ROY LOBLEY CONSULTING
Specialists in Flood Risk Management

FLOOD RISK ASSESSMENT

STABLE BLOCK
SILKSTONE LANE, SILKSTONE

Mr R Richardson
February 2026

DOCUMENT ISSUE RECORD

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1.0 INTRODUCTION

1.1 The FRA has been produced on behalf of Mr R Richardson in respect of a planning application for a stable block at Silkstone Lane, Silkstone.

Existing Site

1.2 The site is located at grid reference SE2919406444 as shown in **Figure 1.1** below.

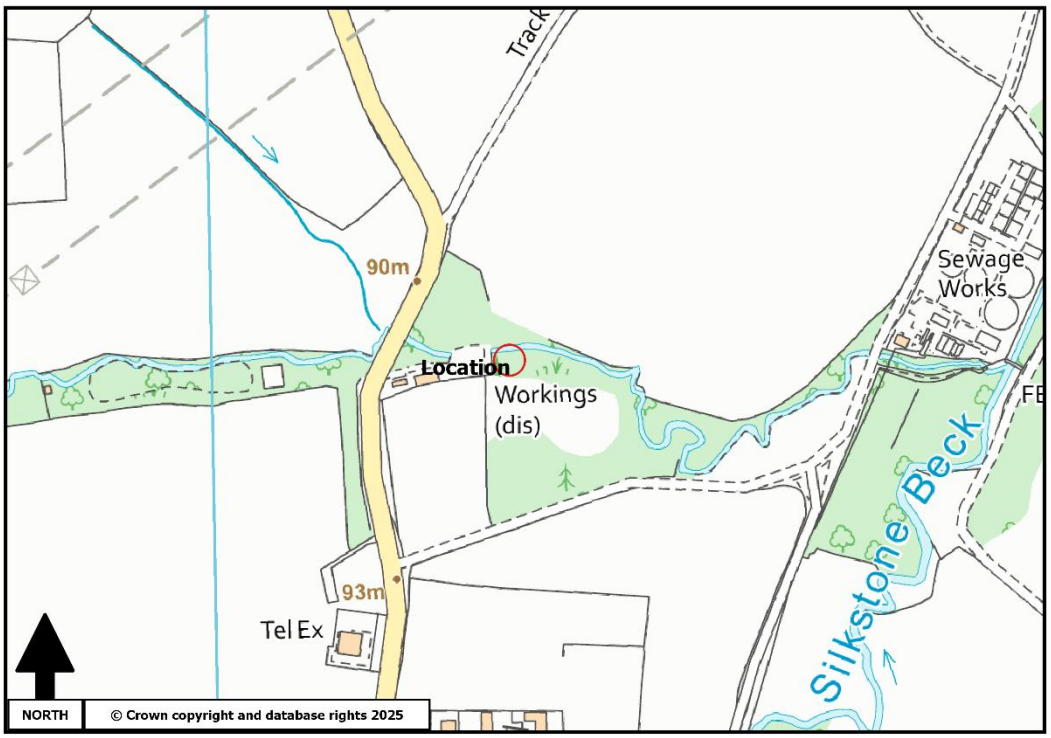

Figure 1.1 Site Location

1.3 LiDAR 2m DTM shows that the existing land level is approximately 87.80m AOD.

Proposed Development

1.4 The proposed development consists of a stable block as shown on the extract of the proposed plan below in **Figure 1.2**

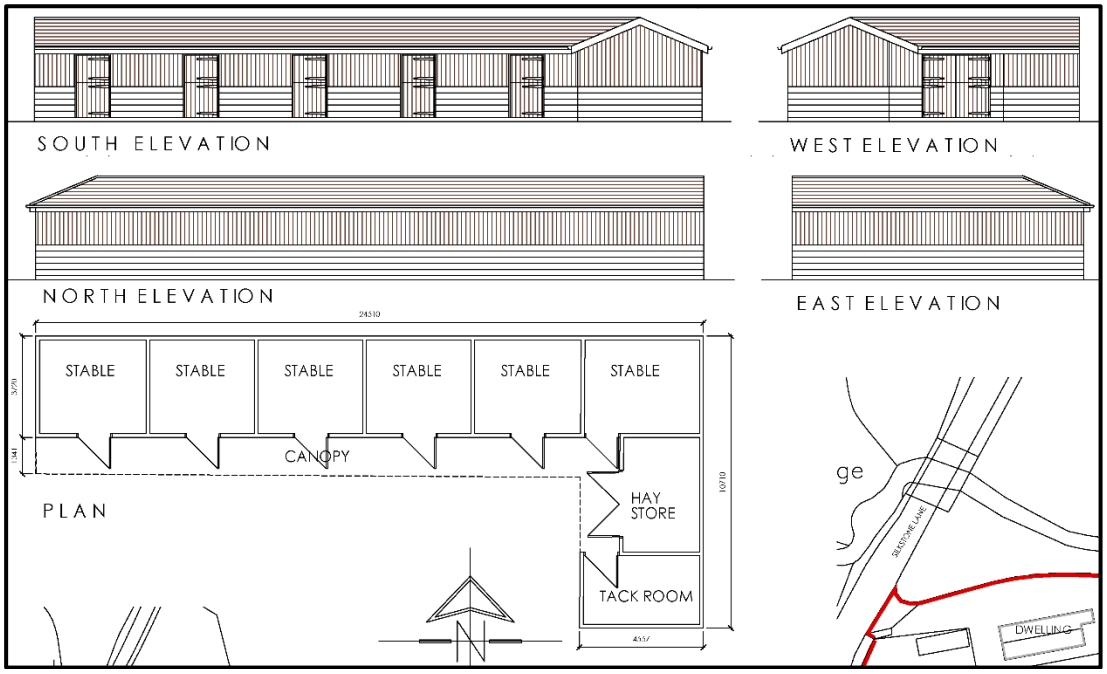

Figure 1.2 Proposed Plan

2.0 FLOOD RISK PLANNING POLICY

National Planning Policy Framework

2.1 The NPPF sets out the Government's national policies on different aspects of land use planning in England in relation to flood risk. A supporting web-based Planning Practice Guidance is also available.

Sequential Test

2.2 The NPPF requires a sequential risk-based approach to be undertaken to individual applications in areas known to be at risk now or in the future from any form of flooding. Within this context the aim of a Sequential Test is to steer new development to areas with the lowest risk of flooding from any source.

2.3 The sequential test should be used in areas known to be at risk now or in the future from any form of flooding, except in situations where a site-specific flood risk assessment demonstrates that no built development within the site boundary, including access or escape routes, land raising or other potentially vulnerable elements, would be located on an area that would be at risk of flooding from any source, now and in the future (having regard to potential changes in flood risk).

Flood Zone Definition

Flood Zone 1	Low probability (1 in 1000 annual probability of river or sea flooding (<0.1%)).
Flood Zone 2	Medium probability (between 1 in 100 and 1 in 1000 annual probability of river flooding (1.0%.-.0.1%) or between 1 in 200 and 1 in 1000 annual probability of sea flooding (0.5%.-.0.1%) in any given year).
Flood Zone 3a	High probability (1 in 100 or great annual probability of river flooding (>1.0%) or 1 in 200 or greater annual probability of sea flooding (>0.5%) in any given year).
Flood Zone 3b	This zone comprises land where water must flow or be stored in times of flood. Land which would flood with an annual probability of 1 in 30 (3.3%), or is designed to flood in an extreme flood (0.1%) should provide a starting point for discussions to identify functional floodplain.

2.4 The aim is to steer new development to Flood Zone 1 and where there are no reasonably available sites in Flood Zone 1, local planning authorities in their decision making should consider the flood risk vulnerability of land uses and consider reasonably available sites in Flood Zone 2, applying the Exception Test if required. Only where there are no reasonably available sites in Flood Zones 1 or 2 should the suitability of sites in Flood Zone 3 be considered.

2.5 The guidance also sets out the vulnerability to flooding of different land uses and this land use is highlighted below.

Flood Risk Vulnerability Classification

Essential Infrastructure

- Essential transport infrastructure (including mass evacuation routes) which has to cross the area at risk.
- Essential utility infrastructure which has to be located in a flood risk area for operational reasons, including infrastructure for electricity supply including generation, storage and distribution systems; including electricity generating power stations, grid and primary substations storage; and water treatment works that need to remain operational in times of flood.
- Wind turbines.
- Solar farms

Highly Vulnerable

- Police and ambulance stations; fire stations and command centres; telecommunications installations required to be operational during flooding.
- Emergency dispersal points.
- Basement dwellings.
- Caravans, mobile homes and park homes intended for permanent residential use.
- Installations requiring hazardous substances consent. (Where there is a demonstrable need to locate such installations for bulk storage of materials with port or other similar facilities, or such installations with energy infrastructure or carbon capture and storage installations, that require coastal or water-side locations, or need to be located in other high flood risk areas, in these instances the facilities should be classified as 'Essential Infrastructure'.)

More Vulnerable

- Hospitals
- Residential institutions such as residential care homes, children's homes, social services homes, prisons and hostels.
- Buildings used for dwelling houses, student halls of residence, drinking establishments, nightclubs and hotels.
- Non–residential uses for health services, nurseries and educational establishments.
- Landfill and sites used for waste management facilities for hazardous waste.
- Sites used for holiday or short-let caravans and camping, subject to a specific warning and evacuation plan.

Less Vulnerable

- Police, ambulance and fire stations which are not required to be operational during flooding.
- Buildings used for shops; financial, professional and other services; restaurants, cafes and hot food takeaways; offices; general industry, storage and distribution; non-residential institutions not included in the 'more vulnerable' class; and assembly and leisure.
- Land and buildings used for agriculture and forestry.
- Waste treatment (except landfill and hazardous waste facilities).
- Minerals working and processing (except for sand and gravel working).
- Water treatment works which do not need to remain operational during times of flood.
- Sewage treatment works, if adequate measures to control pollution and manage sewage during flooding events are in place.
- Car parks.

Water Compatible

- Flood control infrastructure.
- Water transmission infrastructure and pumping stations.
- Sewage transmission infrastructure and pumping stations.
- Sand and gravel working.
- Docks, marinas and wharves.
- Navigation facilities.
- Ministry of Defence installations.
- Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location. Water-based recreation (excluding sleeping accommodation).
- Lifeguard and coastguard stations.
- Amenity open space, nature conservation and biodiversity, **outdoor sports and recreation** and essential facilities such as changing rooms.
- Essential ancillary sleeping or residential accommodation for staff required by uses in this category, subject to a specific warning and evacuation plan

Exception Test

2.6 Having applied the sequential test, if it is not possible for development to be located in areas with a lower risk of flooding (taking into account wider sustainable development objectives), the exception test may have to be applied. The need for the exception test will depend on the potential vulnerability of the site and of the development proposed. The first part of the Exception Test is to show that the proposed development will provide wider sustainability benefits to the community that outweigh flood risk. The second part is the requirement for a FRA to demonstrate that it will be safe for its lifetime, without increasing flood risk elsewhere and where possible reduce flood risk overall. The guidance states when the application of the Exception Test is required and this is summarised below.

Flood Zone 1	Exception Test is not required	All.
Flood Zone 2	Exception Test is not required	Essential Infrastructure; More Vulnerable; Less Vulnerable; Water Compatible;
	Exception Test required	Highly Vulnerable.
Flood Zone 3a	Exception Test is not required	Less vulnerable; Water Compatible.
	Exception Test required	Essential Infrastructure; More Vulnerable.
	Should not be permitted	Highly vulnerable.
Flood Zone 3b	Exception Test is not required	Water Compatible.
	Exception Test required	Essential Infrastructure;
	Should not be permitted	Highly vulnerable; More vulnerable; Less vulnerable.

Development Proposals

2.7 The proposed development consists of outdoor sports and recreation.

Flood Zones

2.8 The Flood Zones are shown on **Figure 2.1** below which shows the site to be in Flood Zone 3.

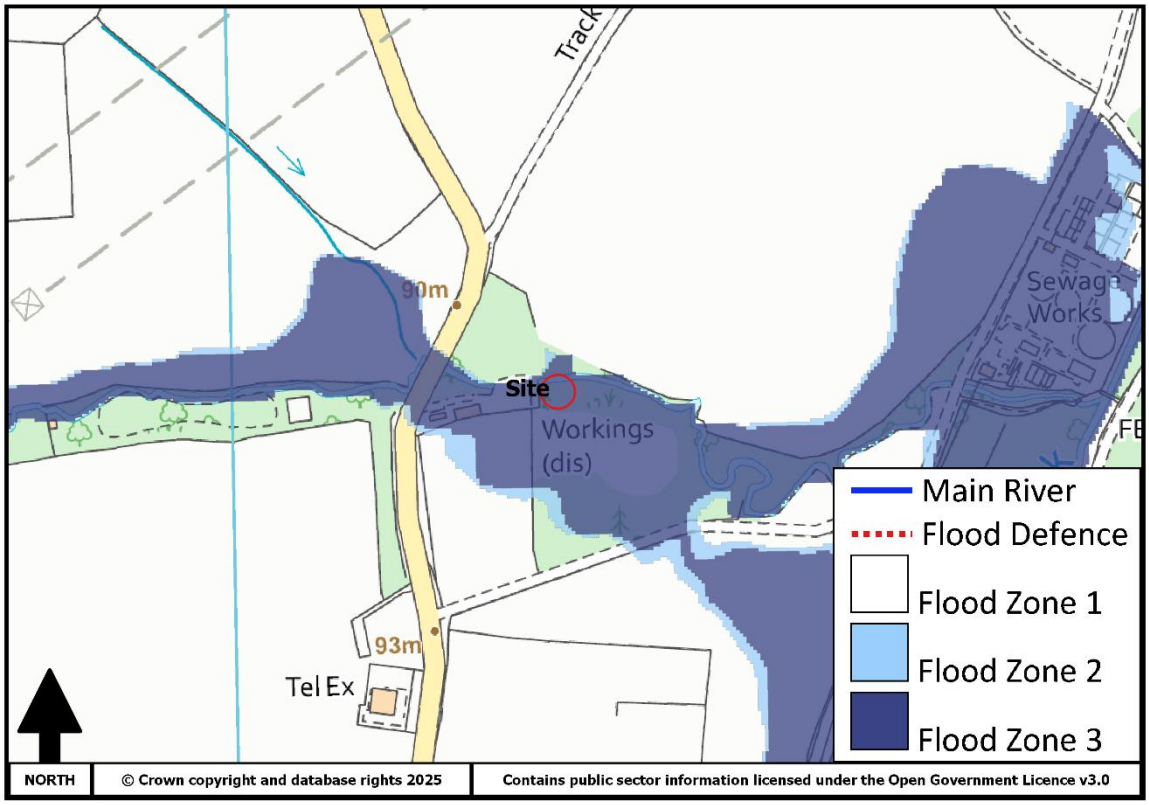

Figure 2.1 Flood Zones

Development Vulnerability

2.9 Outdoor sports and recreation are water compatible

2.10 A FRA is required to ensure the development will remain safe over its lifetime from all sources of flooding and not increase flood risk elsewhere.

3.0 CLIMATE CHANGE

3.1 The NPPF sets out how the planning system should help minimise vulnerability and provide resilience to the impacts of climate change.

3.2 As the Government's expert on flood risk on 19th February 2016 the Environment Agency, (EA), published revised climate change allowances to support the NPPF. The sea level rise allowances were revised on the 17th December 2019, the peak river flows revised on the 20th July 2021 and the peak rainfall allowances were revised on 10th May 2022.

3.3 The climate change allowances are based on projections and different scenarios of carbon dioxide (CO2) emissions to the atmosphere and provide predictions of anticipated change for:

- peak river flow and peak rainfall intensity by river Management Catchment;
- sea level rise;
- offshore wind speed and extreme wave height.

Peak River Flow Allowances

3.4 The peak river flow allowances show the anticipated changes to peak flow by Management Catchment with three allowances; central; higher central and upper end. This proposed development is in the Don and Rother Management Catchment.

3.5 The appropriate allowance depends on the Flood Zone and vulnerability classification of the development and for this proposal it is appropriate to use the Central allowance.

3.6 The allowances change over three periods of time over the next century. The appropriate period should be chosen based on the expected lifetime of the development and for residential that is 100 years.

3.7 The following climate change allowances in peak river flows therefore need to be applied:

DON AND ROTHER	
Allowance Category	**Percentage Increase**
Central	28

Table 3.1 Climate Change Allowances for Peak River Flow

Peak Rainfall Intensity Allowance

3.8 Increased rainfall affects river levels and land and urban drainage and should be applied to surface water drainage systems. However, the proposed development does not increase the impermeable area enough for these allowances to apply.

Sea Level Allowances

3.9 There is a range of allowances for each region and epoch or time frame for sea level rise. However, this site is not affected from tidal sources, see section 4.

4.0 FLOOD RISK SOURCES

4.1 The following flood risk sources have been identified and where mitigation is required to reduce the flood risk this is discussed in **Section 5**.

Fluvial

Main River

4.2 The nearest EA Main River to the site is the Cawthorne Dyke approximately 3.30km to the north east of the site. Cawthorn Dyke then flows for approximately 300m east into the River Dearne, another Main River.

Ordinary Watercourses

4.3 An ordinary watercourses is located on the northern boundary of the site. This watercourse flows west to east for approximately 320m where it joins the Silkstone Beck, another ordinary watercourse.

Silkstone Beck

4.4 Silkstone beck then flows approximately 2.50km north where it joins the ordinary watercourse section of the Cawthorn Dyke.

4.5 Although not a Main River the EA have provided modelling information for the Silkstone Beck. The information provided by the EA from the 2010 Upper Dearne model at node 8, the confluence with the other ordinary watercourse, gives the following modelled, in-channel, flood levels:

Return Period	Level (m AOD)
1.0% (1 in 100)	81.93
1.0% (1 in 100) + 20%	82.07
0.1% (1 in 1000)	82.42

Table 4.1 Silkstone Beck Flood Levels

Climate Change

4.6 The above results have a climate change increase of 20% added to the peak river flows whereas the guidance now indicates that in the Don and Rother Management Catchment 28% should be added.

4.7 Given the scale and nature of the proposed development it is considered that additional hydraulic modelling is not appropriate to determine the revised river levels.

Actual Risk of Flooding

4.8 The EA have provided mapping showing the modelled flood extents for a range of return periods and this map is shown below in **Figure 4.1**.

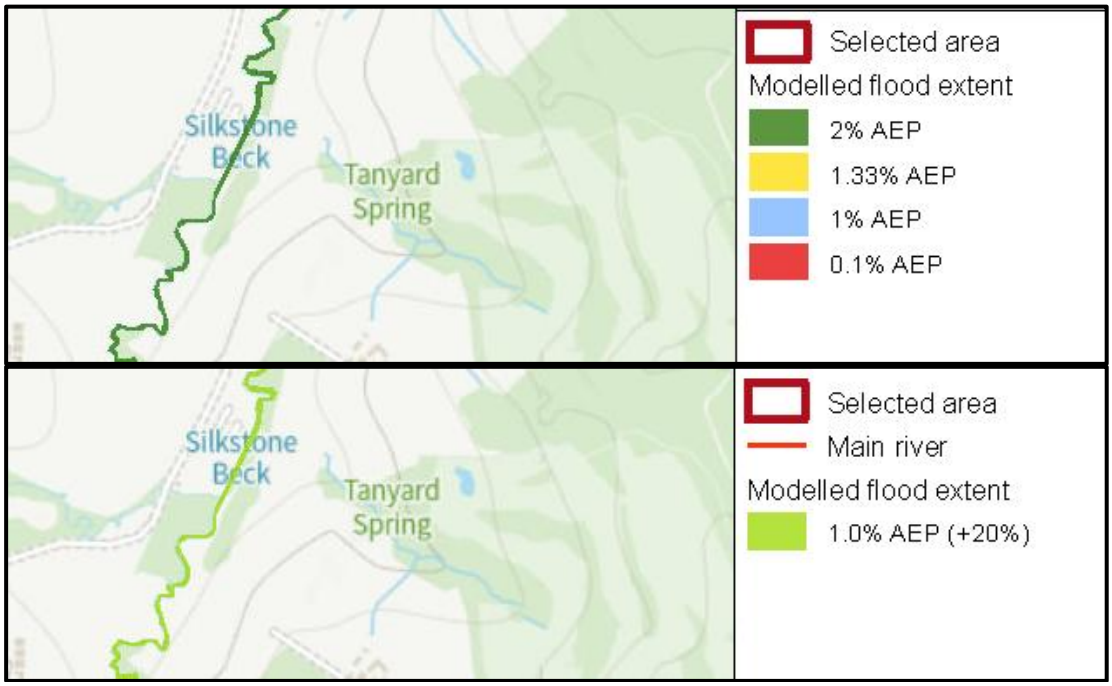

Figure 4.1 Modelled Flood Extents

4.9 The site is shown not to be at risk of flooding from the Silkstone Beck with all flood events remaining withing the channel.

Banks Bottom Dike

4.10 Figure 4.2 below shows a LiDAR 2m DTM cross section through Bank Bottom Dike and into Flood Zone 3.

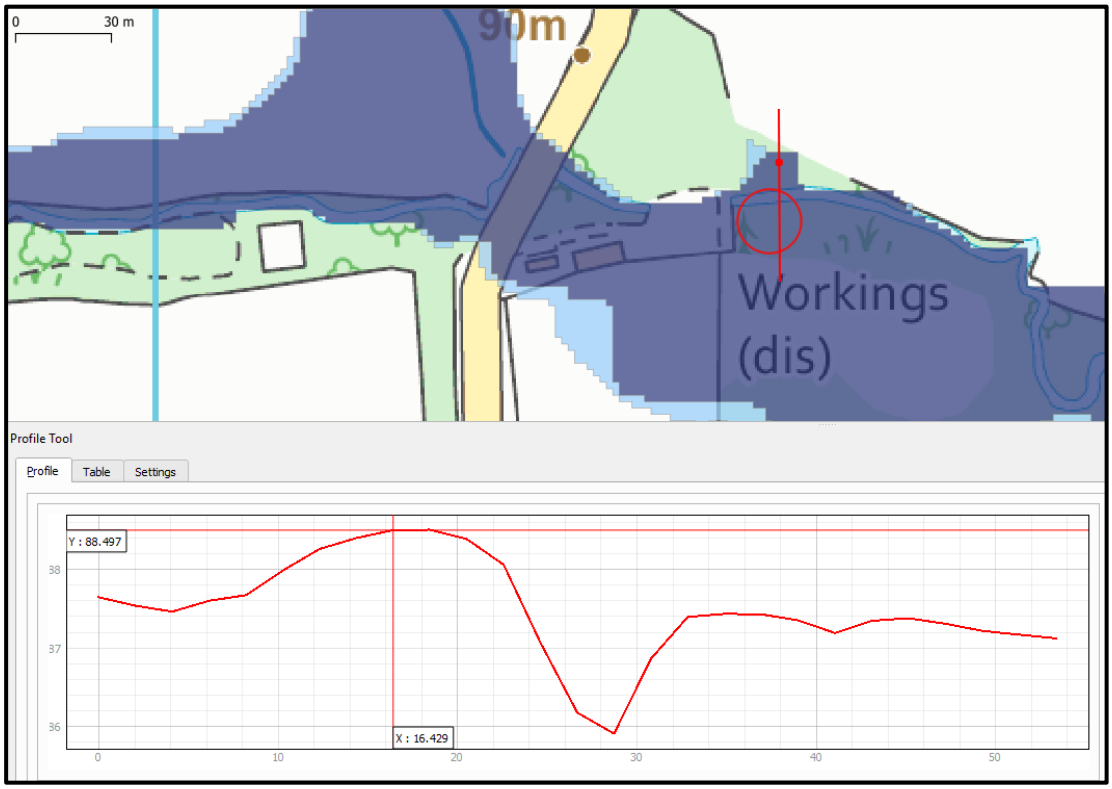

Figure 4.2 LiDAR 2m DTM Cross section

4.11 The land level at the extent of Flood Zone 3 is approximately 88.50m AOD.

4.12 Flood risk from fluvial sources is high.

Tidal

4.13 The site is not at risk from tidal sources.

Pluvial

4.14 The EA have produced maps that show the chance of flooding from surface water to areas of land. Climate change scenarios have been produced to indicate the predicted impacts of climate change on future flood risk between 2040 and 2060.

4.15 The flood Risk is displayed as one of three likelihood categories:

- High Greater than or equal to 1 in 30 (3.3%) chance of flooding in any year.
- Medium Less than 1 in 30 (3.3%) but greater than or equal to 1 in 100 (1%) chance of flooding in any given year.
- Low Less than 1 in 100 (1%) but greater than or equal to 1 in 1000 (0.1%) chance of flooding in any given year.

4.16 The climate change, (2040 – 2060), risk of flooding map is shown below in **Figure 4.3**.

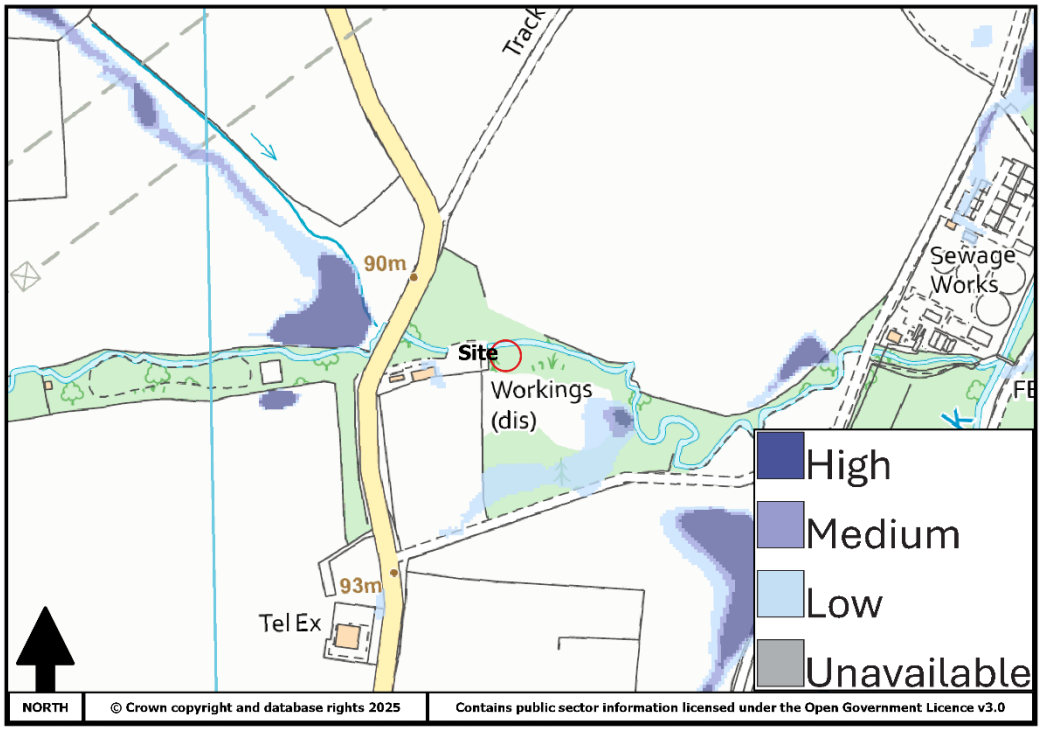

Figure 4.3 Risk of Flooding from Surface Water (2040 – 2060)

4.17 The site is not at risk of flooding from surface water.

Groundwater

4.18 The site is located on a moderately productive aquifer and there are no known instances of groundwater flooding in the area.

4.19 The risk of flooding from groundwater is low.

Sewers

4.20 Public maintained sewers are unlikely to pose a significant flood risk as they are well maintained.

4.21 The risk of flooding from existing sewers is low.

Reservoirs

4.22 The EA has prepared reservoir failure flood risk mapping to show the largest area that might be flooded if a reservoir were to fail and release the water it holds.

4.23 The site is not at risk of flooding from reservoirs.

Canals and Artificial Water Bodies

4.24 The site is not at risk of flooding from canals.

5.0 MITIGATION

5.1 Section 4.0 has identified the sources of flooding which could potentially pose a risk to the site and the proposed development. This section of the FRA sets out the mitigation measures which are to be incorporated within the proposed development to address and reduce the risk of flooding to within acceptable levels.

Site Layout

5.2 The proposed development is at a high risk of flooding from fluvial sources.

5.3 The land level at the extent of Flood Zone 3 is approximately 88.50m AOD.

5.4 The existing land level is approximately 87.80m AOD.

5.5 Given the nature of the proposed development, i.e. a stable block, it is only possible to raise the floor level to 87.95m AOD.

5.6 Any equipment stored in the stable block will be stored a minimum of 0.60m above the floor level and be above 88.55m AOD.

5.7 Any electrical installation will be above 88.55m AOD.

Safe Access and Egress

5.8 It is recommended that the future users sign up to the EA flood warning service. The area is only covered by an EA Flood Alert and not a Flood Warning. Following receipt of the Flood Alert the users of the stable block will need to monitor the rising flood level in the adjacent watercourse and decide if the horses need to be relocated to a safer area outside of the floodplain. The applicant does own additional land outside of the floodplain as shown below in **Figure 5.1** and it is a simple exercise to move any horses to that area. Safe access and egress for users of the stable block will be via this area of land to the adjacent road.

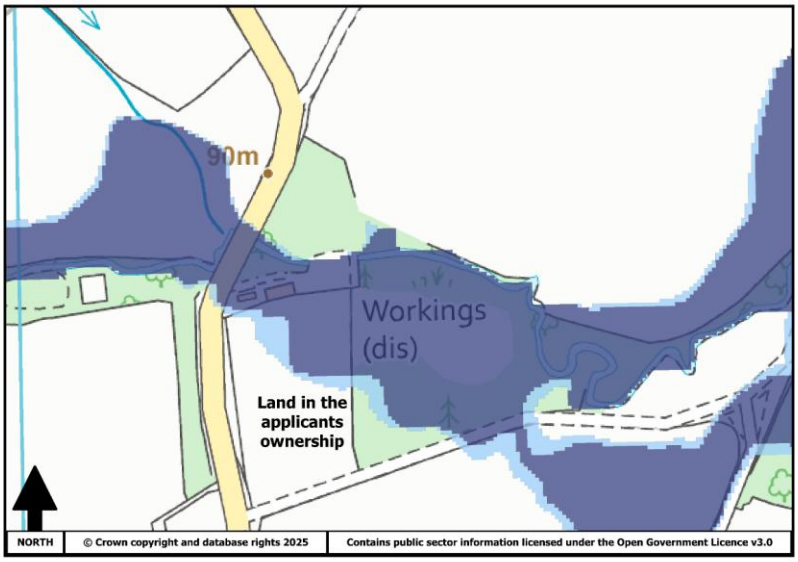

Figure 5.1 Land in Applicants Ownership

Floodplain Compensation

5.9 The NPPF Planning Practice Guidance states that a FRA should assess the impact of the loss of floodplain storage and demonstrate how mitigation measures have addressed them, which could include level for level compensatory storage.

5.10 The Guidance also states that where it is not possible to fully mitigate the impacts the FRA will need to justify why and detail the extent and nature of the increase in risk and assess its significance.

5.11 The FRA also needs to be appropriate to the scale and nature of the development.

Loss of Floodplain Storage

Water Entry Strategy

5.12 The proposed development is for a stable block and therefore in order to reduce the impact of land raising on the floodplain it is proposed that a water entry strategy will be used in accordance with the document "Improving the Flood Performance of New Buildings "as follows;

- **Floors**
  Concrete ground-supported floors with a concrete slabs of at least 100mm thickness will be constructed.
- **Walls**
  Walls will be constructed from concrete blocks as these dry more quickly and are recommended for a water entry strategy.
  External renders **will not** be used.
- **Doors**
  As the proposed development is for a stable block traditional stable doors will be used and will be sacrificial. The doors will not be sealed and will allow flood water to enter the building.
- **Services**
  The only services to the proposed building are electrics which will be sited above the potential flood level at 88.55m AOD.
- General Equipment
  All general equipment will be stored above the potential flood level at 88.55m AOD.

5.13 The only land to be raised is that to achieve the required floor level of the stables. The footprint is 117m^2 and the floor will be raised 0.15m above ground level which gives a volume of 18m^3.

5.14 It has been assumed that any effects would be localised and a floodplain area of 12,000m^2, as shown below in **Figure 5.2**, has been used.

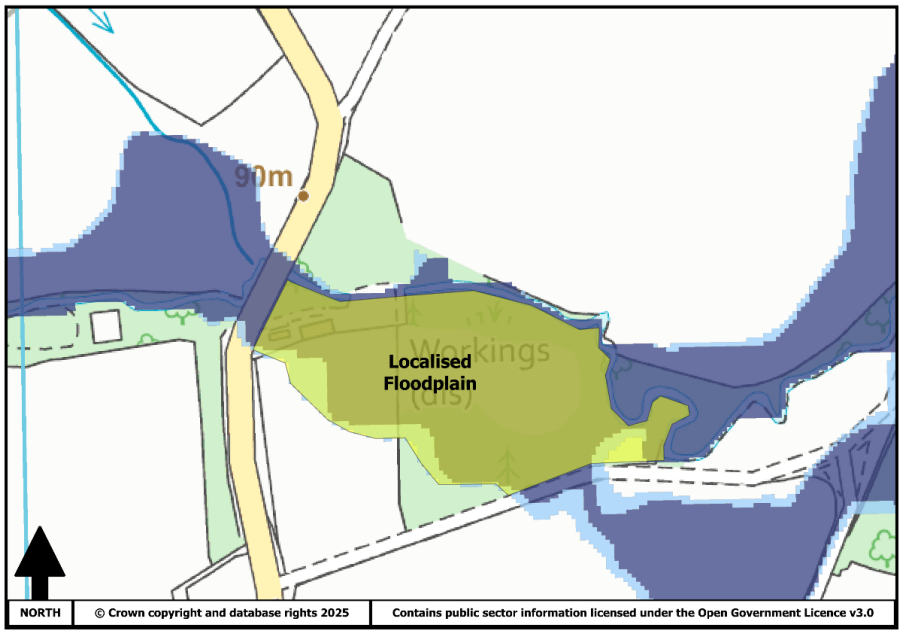

Figure 5.2 Local Floodplain Area

Increase in Flood Depths

5.15 With a loss of storage of 18m^3 over the local floodplain area of 12,000m^2 would result in an increase in flood level of 1.5mm. The localised floodplain area is within the ownership of the applicant.

6.0 CONCLUSIONS

6.1 This FRA is compliant with the requirements set out in the NPPF and the associated online Planning Practice Guidance.

6.2 The FRA has been produced on behalf of Mr R Richardson.

6.3 This report demonstrates that the proposed development is not at significant flood risk, and will not increase flood risk to others, subject to the recommended flood mitigation strategies being implemented.

6.4 The identified risks and mitigation measures are summarised below;

Flood Risk Source	Level of Risk Without Mitigation	Proposed Mitigation
Fluvial	High	Floor level 87.95m AOD Equipment stored above 88.55m AOD. Electrical installation above 88.55m AOD
Groundwater Sewers	Low	
Tidal Pluvial Reservoir Canal/Artificial	None	

Table 6.1 Summary of Risk and Mitigation

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