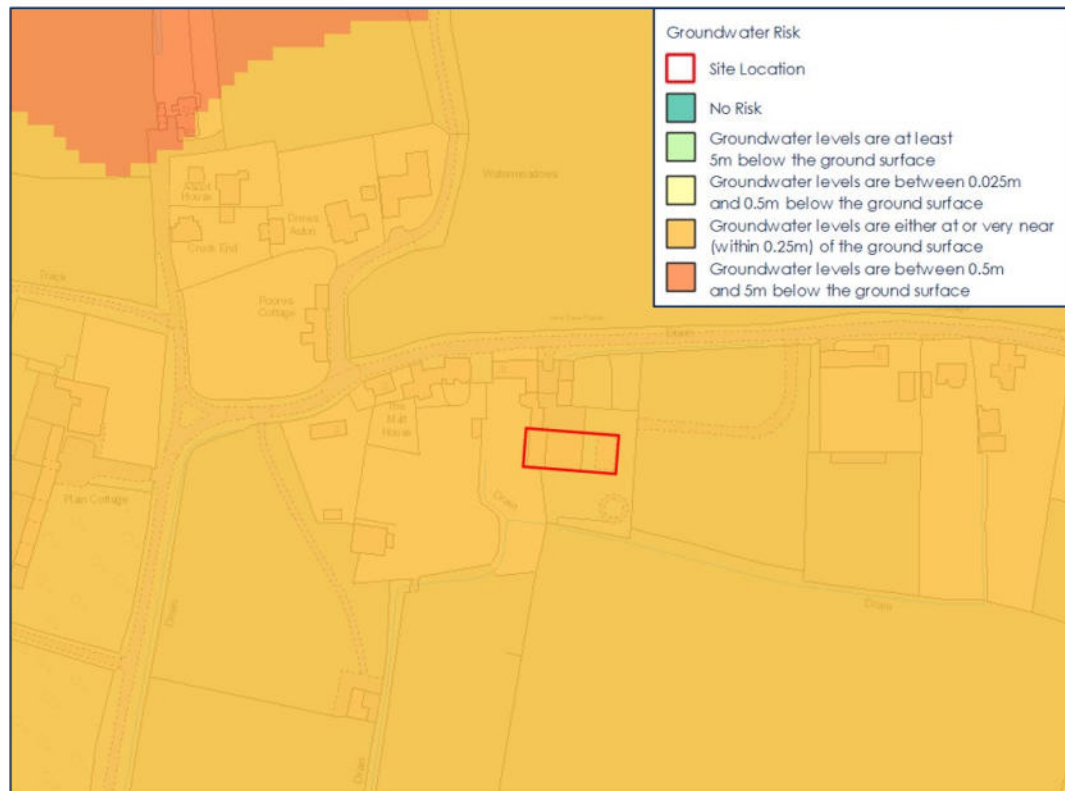
Figure 5-1 RoFSW



5.5 Groundwater Flooding

- 5.5.1 The Wiltshire SFRA and its accompanying online Data Explorer contains a Risk of Groundwater Flooding Map that predicts the proximity of groundwater to the ground surface during a 1 in 100 year event. The outputs of the mapping are shown in Figure 5-2.

Figure 5-2 Wiltshire SFRA Data Explorer - Groundwater



- 5.5.2 As shown in Figure 5-2, the site is located in an area where groundwater levels are expected to be either at or very near (within 0.25m) of the ground surface.
- 5.5.3 However, it is understood the Groundwater Flood Map dataset does not take into account local topography or groundwater levels.
- 5.5.4 Furthermore, the SFRA reporting confirms that the mapping *'should be used in combination with other information, such as local data or historic data. It should not be used as sole evidence for any specific flood risk management, land use planning or other decisions at any scale. The data can however help to identify areas for further assessment at a local scale, where finer resolution datasets may exist or more data could be gathered.'*
- 5.5.5 Accordingly, to further refine the assessment of groundwater flooding, the GeoSmart Groundwater Flood Risk Map has been obtained for the site.

5.6 GeoSmart Groundwater Flood Risk Map

- 5.6.1 GeoSmart data considers topographical and groundwater level data to inform the assessment, together with bespoke hydrogeological and risk models to provide a more accurate assessment of the likely risk of groundwater flooding. The model is calibrated and validated using a national database of recorded groundwater flood events collated by GeoSmart from various sources. The outputs at the site are shown in Figure 5-3.

Figure 5-3 GeoSmart Groundwater Flood Risk



- 5.6.2 The GeoSmart data shows the site and immediate vicinity lies within a large area of Low risk.
- 5.6.3 GeoSmart defines the Low risk band as having ‘a Low risk of groundwater flooding in this area with a chance of 1% annual probability of occurrence or greater (1 in 100 year, typically considered to be the design event)’.
- 5.6.4 Furthermore, the definition of low risk states that groundwater flooding will likely be limited to seepages and waterlogged ground, damage to basements and subsurface infrastructure, and should pose no significant risk to life.
- 5.6.5 As a result, the risk to the site from groundwater sources is considered to be **Low**. Nonetheless, on account of the gentle sloping nature of the site, if groundwater did emerge, it has the potential to pond at the site. Consequently, proportionate mitigation is proposed to minimise the impact of potential flooding and is described in Section 6.

5.7 Flooding from Sewers

- 5.7.1 The area upstream of the site is predominantly rural and therefore unlikely to be served by a significant sewer network. Consequently, the risk of sewer flooding is therefore considered to be **Negligible**.

5.8 Flooding from Artificial Sources

- 5.8.1 The Environment Agency 'Reservoir Flood Extents – Wet Day' national dataset does not predict flooding in the vicinity of the site. No other artificial sources of flood risk have been identified in the vicinity of the site.
- 5.8.2 The risk of flooding from artificial sources is concluded to be **Negligible**.

5.9 Impact on Drainage

- 5.9.1 The proposals are for a change of use of an existing building. There will be no alteration to the impermeable footprint and consequently the impact on local drainage would be **Negligible**.

6 MITIGATION

- 6.1.1 The proposed development is located in an area of Low risk of groundwater flooding according to GeoSmart groundwater data, this band of risk is defined as having an annual probability occurrence of 1% or greater.
- 6.1.2 The damages associated with the aforementioned risk banding are limited to seepages and waterlogged ground, damage to basements and subsurface infrastructure, but should pose no significant risk to life.
- 6.1.3 As a result of the damages associated with a low risk of groundwater flooding, it is unsuitable for the development to construct a basement.
- 6.1.4 In order to minimise the impact of above ground flooding, property flood resilience measures are recommended. Measures could include using washable floors (e.g., tiled flooring) on the ground floor and ensuring electrical connections such as sockets are raised at least 150mm above the ground.
- 6.1.5 Finished floor levels could be slightly increased through nominal raising of internal slab levels.
- 6.1.6 The above measures are subject to wider design and construction issues such as ceiling heights and level access.
- 6.1.7 Drainage channels such as ACO Drainage Channels (or similar approved) could be installed around the building to help redirect water away from the walls and mitigate against seepages. These would connect to existing drainage infrastructure but would be subject to landscaping considerations.

7 SUMMARY

- 7.1.1 It is proposed to convert an existing ancillary outbuilding to a residential dwelling with no alteration to the impermeable footprint of the site.
- 7.1.2 The site is situated on relatively flat land.
- 7.1.3 The site is located in Flood Zone 1 and outside of areas predicted to be at risk of surface water flooding. Due to the rural position of the site, together with absence of nearby artificial water bodies, it is at negligible risk from sewers or artificial sources.
- 7.1.4 The bedrock beneath the site is defined by BGS data to be sandstone, which sits close to the transition with chalk. The soils beneath the site are freely draining.
- 7.1.5 The Wiltshire SFRA predicts that groundwater could be close to the surface during a 1 in 100 year event (design flood conditions). In accordance with the SFRA recommendations, the GeoSmart Groundwater Flood Risk data has been analysed alongside BGS and topographic data to determine a more accurate assessment of the flood risk posed to the site.
- 7.1.6 GeoSmart data predicts the site to be in an area of low risk of groundwater flooding.
- 7.1.7 The change of use nature of the development would have negligible impact on local drainage.
- 7.1.8 As a result of the above, limited mitigation measures such as raising the internal finished floor or slab level, use of resilient design measures and the installation of drainage channels have been recommended but are subject to variables such as ceiling height, level access and landscaping.
- 7.1.9 This Flood Risk Assessment shows that the development will be safe for its lifetime, with negligible impact on flooding elsewhere, and therefore meets the requirements of the NPPF.



📍 33 Colston Avenue | Bristol | BS1 4UA

☎ 0117 2441 970

✉ hello@calibro-consultants.com

🌐 www.calibro-consultants.com

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