

Flood Risk Assessment for Proposed Residential Development at Land Adjacent 1A Turnlee Road, Glossop.

Introduction

The purpose of this Flood Risk Assessment (FRA) is to:

- Establish the present flood risks and how they could change;
- Consider whether the proposed residential development will increase flood risk;
- Show plans for the management of any flood risk.

This FRA has been made in accordance with the requirements of the National planning policy Framework (NPPF). It is structured as follows:

- Development site
- Catchment Hydrology
- Potential sources of flooding
- Conclusions
- Appendix of photographic survey

Development site

The proposed development site is located adjacent 1A Turnlee Road, Glossop. The proposed application is for one pair of detached dwelling and garages. The development itself will be less than 1 hectare (2.5 acres) in area.

The exact location for the development is indicated by these grid references:

SK 02953 93480

SK029934

X (Easting):	Y(Northing):
402953	393480

Latitude:	Longitude:
53.438093	-1.9570182

The development site is currently residential gardens belonging to 1A Turnlee Road. Please see photographs 1 to 5 in the appendix at end of this assessment. Based on information from the Flood Map for Planning Service on the UK.Gov website

<https://flood-map-for-planning.service.gov.uk/summary/402945/393501>

and looking over the lifetime of the proposed development, the site lies within Flood Zones 1 and 2 and therefore a Flood Risk Assessment is required.



The large yellow location pointer shows properties 1 and 1A Turnlee Road. The proposed development area will span Flood Risk regions 1 and 2 only as indicated in the development plans supplied by Mike Hambleton. (The white area to the right of the proposed development is categorised as Flood Risk 1. Light blue shading is categorised as Flood Risk 2 and dark blue as Flood Risk 3.)

The development proposal for the above site is to build one pair of semi-detached dwelling and garages. The proposed development is therefore classified as “less vulnerable” based on Table 2 of the Planning Practice Guidance:

<https://www.gov.uk/guidance/flood-risk-and-coastal-change#Table-2-Flood-Risk-Vulnerability-Classification>

The lifetime of the proposed development is assumed to be 100 years.

Catchment Hydrology

The main river catchments within the area are Long Clough Brook and Glossop Brook. Both watercourses are maintained by the Environment Agency. Long Clough Brook is a Main River which flows in a north-west direction within close proximity to the north-east boundary of the development site. The development site is approximately three meters above the base of the watercourse on a steeply rising bank. Please see photographs 6, 7 & 8 in the appendix at end of this assessment. Glossop Brook is a Main River which flows in a westerly direction and is approximately

300m north of the development site. The extent of flooding associated with Glossop Brook does not appear to extend to the development site. Ebflood defences have been investigated and are not present along this section of Long Clough Brook and Glossop Brook.

It should also be noted that the land on the opposite northern bank of Long Clough Brook is significantly lower (please see photographs 6, 8 & 10) and if the brook level were to rise the water would disperse over this lower level. For additional information please see photographs in the appendix at end of this assessment.

Potential Sources of Flooding

A summary of the potential sources of flooding and a review of the potential risk posed by each source at the development site is shown in the following table:

Flooding Source	Potential Flood Risk at Site	Potential Source	Data Sources
Fluvial	Yes	Long Clough Brook	Environment Agency
Tidal	No	None Identified	Environment Agency
Rising/high groundwater	Yes	Aquifer	BGS Map
Overland flow	No	Poor permeability	RMS Map
Artificial drainage systems	Yes	Sewers	United Utilities
Infrastructure failure	Yes	None	OS Map

Fluvial Flooding Sources

As stated above the main river catchments and those contributing to flood risk in Glossop are the catchments of Long Clough Brook and Glossop Brook. Based on flood mapping the site is located within Flood Zones 1 and 2 and is outside the fluvial extents mapped along the north-eastern boundary of the site. However, an objection has been raised by Planning Officer Joseph Drewry that the previously submitted FRA fails to demonstrate that the proposed dwellings will be safe from fluvial flooding over their expected lifetime, without increasing the risk of flooding elsewhere. Modelled fluvial flood level data for Long Clough Brook has been obtained from the Environment Agency and is presented here for this purpose together with the attached topographical survey carried out by SV Surveying Ltd - <http://www.svsurveying.co.uk/>

The National Planning Practice Guidance (CCA Guidance Version 5) refers planners, developers and advisors to the Environment Agency guidance on considering climate change in Flood Risk Assessments (FRAs). This guidance was updated in February 2016 and has been referred to in order to ensure full compliance with the guidance.

The guidance provides a range of allowances to assess fluvial flooding, rather than a single national allowance. It advises on what allowances to use for assessment based on vulnerability classification, flood zone and development lifetime.

Assessment of climate change impacts on fluvial flooding

Table A below indicates the level of technical assessment of climate change impacts on fluvial flooding appropriate for new developments depending on their scale and location.

- **Basic:** Developer can add an allowance to the 'design flood' (i.e. 1% annual probability) peak levels to account for potential climate change impacts. The allowance should be derived and agreed locally by Environment Agency teams.
- **Intermediate:** Developer can use existing modelled flood and flow data to construct a stage-discharge rating curve, which can be used to interpolate a flood level based on the required peak flow allowance to apply to the 'design flood' flow.
- **Detailed:** Perform detailed hydraulic modelling, through either re-running Environment Agency hydraulic models (if available) or construction of a new model by the developer.

Table A – Indicative guide to assessment approach

VULNERABILITY CLASSIFICATION	FLOOD ZONE	DEVELOPMENT TYPE		
		MINOR	SMALL-MAJOR	LARGE-MAJOR
ESSENTIAL INFRASTRUCTURE	Zone 2	Detailed		
	Zone 3a	Detailed		
	Zone 3b	Detailed		
HIGHLY VULNERABLE	Zone 2	Intermediate/ Basic	Intermediate/ Basic	Detailed
	Zone 3a	Not appropriate development		
	Zone 3b	Not appropriate development		
MORE VULNERABLE	Zone 2	Basic	Basic	Intermediate/ Basic
	Zone 3a	Basic	Detailed	Detailed
	Zone 3b	Not appropriate development		
LESS VULNERABLE	Zone 2	Basic	Basic	Intermediate/ Basic
	Zone 3a	Basic	Basic	Detailed
	Zone 3b	Not appropriate development		
WATER COMPATIBLE	Zone 2	None		
	Zone 3a	Intermediate/ Basic		
	Zone 3b	Detailed		

Notes:

- Minor: 1-9 dwellings/ less than 0.5 ha | Office / light industrial under 1ha | General industrial under 1 ha | Retail under 1 ha | Gypsy/traveller site between 0 and 9 pitches
- Small-Major: 10 to 30 dwellings | Office / light industrial 1ha to 5ha | General industrial 1ha to 5ha | Retail over 1ha to 5ha | Gypsy/traveller site over 10 to 30 pitches
- Large-Major: 30+ dwellings | Office / light industrial 5ha+ | General industrial 5ha+ | Retail 5ha+ | Gypsy/traveller site over 30+ pitches | any other development that creates a non-residential building or development over 1000 sq m.

Based on the above table and notes, the proposed development would be categorised as Minor and Basic.

Where the Environment Agency and the applicant and / or their consultant has agreed that a 'basic' level of assessment is appropriate the figures in Table B below can be used as a precautionary allowance for potential climate change impacts on peak 'design' (i.e. 1% annual probability) fluvial flood level rather than undertaking detailed modelling.

Table B – Local precautionary allowances for potential climate change impacts

Watercourse	Central	Higher Central	Upper
All	0.15m	0.24m	0.48m

The above suggests the 'central' climate change allowance for the epoch that most closely represents the lifetime of the development is their minimum benchmark for flood risk mitigation.

Modelled data obtained from the Environment Agency is shown in Table C below. The original document is embedded here for reference together with a map showing the region along with flood levels.

 
GMMC5386CC_TABL GMMC5386CC_MA
E 1A Turnlee Road.p P 1A Turnlee Road.p

Table C – Modelled fluvial flood data for Long Clough Brook

Watercourse	Watercourse Reference	Location	Reference	Asset	Floodplain		Drainage	
					1% AEP (1 in 100 years)	0.1% AEP (1 in 1000 years)	1% AEP (1 in 100 years)	0.1% AEP (1 in 1000 years)
Long Clough Brook		403009	393444	Modelled Water Level (m aodN)	152.04	152.25	152.63	153.28
				Modelled Flow (cumecs)	23.03	44.24	23.55	44.17
		403040	393470	Modelled Water Level (m aodN)	151.93	152.63	151.64	152.63
				Modelled Flow (cumecs)	23.59	45.74	23.57	45.10
		403000	393460	Modelled Water Level (m aodN)	151.43	151.73	151.42	151.70
				Modelled Flow (cumecs)	23.51	45.31	23.58	45.20
		402970	393453	Modelled Water Level (m aodN)	150.66	151.10	150.66	151.20
				Modelled Flow (cumecs)	23.82	35.26	23.50	38.50
		402974	393511	Modelled Water Level (m aodN)	150.35	151.01	150.35	151.62
				Modelled Flow (cumecs)	22.10	33.80	26.19	33.76
		402988	393500	Modelled Water Level (m aodN)	149.77	150.37	149.77	150.33
				Modelled Flow (cumecs)	23.67	41.25	23.65	41.02
2D Floodplain Levels		402944	393570	Modelled Water Level (m aodN)	149.07	149.63	149.07	149.66
				Modelled Flow (cumecs)	23.80	40.46	23.60	40.32
		402909	393509	Modelled Water Level (m aodN)	148.41	148.52	148.41	148.51
				Modelled Flow (cumecs)	12.20	16.64	12.24	16.72
		402968	393462	Modelled Water Level (m aodN)	150.72	151.28	150.72	151.26
				Modelled Water Level (m aodN)	150.54	151.15	150.54	151.14
		402952	393508	Modelled Water Level (m aodN)	150.40	150.94	150.40	150.96

Model data taken from Long Clough Brook 2011 Study

Notes:

AEP - Annual Exceedance Probability

m aodN - metres above Ordnance datum Newlyn

cumecs - cubic metres per second

Tidal Flooding Sources

The site is not located within the vicinity of tidal flooding sources therefore this source has not been considered.

Flooding from rising/high groundwater

As no below surface infrastructure or buildings are proposed for this site, the site is not considered at risk of flooding from rising/high groundwater. The developer is advised however to adopt an appropriate surface management strategy to mitigate the risk.

Please see the planning application which shows that the houses are raised with access at 0.6 metres above the ground.

Overland flow flooding

The site is not situated near to large areas of poor permeability and therefore has a low risk of overland flow flooding.

Flooding from artificial drainage systems or infrastructure failure

United Utilities is responsible for the disposal of waste water and supply of clean water. Information contained within the High Peak Borough Council SFRA is provided at a five-digit postcode level indicating that there is a low level of flood risk posed by this source.

Historic flooding

The British Hydrological Society (Chronology of British Hydrological Events) has no records of flooding in the immediate area. No other historical records of flooding for the site have been recorded. Also, Mrs Thompson, the applicant, has lived permanently at this address since 1960 and has not experienced any flooding during this time.

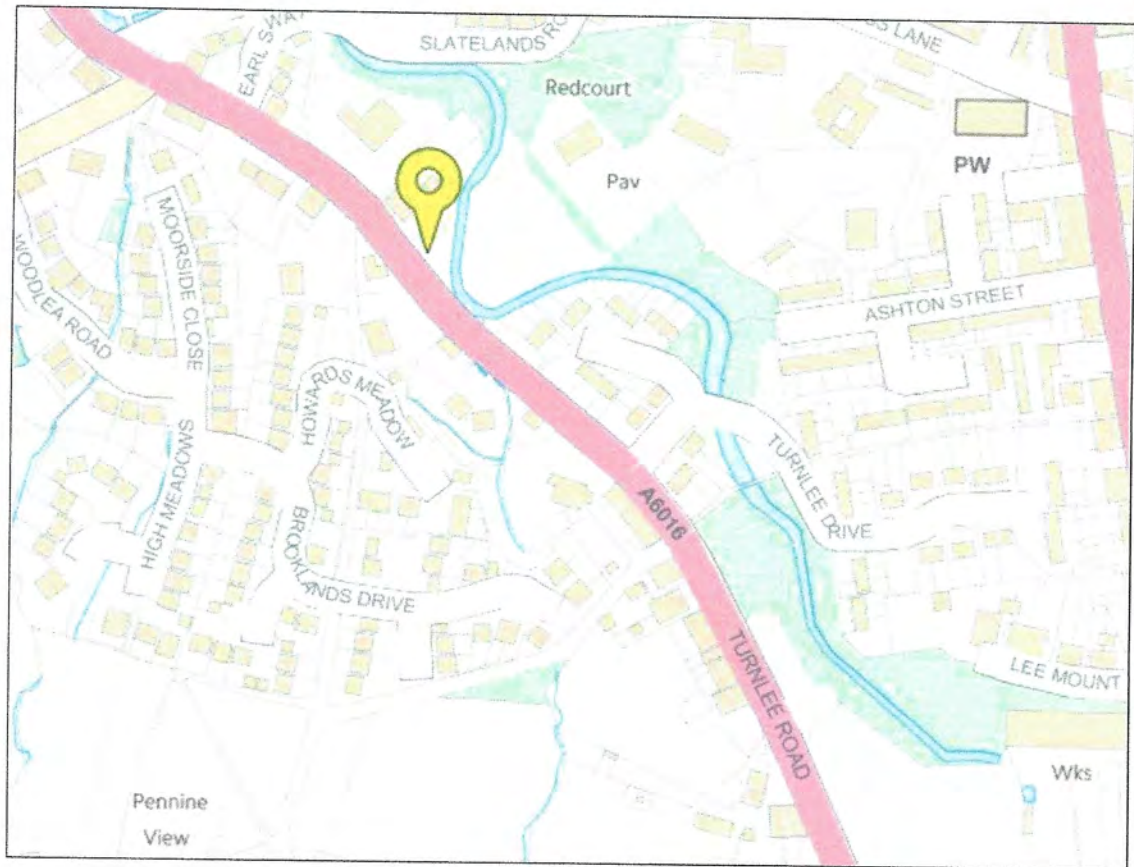
Conclusion

Table 2 of the Planning Practice Guidance shows that the proposed development in planning application HPK/2016/0675 is classified as less vulnerable. Of the four of the six sources of flooding considered to be a potential risk, all are assessed as low probability and hence low risk factor, and the plans for the dwellings show that suitable mitigation has been considered and indeed implemented by raising access to them by 0.6 metres.

The extent of flooding associated with adjacent watercourses does not appear to extend to the development site.

This FRA therefore shows no concerning factors for preventing the outline planning application.

FRA prepared by Mr Paul Harris in accordance with the informative guidance provided via HM Government planning and environmental websites together with information provided by the Environment Agency.



Appendix of Photographs

1. Looking down on proposed site (taken from bedroom window at 1A Turnlee Road)



2. Looking to drive corner of proposed site (taken from bedroom window at 1A Turnlee Road)



3. Proposed site from entrance of drive



4. Proposed site looking to drive entrance



5. Looking to proposed site from existing walled garden



6. Proposed site from bend in Long Clough Brook (where Long Clough Brook runs by road)



7. End and middle of proposed site from opposite side of Long Clough Brook



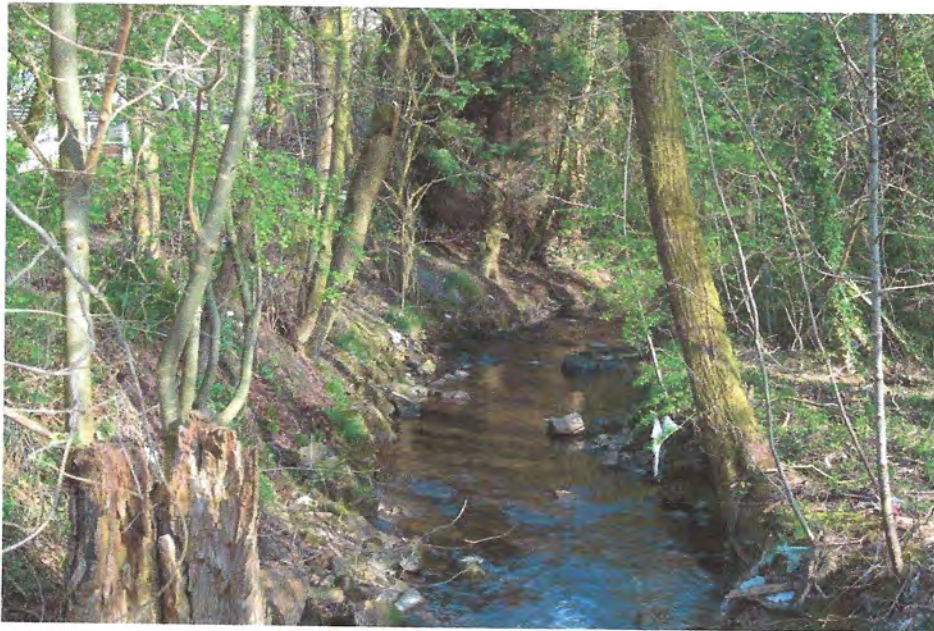
8. 1A Turnlee road from next to corner bend of Long Clough Brook



9. 1A Turnlee Road drive bend from Long Clough Brook



10. Long Clough Brook boundary to 1A Turnlee Road



11. Example of depth of lowest point of banking of Long Clough Brook up to 6 feet using 1 foot spacing

