



**Hope Farm
Rushen Lane
Littleton Upon Severn
South Gloucestershire Council
BS35 1NR**

51.609144 -2.591075

Flood Risk Assessment

**S24-015/FRA
March 2024**

Prepared by :

**Southwest Environmental Limited
80-83 Long Lane
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On behalf of :

**Paul Britton
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Bradley Stoke
Bristol
BS32 8EG**



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1.0 Introduction

Acting on instructions from Mr Paul Britton a Flood Risk Assessment (FRA) is to be conducted in connection with the Proposed Development at Hope Farm. The proposed site is located within **Flood Zone 3**. A site location plan is included within **Appendix 1**.

This FRA presents a review of the existing available flood-related information and sets out the requirements of The Planning Practice Guidance and those of the Environment Agency (EA) and the Local Planning Authority (LPA) in relation to flood risk and limited drainage.

2.0 Scope

This FRA is prepared for the purposes of providing a generalised indication of the potential flood risk to the site, and to identify whether there are any flooding or surface water management issues relating to the development site that may warrant further consideration.

The report is based on information including Strategic Flood Risk Assessments (SFRA), EA Flood Maps, and consultations with the EA and LPA. A third party data set (EA Corporate Services Data Pack) is also used.

March 2014 saw the introduction of The Planning Practice Guidance. Guidance specific to flood risk assessment first given in "Technical Guidance to the National Planning Policy Framework (TGPPG)", has now been transposed in to the html PPG pages that are published on gov.uk.

3.0 Site Summary

The site comprises a field enclosure, with a wooded area to the north east. The site for the static caravan is relatively level, with ground to the south east of the site rising out of flood zones. The ground over the entire site ranges over 2 m in height, highest towards the south east.

3.1 Site Location

Site Address	Hope Farm Rushen Lane Littleton Upon Severn BS35 1NR
Grid Reference	51.608908, -2.590429

3.2 Proposed Development

The proposed development is for installation of 1 static caravan.



4.0 National and Local Policy

4.1 Planning Practice Guidance

The Planning Practice Guidance (PPG) referred to in this report was issued in March 2014. Flood risk assessment is explained more fully in the Technical Guidance Document.

The stated aim of PPG is to ensure that flood risk is taken into account at all stages in the planning process to avoid inappropriate development in areas at risk of flooding, and to direct development away from areas at highest risk.

4.1.1 Flood Risk Vulnerability

The Flood Risk Vulnerability Classification for the proposed development has been determined in accordance with Table 2 in PPG, it is considered, Less Vulnerable - Land and buildings used for agriculture and forestry.

4.1.2 Flood Risk Vulnerability and Flood Zone 'Compatibility'

Table 2 in TGPPG states that developments deemed as '*Water Compatible*' are appropriate for areas classified as within Flood Zone 3.

4.2 Environment Agency Flood Risk Standing Advice

Environment Agency Flood Risk Standing Advice is designed to help:

- Find out whether an application is lower risk;
- decide when to consult EA;
- determine what the consultation should contain;
- understand how to make a decision on lower-risk sites and
- know what information is required to make an assessment of flood risk.

4.3 SFRA Principals

The SFRA includes details of policy considerations and sets out flood risk management objectives.

i) The management of Surface Water via SUDs;

"The management of rainfall (surface water) is considered an essential element for reducing future flood risk to both the site and its surroundings, The Environment Agency expect attenuation of runoff from development sites to be restricted to green field rates and SUDs provide an opportunity for achieving this."

ii) Improve Flood Awareness and Emergency Planning;

"Flood warnings are issued using a set of four codes, each indicating the level of risk with respect to flooding."

In addition the SFRA includes guidance for the application of SUDS for new developments, and recommends that the future ownership and management is addressed at an early stage.

5.0 Climate Change

Additional considerations incorporated on the migration of policy from PPS25 to PPG includes quantitative considerations for the effects of climate change.

“In preparing a site-specific flood risk assessment, the allowances for the rates of relative sea level rise [should be] shown¹”

The changing climate should be viewed in relation to the project’s design life;

“Category 1 – Temporary structures, not including structures or parts of structures that can be dismantled with a view to being re-used – 10 years

Category 3 – Agricultural and similar buildings – 15 to 30 years

Category 4 – Building structures and other common structures – 50 years

Category 5 – Monumental building structures, bridges and other civil engineering structures – 100 years²”

5.1 Sea Level Change

FCDPAG3 - Flood and Coastal Defence Appraisal Guidance gives guidance on the application of sea level changes to projects. Forecasted rises over the project’s design life are in the order of 382 mm. These projected sea level changes are accounted for in modelled data. This site is not mapped as influenced by tidal flooding.

Table 4: Recommended contingency allowances for net sea level rises

	Net sea level rise (mm per year) relative to 1990			
	1990 to 2025	2025 to 2055	2055 to 2085	2085 to 2115
East of England, east midlands, London, south-east England (south of Flamborough Head)	4.0	8.5	12.0	15.0
South-west England	3.5	8.0	11.5	14.5
North-west England, north-east England (north of Flamborough Head)	2.5	7.0	10.0	13.0

Figure 1 - Climate Change adaption for Sea Levels

¹ TGPPG - 11

² BS EN 1990, Eurocode - Basis of structural design



5.2 Climatic Conditions

Climate change allowance for design of surface water drainage are sourced from the Environment Agency³. These climatic conditions have been taken in to account in Surface Water Management features, such as attenuation tanks and SUDs. Attenuation feature scaling (where applicable) should reflect the upper end allowance (i.e. 40%), unless this can be shown to make the development unfeasible.

6.0 Flood Depths & Flood Zones

6.1 Strategic Flood Risk Assessment (SFRA)

There is an SFRA is made available for viewing on the Somerset Council Website⁴.

6.2 Flood Risk Maps

Maps in **Appendix 2** are based on the Flood Zone classifications given in TGNPPF. The available maps indicate that the proposed development within Flood Zone 3. Flood Zone 3 is defined in TGNPPF – Table 1.

“This zone comprises land assessed as having 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.”

6.3 Flood Level Data

Ground level on site at the area of the static caravan is 8.60 mAOD. This has been derived from LIDAR DTM. The nearest area of land is Flood Zone 1 is at a level of 10.2 mAOD to the south east as described above.

The flood level is likely to be a maximum of 0.5 mAGL in the northwest of the site, modelled from a 1 in 200 event (0.5% AEP). The flood level in the southeast of the site, where the static caravan is located is seen as 0 m, indicated by the flood breach map. The flood breach depth map indicates that the south east of the site will not be in a 1 in 200 flood event area.

6.4 Sources of Flood Risk

It is confirmed that the site is within flood zone 3, this can be seen on various flood risk maps from numerous sources. Flood Risk comes from fluvial, tidal and surface water surfaces; sewer flooding should also be taken into account.

6.5 Location of Existing Flood Defences

The site does benefit from flood defences. The site is marked as being in an area benefiting from flood defences.

³ <https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>

⁴

<https://www.n-somerset.gov.uk/my-services/planning-building-control/planningpolicy/supplementary-planning-advice/guidance/strategic-flood-risk-assessment/>

7.0 Surface Water Management Plan

The proposal sees new impermeable surface introduced to a green field site. Some additional attenuation feature will be required.

Based on a 1:100 year rainfall event we have calculated a 0.11 m³ attenuation volume will be required, provided in the form of a swale, or ditch running out to site boundary. In the event of an exceedance event, we would suggest that overland flow to the north of site is acceptable owing to the rural nature of land in that area.

8.0 The Sequential Test

The site involves the addition of a static caravan to nearby agricultural buildings. The site relies on the existing agricultural system, with the static caravan being in its vicinity. The proposal involves an extension of an existing land use and as such the sequential test is not thought applicable.

9.0 Exceptions Test

The development represents a “*Highly Vulnerable*” development situated in Flood Zone 3, but effectively benefits from flood defences of “1 in 200” and therefore should be in Flood Zone 2 and as such is subject to the exceptions test. See Figure 3. Although the site recedes within Flood Zone 3, the flood breach depth map indicates that the south east of the site where the static caravan is located will not be in a flood area. So the Flood Risk for this site should be Zone 2.

Table 3: Flood risk vulnerability and flood zone ‘compatibility’

Flood risk vulnerability classification (see table 2)	Essential infrastructure	Water compatible	Highly vulnerable	More vulnerable	Less vulnerable
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	✓	Exception Test required	✓	✓
Zone 3a	Exception Test required	✓	x	Exception Test required	✓
Zone 3b functional floodplain	Exception Test required	✓	x	x	x

Key: ✓ Development is appropriate.
x Development should not be permitted.

Figure 2 - Exception Test Required?

9.1 Wider Sustainability Benefits

The proposed development will lead to a reduction in transport related emissions. The workers of Hope Farm would be able to stay on site, instead of having to drive to the site. The development will exceed statutory minima with regards to energy efficiency. The use of Hope Farm will lead to a reduction in food imports and increase in British animal welfare and food quality. The above positive effects will lower per capita carbon emissions, the UK has



obligations under national law to reduce its carbon emissions, carbon emissions being a key driver in the increasing severity of weather events and sea level change.

The development will see an increase in attenuation. This will reduce the risk of surface water flooding to surrounding properties, and reduce loadings of surface water sewers during periods of heavy rain.

9.2 Use of Brownfield Land

The development does occupy a previously developed agricultural site.

9.3 Flood Safety

The development is situated within Flood Zone 3 it is fair to assume that it will be at risk from flooding. The South Gloucestershire SFRA gives the site an extreme hazard rating. The site operators should maintain and update a Flood Warning and Evacuation Plan based on EA guide: "What to do before and after a flood", this should include a migration routes in the event of flood, a convenient route to the south east along Rushen Lane, in the direction of Littleton Evangelical Church (BS35 1NR) this is a journey could be undertaken by car, bicycle or on foot owing to distances involved. In the event of a flood defence water levels will rise rapidly, in this circumstance residents should not attempt to evacuate and stay within the upper floors of the property. Site contractors and residents will need to subscribe to EA flood warning text messaging services on 0845 988 1188.

9.4 Result

The development contributes to a lowering of carbon emissions, decreases surface water flooding risk and has flood risk management benefits.

10.0 Building Design

The static caravan will be placed on an existing concrete pad, further increasing its height above any flood level. Recommend to anchor mobile home to foundations, matter of course to be against being moved in the wind, but in the event of a flood outside of modelled extent will be able to resist any hydrodynamic loading.

11.0 Certification

For the avoidance of doubt, the parties hereby expressly agree that the Consultant takes no liability for and gives not warranty against actual flooding of The Client's property or damages material or personal in relation to the performance of the service.

Guidance given on building flood resistance / resilience is given as example only. Responsibility for building design / services and resulting levels of resistance, resilience or drainage performance rests with the client and or developer.

This planning report is produced for the sole use of the Client, and no responsibility of any kind, whether for negligence or otherwise, can be accepted for any Third Party who may rely upon it.

The conclusions and recommendations given in this planning report are based on our understanding of the future plans for the site.



The scope of this FRA was discussed and agreed with the Client. No responsibility is accepted for conditions not encountered, which are outside of the agreed scope of work.



Appendix 1

Site Location

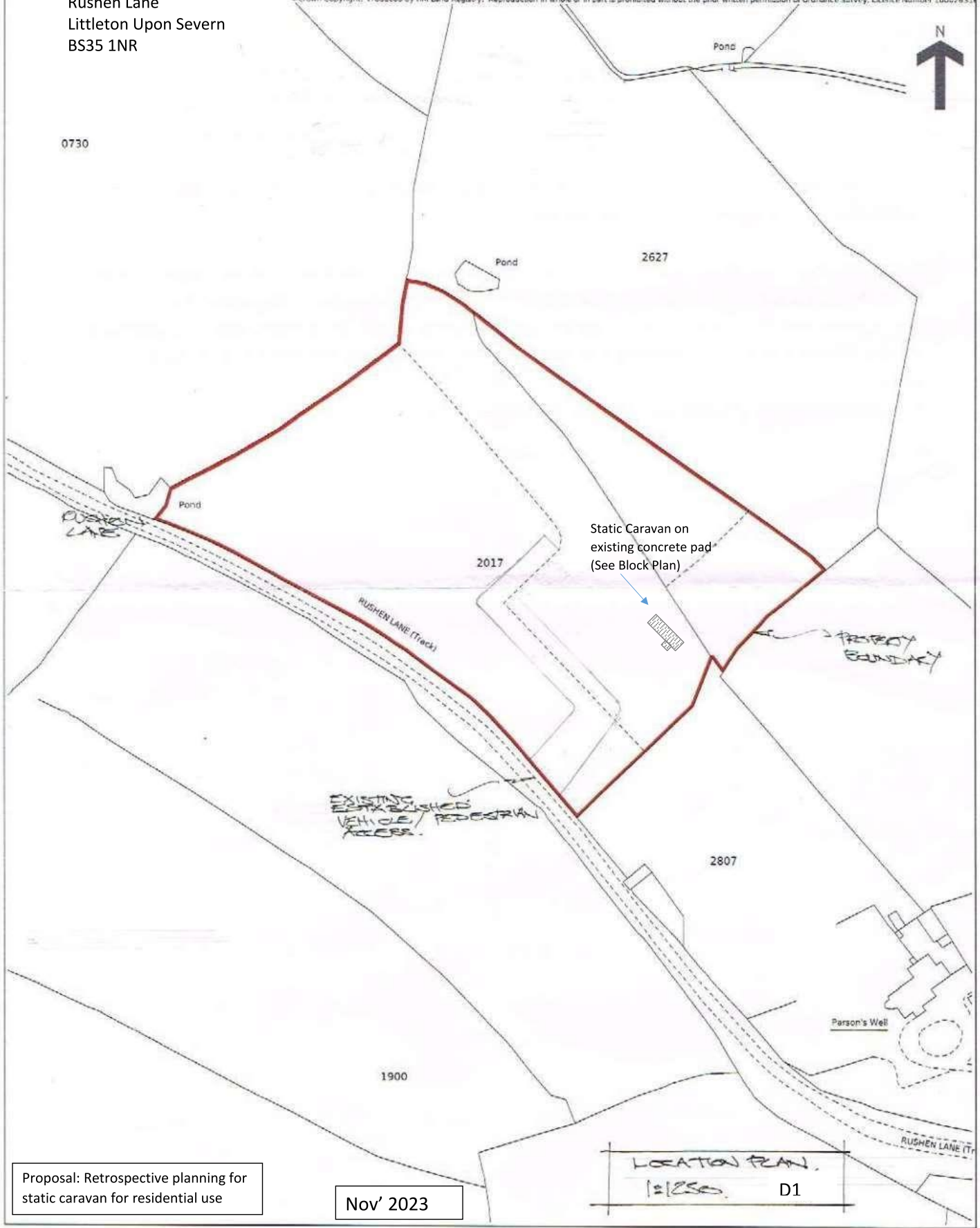
HM Land Registry
Official copy of
title plan

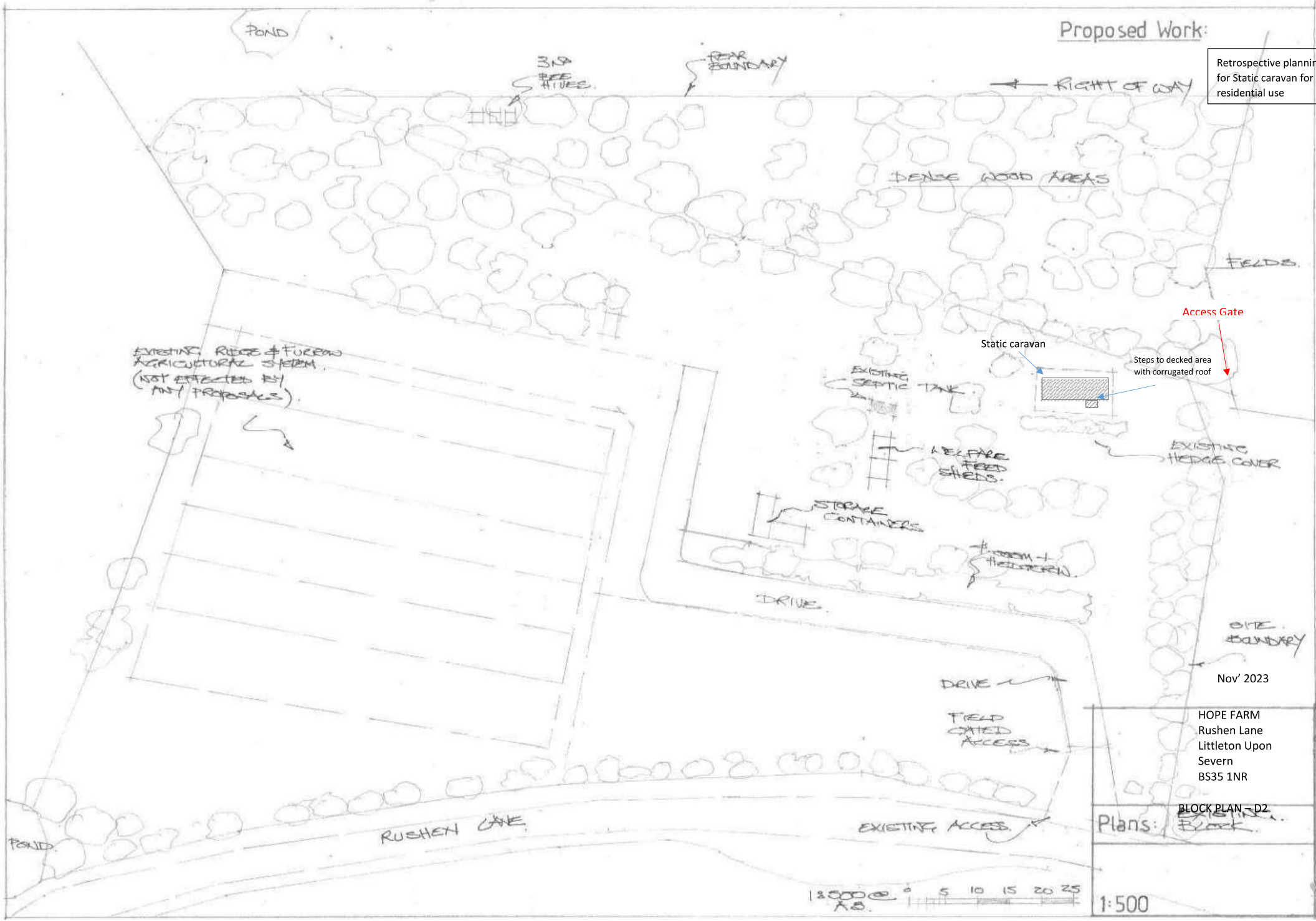
Title number **GR226996**
Ordnance Survey map reference **ST5990SW**
Scale **1:1250 enlarged from 1:2500**
Administrative area **South Gloucestershire**



HOPE FARM
Rushen Lane
Littleton Upon Severn
BS35 1NR

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Proposed Work:

Retrospective planning for Static caravan for residential use

EXISTING RICE & FURROW AGRICULTURAL SYSTEM (NOT AFFECTED BY ANY PROPOSALS)

Access Gate

Steps to decked area with corrugated roof

Static caravan

EXISTING SEPTIC TANK

WELFARE SHEDS

STORAGE CONTAINERS

ROOM + HALLWAY

EXISTING HEDGE COVER

ONE BOUNDARY

Nov' 2023

HOPE FARM
Rushen Lane
Littleton Upon
Severn
BS35 1NR

Plans: BLOCK PLAN - D2
Block



1:500

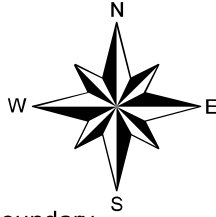


Appendix 2




Flood Data



Scale: 1:10,000 At A3











Legend

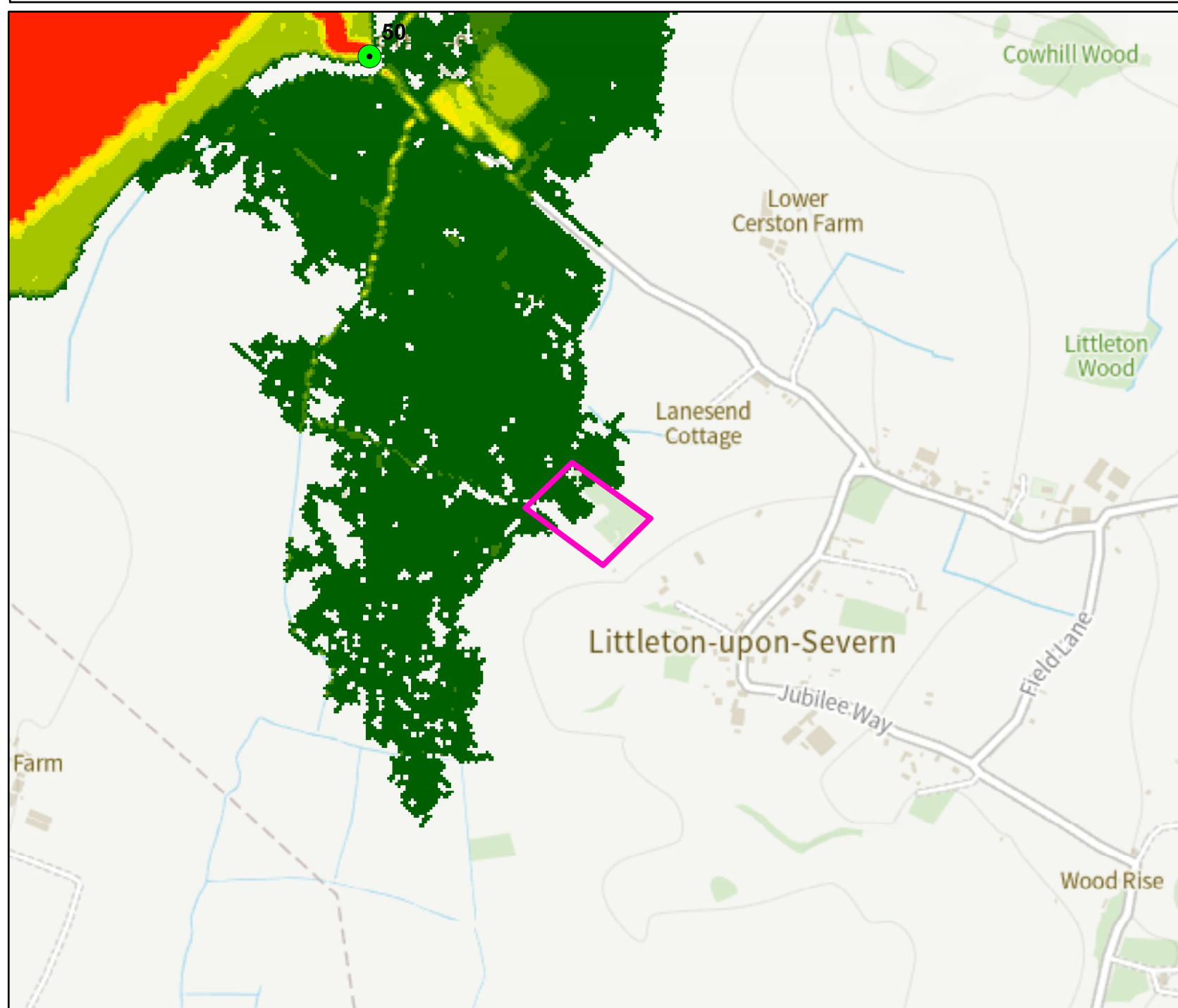
-  343951-WX_site_boundary
-  Asset_failure_locations
-  Statutory_Main_Rivers

Aust_to_Sharpness_50to58_...

Depth (m)

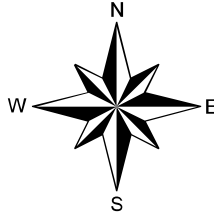
-  0.0000024 - 0.5
-  0.51 - 1
-  1.1 - 1.5
-  1.6 - 2
-  2.1 - 2.5
-  2.6 - 3
-  3.1 - 3.5
-  3.6 - 4
-  4.1 - 4.5
-  > 4.6

We strongly advise that you refer to the caveats in the letter accompanying this map, regarding the usability and appropriateness of the information contained within the map.








Scale: 1:10,000 At A3







Legend

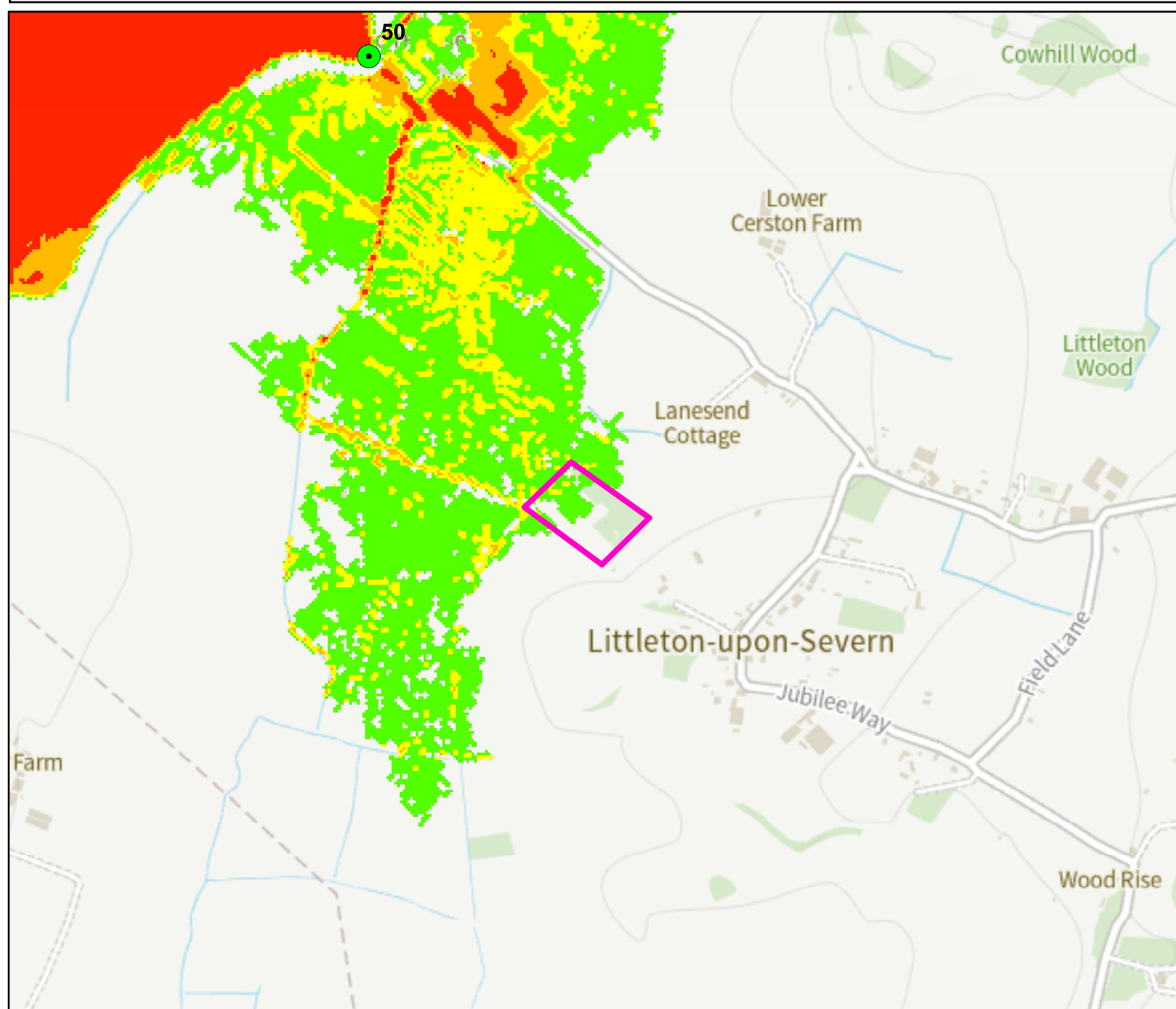
-  343951-WX_site_boundary
-  Asset_failure_locations
-  Statutory_Main_Rivers

Aust_to_Sharpness_50to58_...

Hazard

-  <0.75 (Very low hazard)
-  0.75 - 1.25 (Danger for some)
-  1.25 - 2.0 (Danger for most)
-  >2.0 (Danger for all)




We strongly advise that you refer to the caveats in the letter accompanying this map, regarding the usability and appropriateness of the information contained within the map.

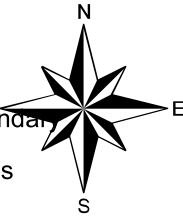




Scale: 1:10,000 At A3













Legend

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-  Asset_failure_locations
-  Statutory_Main_Rivers

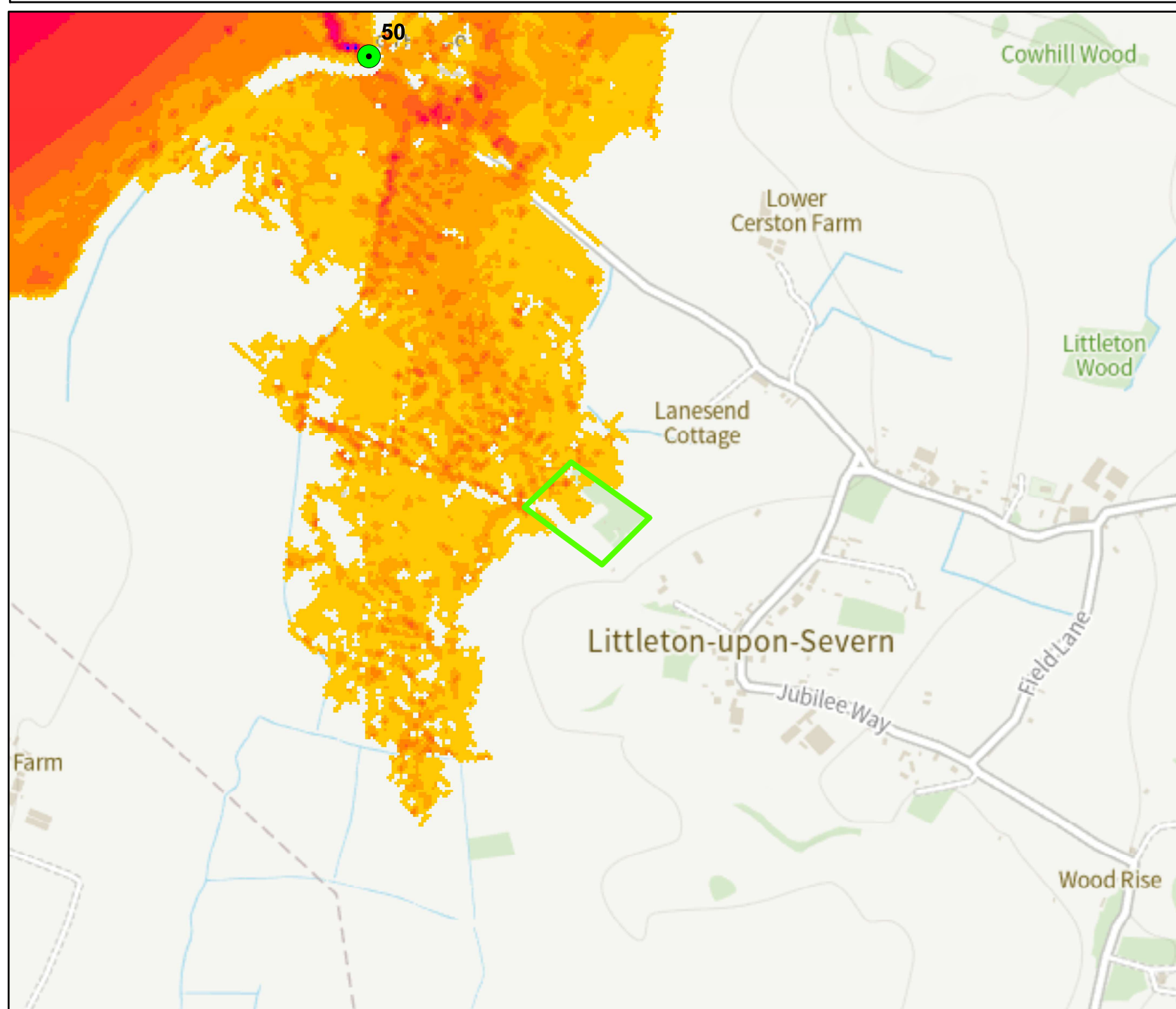


Aust_to_Sharpness_50to58_V...

Velocity (m/s)

-  0 - 0.1
-  0.11 - 0.25
-  0.26 - 0.5
-  0.51 - 1
-  1.1 - 1.5
-  1.6 - 1.9
-  2 - 2.4
-  2.5 - 3
-  3.1 - 3.5
-  3.6 - 4
-  4.1 - 4.5
-  4.6 - 5

We strongly advise that you refer to the caveats in the letter accompanying this map, regarding the usability and appropriateness of the information contained within the map.





Appendix 3

Attenuation Calculation



Southwest Environmental Limited
 80-83 Long Lane
 London
 EC1A 9ET

Flint Street

Revision: **1.00**

Job No: **S24-015** Page: **C/01**

Section: **Hope Farm** Prepared By: **WB** Date: **19/03/2024**

GENERAL DATA

site location: **England and Wales**
 60 min rainfall depth of 5 year return period 'R' [mm] = **20**
 M5-60 to M5-2d rainfall ratio 'r' = **3.50**
 proposed discharge rate 'v1' [litre/s] = **2.00**
 proposed discharge rate 'v2' [litre/s] =
 allowance for climate change: **40%**

SUMMARY OF CALCULATIONS

required storage volume for discharge rate 'v1' = **0.11** m3
 required storage volume for discharge rate 'v2' = m3

AREA DATA

	impermeability [%]	effective area [m2]
impermeable area 'A1' [m2] = 35	100.00	35
landscaping and/or green roof area 'A2' [m2] = 0	20.00	0
other partially permeable area 'A3' [m2] = 0	20.00	0

AREA DRAINED TO ATTENUATION TANK = 35 m2

REQUIRED STORAGE VOLUME PER RAINFALL DURATION FOR DISCHARGE RATE v1

rainfall duration [min]	rainfall factor Z1	M5-D rainfalls [mm]	ignore		ignore		M100-D			outflow from attenuation tank [m3]	required storage [m3]
			Z2	rainfalls [mm]	inflow [m3]	Z2	rainfalls [mm]	inflow [m3]	Z2		
5	0.39	7.80					1.86	20.28	0.71	0.60	0.11

10	0.54	10.80							1.92	29.07	1.02	1.20	0.00
15	0.65	13.00							1.96	35.64	1.25	1.80	0.00
30	0.82	16.40							2.00	45.95	1.61	3.60	0.00
60	1.00	20.00							2.03	56.84	1.99	7.20	0.00
120	1.19	23.80							2.01	67.13	2.35	14.40	0.00
240	1.38	27.60							1.99	76.86	2.69	28.80	0.00
360	1.51	30.20							1.97	83.22	2.91	43.20	0.00
600	1.68	33.60							1.94	91.31	3.20	72.00	0.00
1440	2.03	40.60							1.89	107.15	3.75	172.80	0.00

* Z2 is a growth factor from M5 rainfalls

REQUIRED STORAGE VOLUME PER RAINFALL DURATION FOR DISCHARGE RATE v2													
rainfall duration [min]	rainfall factor Z1	M5-D rainfalls [mm]	ignore			ignore			ignore			outflow from attenuation tank [m3]	required storage [m3]
			Z2	rainfalls [mm]	inflow [m3]	Z2	rainfalls [mm]	inflow [m3]	Z2	rainfalls [mm]	inflow [m3]		
5	0.39	7.80											
10	0.54	10.80											
15	0.65	13.00											
30	0.82	16.40											
60	1.00	20.00											
120	1.19	23.80											
240	1.38	27.60											
360	1.51	30.20											
600	1.68	33.60											
1440	2.03	40.60											

* Z2 is a growth factor from M5 rainfalls