



Bonchester Bridge
Flood Risk Assessment

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Revision History

Version	Title	Date
V3	Final	100818

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1. Introduction

1.1 Background

1.1.1 This Flood Risk Assessment has been prepared by Allen Creedy MRTPI FIEMA to assess the flood risk associated with the proposed development on land to the northwest of Town O' Rule Farmhouse, near Bonchester Bridge in the Scottish Borders.

1.1.2 The study is necessary to meet the requirements of Scottish Planning Policy, June 2014 (SPP) and SEPA Policy 41.

1.1.3 The study comprised the following;

- Site walkover
- Consideration of sources of flood risk
- Consideration of flood mitigation options
- Preparation of a report to meet the requirements of Scottish Planning Policy (SPP) and SEPA protocol

1.2 Reporting Guidelines

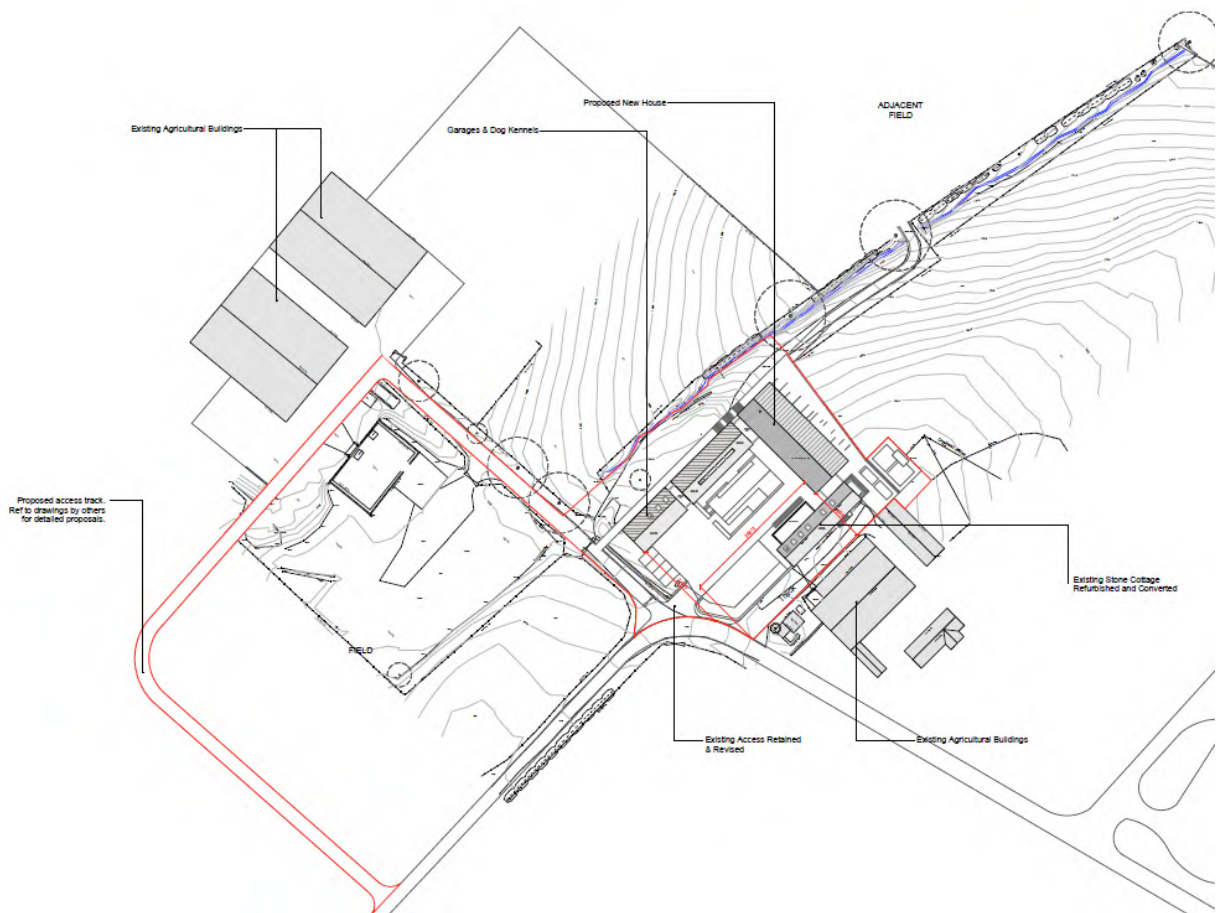
1.2.1 This Flood Risk Assessment is consistent with the reporting requirements detailed within SEPA's 'Technical Flood Risk Guidance for Stakeholders', which supersedes Annex B of SEPA Policy 41. The aim of this document is to ensure that relevant information is presented in a clear format that can be reviewed by the Planning Authority and SEPA and is consistent with SPP.

2. Site Details and Location

2.1 Overview

- 2.1.1 The proposed development site is located 2.1km north of Bonchester Bridge, Ordnance Survey National Grid Reference (OS NGR) NT 58810 13374 and consists of agricultural land with a small watercourse to the west of the site. There are a number of existing agricultural buildings on the site. The site has an area of approximately 0.58 hectares.
- 2.1.2 A small stream is located approximately 35m west of the site but the flood outline for the stream shown on the SEPA online flood maps confirms that this watercourse will not impact on the proposed development site.

Figure 2.1 Extract from Proposed Site Plan



2.2 Sources of Flood Risk

- 2.2.1 Scottish Planning Policy, June 2014 (SPP) highlights that there are a number of potential sources of flooding that could impact any site, these are fluvial (origination from a watercourse), coastal, groundwater, surface water (pluvial), sewers and blocked culverts. The purpose of this report is to provide an assessment of flood risk to the site from those sources.

2.3 Coastal Flooding

2.3.1 The site is located approximately 88km inland from the coast. There is therefore no risk of coastal flooding.

2.4 Fluvial Flooding

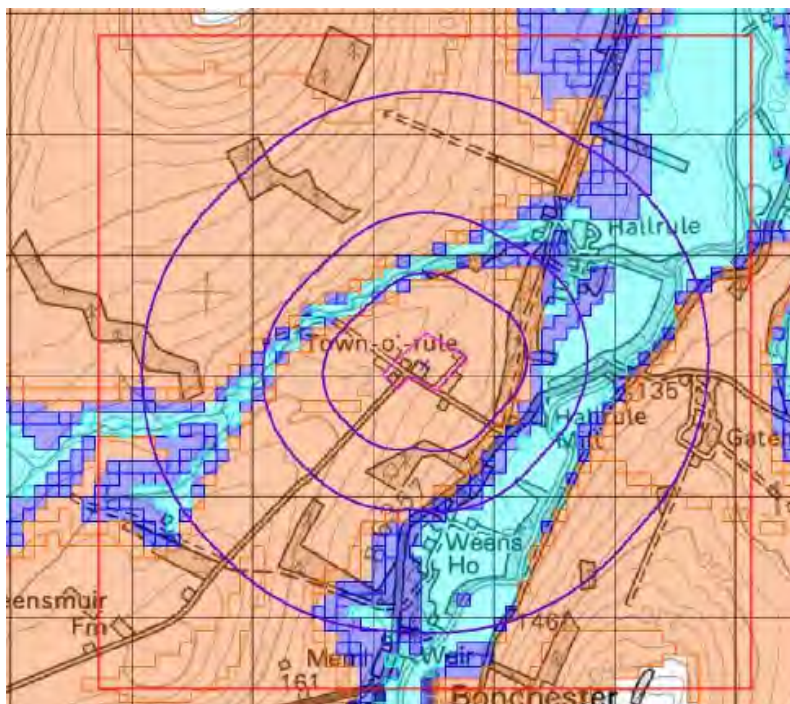
2.4.1 Fluvial flooding is flooding originating from a watercourse. The nearest watercourse is a small stream, approximately 35m to the west of the site. The SEPA Flood Map (2015) indicates that the site is not at risk from fluvial flooding.

2.5 Groundwater Flooding

2.5.1 Groundwater flooding is flooding that is caused by unusually high groundwater levels or flow rates. During flooding, groundwater can emerge at the ground surface or within man-made underground structures such as basements. There are various mechanisms of groundwater flooding, including clearwater flooding due to prolonged heavy rainfall on distant connected geology alluvial and coastal groundwater flooding, and that associated with minewater rebound or ground subsidence. The site is located outside the area of groundwater influenced flooding shown on the SEPA map.

2.5.2 Envirocheck records confirm that the site is in an area where there is limited potential for groundwater flooding to occur.

Figure 2.2 Extract from Envirocheck Groundwater Flooding Map



2.6 Surface Water (Pluvial) Flooding

2.6.1 Surface water (pluvial) flooding occurs from intense rainfall related overland flows and ponding in localised depressions. The SEPA Flood Map (2015) indicates that the site is not at risk from surface water flooding.

2.6.2 Envirocheck records confirm that the site is not at risk from surface water (pluvial) flooding.

Figure 2.3 Extract from Envirocheck Surface Water Flooding Map

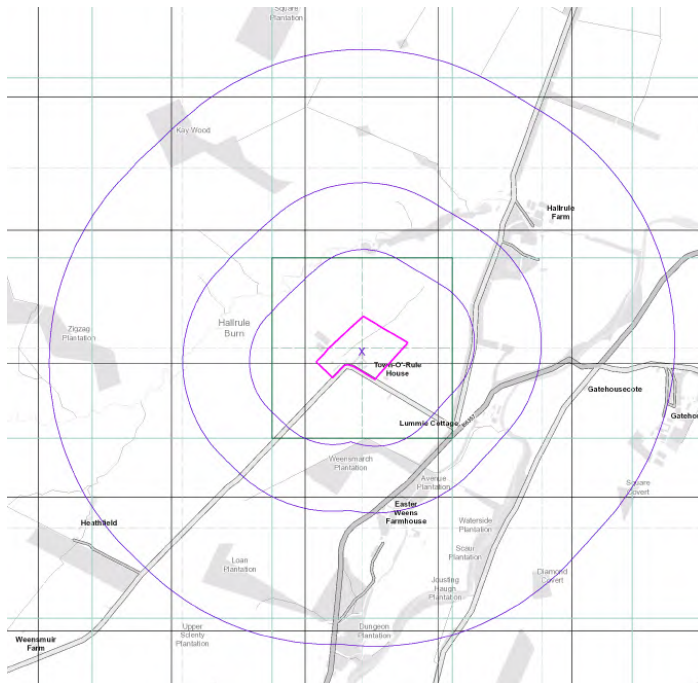
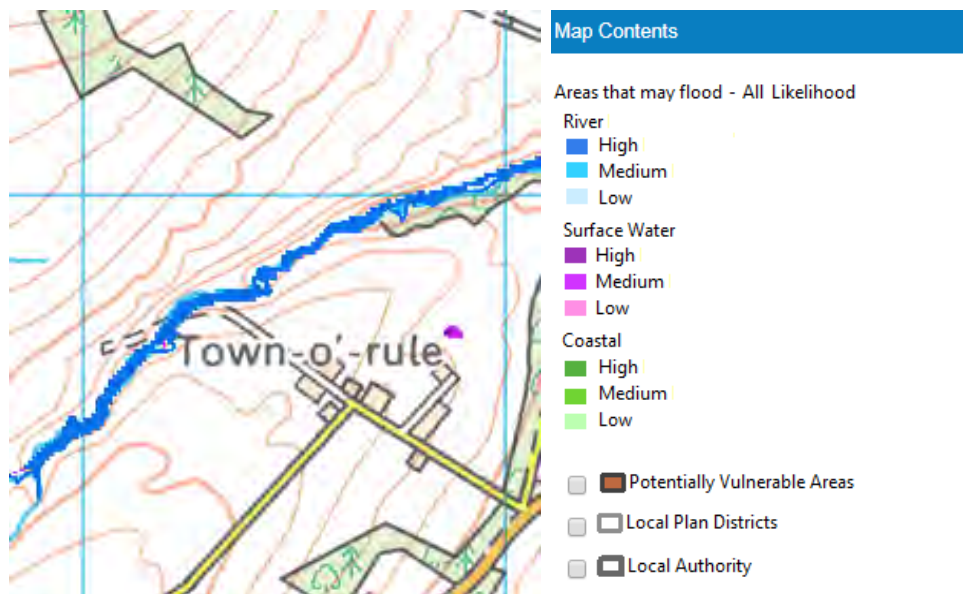


Figure 2.4 Extract from SEPA Flood Map (2015)



3. Site Walkover

3.1 Introduction

3.1.1 In order to gain a better understanding of potential flood risk to the site, a site visit was conducted on Friday 16th of March 2018. The weather conditions were cold, damp and windy with good visibility.

3.2 Site Topography

3.2.1 The site covers a section of land which includes a terrace at a higher level (which covers the site of an existing open-sided, L-shaped timber structure and stone outbuilding) that slopes steeply down to the northwest, towards the small stream which runs parallel to the site and flows in a northerly direction. The site levels fall from 186.83mAOD at the site access, down to 181.48mAOD beyond the terrace upon which the proposed dwelling would be constructed. The rest of the site is relatively even with small hummocks and undulations.

Figure 3.1 Topography of existing site as observed from access road on 16.03.2018



3.3 Watercourses

3.3.1 The nearest watercourse, a small stream, is located approximately 35 metres to the west of the site of the proposed dwelling. The stream flows in a northerly direction and the topography of the site (where the development site sits at a higher level than the stream) means that there is no risk of the stream overflowing and presenting a flood risk to the proposed dwelling.

3.3.2 The site walkover on Friday 16th of March was undertaken during rainy, wet and cold conditions where it would be expected that any drainage and/ or flood risk issues would become more obvious. However, no risk of flooding or drainage issues were observed.

Figure 3.2 Nearest watercourse as observed on 16.03.2018



3.4 Land Use

- 3.4.1 The site and surroundings consist of land which is used largely for agricultural purposes. The site is located to the east of a small stream and land use consists of existing buildings and hardstanding with a greenfield area. There are residential dwellings to the east of the site. There are agricultural buildings, including two large sheds located to the west of the site.

Figure 3.3 Agricultural buildings to the west of the site as observed on 16.03.2018



3.5 Historical Flooding

3.5.1 No evidence of past flooding events on or adjacent to the site has been identified.

3.6 Site Access

3.6.1 Access to the site is gained from the D63. There is an existing agricultural track adjacent to the site which provides access to the agricultural buildings to the west. The track is not at risk from fluvial flooding due to the difference in elevation between the access and the watercourse. No evidence of surface water (pluvial) flooding was observed during the site walkover, which was undertaken in rainy conditions.

Figure 3.4 Site access as observed on 16.03.2018



3.7 Historical Flooding

3.7.1 Readily available archives including the internet based British Hydrological Society Chronology of British Hydrological Events was searched but no specific information for this area was available.

4. Surface Water Management

4.1 Introduction

- 4.1.1 SuDS design has not been finalised at this stage. However, it is recommended that any SuDS be situated outside the functional floodplain, including areas of indicative surface water flooding, and that existing overland flow pathways be maintained or enhanced. High level recommendations for SuDS options are provided below.

4.2 SuDS Recommendations

- 4.2.1 The Water Environment (Controlled Activities) (Scotland) Regulations 2005 (CAR) requires all new developments to employ Sustainable Drainage Systems (SuDS) to control and treat surface water runoff. The following recommendations are made with respect to SuDS options for this site and should be considered further at detailed design stage:

4.3 CAR Binding Rules

- 4.3.1 SuDS should comply with the relevant binding rules described within the Water Environment (Controlled Activities) (Scotland) Regulations 2005 – GBR10: Discharge of surface water run-off from a surface water drainage system to the water environment from construction sites, buildings, roads, yards and any other built up areas and GBR11: Discharge into a surface water drainage system. Any design should be undertaken with reference to the C697 CIRIA SuDS Manual.

4.4 Water Quality

- 4.4.1 SEPA WAT-RM-08 defines the number of treatment levels required. Based on the information currently available for this development, it is anticipated that one level of treatment would be required based on the proximity of the development to areas with designated SAC and SSSI status. This may change depending upon the size of the final development.

4.5 SuDS Options

- 4.5.1 Any designed SuDS should have a neutral or better effect on surface water flooding at the site. The following high level options are suggested, but further investigation of appropriate methods should be undertaken in the detailed design stages:
- a. Infiltration basin or soakaway – this would discharge surface water directly to the ground via infiltration. It is recommended that an analysis of soil and ground conditions are undertaken if this option is to be considered.
 - b. Dry or wet swale – these strips of vegetated land allow collection of surface water from impermeable surfaces and intercept silt and pollution, allowing cleaner water to be discharged to the ground or a waterbody. This option would require consultation with SEPA and a CAR licence following consultation.
 - c. Detention basin – these are used to store and treat water and consist of commonly grassed areas to store runoff from higher storm durations prior to discharge. Flow control is required. As above, consideration of the levels of treatment appropriate for discharge to the ground or waterbody should be undertaken.

4.6 Changes to Flood Risk outwith the Site

- 4.6.1 Given the scale of the development and that the site is at low risk of flooding, there should be no change to flood risk outwith the site over the existing pre-development condition.

5. Conclusions

5.1 Introduction

- 5.1.1 The FRA has been prepared in accordance with Scottish Planning Policy, June 2014 (SPP) for the proposed development on land to the northwest of Town O' Rule Farmhouse. It is understood that the site will be used for the development of a dwellinghouse.

5.2 Summary

- 5.2.1 The site lies outside the indicative limits of groundwater influenced flooding shown upon the SEPA Flood Map (2015). The site is not identified as being at high risk from fluvial flooding or other sources of flooding.
- 5.2.2 Post-development water levels are estimated to be unchanged on land surrounding the site.
- 5.2.3 In summary, the site is at low risk of flooding from all sources.
- 5.2.4 The proposed development in terms of surface water is deemed to be sustainable and all Sustainable Drainage Systems (SuDS) options will be implemented wherever possible.
- 5.2.5 Drainage details are yet to be finalised and it is requested that drainage details be the subject of a condition attached to a planning permission.

Document ends