



Dorset
Council

Flood Investigation Report
Broadmayne
August 2020

Flood Investigation Report



Broadmayne
27th August 2020 Event



Contents

1. Introduction	3
2. Risk Management Authority Responsibilities	4
3. Catchment Characteristics	6
3.1 Geology	6
3.2 Hydrology	7
3.3 Flood Risk	7
3.4 Future Flood Risk	8
4. Incident Summary	8
4.1 Rainfall data	9
4.2 Groundwater Records	10
4.3.1 Main Street	10
4.3.2 Cowleaze Road	12
4.3.3 Watergates Lane	14
4.3.4 Rectory Road	15
5 Quick Wins	16
6 Recommended Actions	18
7 Next Steps	19
Appendix 1 - Term Definition	20
Appendix 2 - Location of the Study Area	21
Appendix 4 - Detailed Watercourse and Surface Water Mapping	22
Appendix 5 - Photos of the Flooding Incident	23
Appendix 6 - Digital Surface Terrain Modelling of Broadmayne	24



1. Introduction

The Flood Risk Regulations 2009 and the Flood and Water Management Act 2010 (the Act) have established unitary and upper tier local authorities as the Lead Local Flood Authority (LLFA) for their area. This has placed several responsibilities on the LLFA in relation to flood risk management and in particular Section 19 of the Act which states:

**Flood and Water Management Act 2010: Section 19 – Local Authorities:
investigations**

- 1) On becoming aware of a flood in its area, a lead local flood authority must, to the extent that it considers it necessary or appropriate, investigate -
 - a) Which risk management authorities have relevant flood risk management functions, and
 - b) Whether each of those risk management authorities has exercised, or is proposing to exercise, those functions in response to the flood.
- 2) Where an authority carries out an investigation under subsection (1) it must -
 - a) Publish the results of its investigation, and
 - b) Notify any relevant risk management authorities.

When considering if it is necessary or appropriate to investigate a flood event Dorset Council will review the severity of the incident, the number of properties affected and the frequency of such an occurrence. Our Local Flood Risk Management Strategy clearly sets out the criteria to be used when considering a Flood Investigation Report; <https://www.dorsetcouncil.gov.uk/emergencies-severe-weather/flooding/managing-flood-risk/managing-flood-risk.aspx>

This report has been produced to comply with legislation and to determine the main causes of the flooding. Each affected area will have several recommended actions to be taken forward by the relevant Risk Management Authorities (RMA's) or in some cases, by the landowner or local community.

2. Risk Management Authority Responsibilities

The general Risk Management Authority (RMA) responsibilities in relation to flood risk and surface water management are outlined below:

The Environment Agency (EA) is responsible for managing flood risk from the sea, main rivers and reservoirs and has a strategic overview role for all flood risk management. It is a key local partner for DC, especially when managing the risk from combined sources and in the event of a large flood incident. The EA also provides a flood warning service throughout England and Wales in areas at risk of flooding from main rivers or the sea.

Dorset Council as the Lead Local Flood Authority (DC LLFA) is responsible for the management of flood risk from local sources, including ordinary watercourses, groundwater and surface water runoff. It is also responsible for consenting to works and enforcing the removal of any unlawful structure or obstruction within ordinary watercourses. The LLFA must also prepare a Local Flood Risk Management Strategy, maintain a record of flood risk assets and undertake investigations. It is also a statutory planning consultee for the management of surface water drainage to major developments (ten or more houses and commercial development of floor space greater than 1000m² or sites larger than 1Ha).

Since merging with the District Councils in April 2019, certain functions and responsibilities now come under Dorset Council. For example, the preparation of Development Plans, and offering discretionary comments regarding flood risk on minor planning applications. There are also powers under the Public Health Act 1936 to ensure the removal of any blockage within an ordinary watercourse that is considered a nuisance.

Dorset Council as the Highway Authority (DC HA) maintains the highway drainage system to reduce the amount of standing water on the highway. This is achieved by managing surface water on the roads via the maintenance of highway drainage infrastructure.

Water and Sewerage Companies (Wessex Water) Water and Sewerage Companies are responsible for managing the risks of flooding from surface water and foul or combined sewer systems providing drainage from buildings and yards.

Highways England (HE) is responsible for managing, maintaining and improving the motorways and trunk roads across England and any associated drainage and flood risk.

Table 1 – Risk Management Authority Responsibilities

Flood Source	Environment Agency	DC Lead Local Flood Authority	Wessex Water	DC Highway Authority
RIVERS				
Main river	✓			
Ordinary watercourse		✓		
SURFACE RUNOFF				
Surface water		✓		
Surface water (<i>originating from the highway</i>)				✓
OTHER				
Sewer flooding			✓	
The Sea	✓			
Groundwater		✓		
Reservoirs	✓			

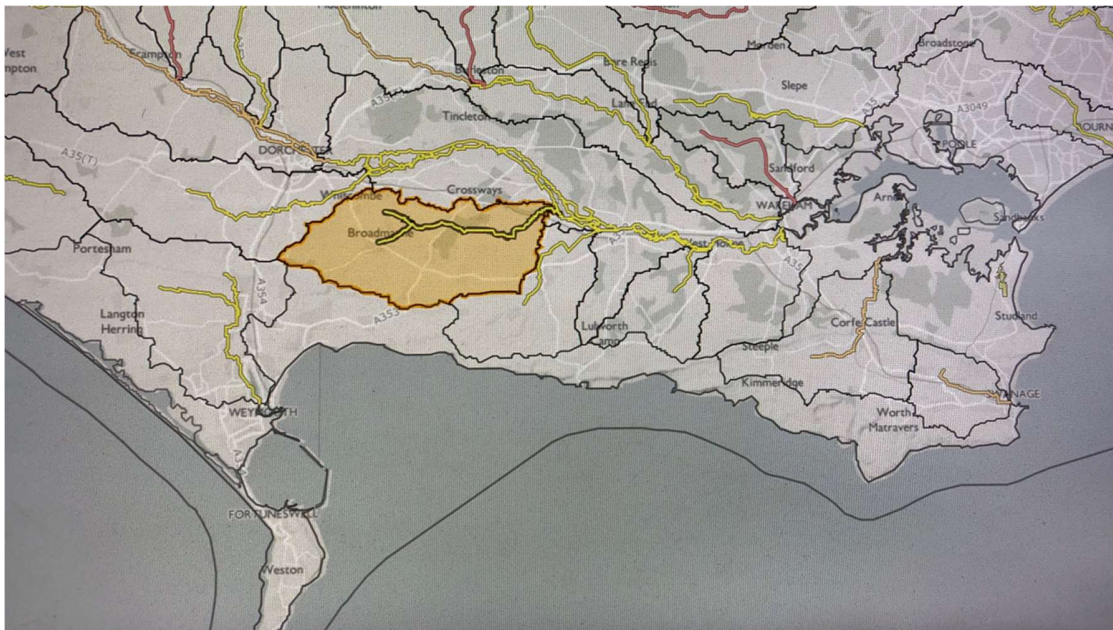
All RMAs have a duty to co-operate and to share information in relation to their flood risk management functions.

Land/Property Owners that have a watercourse in or adjacent to their land have riparian responsibilities on that watercourse. This means the landowner must:

- Let water flow through their land without any obstruction, pollution or diversion which affects the rights of others.
- Accept flood flows through their land, even if these are caused by inadequate capacity upstream.
- Keep the banks clear of anything that could cause an obstruction and increase flood risk, either on their land or downstream if it is washed away.
- Maintain the bed and banks of the watercourse and the trees and shrubs growing on the banks and should also clear any litter or debris from the channel and banks, even if it did not come from their land and to keep any structures, such as culverts, trash screens and debris grills, weirs and mill gates, clear of debris.

3. Catchment Characteristics

Broadmayne is a village in the English county of Dorset. It lies two miles south-east of the county town of Dorchester. The A352 main road between Dorchester and Wareham passes through the centre of the village. The village lies within the Tadmoll Brook catchment.



Broadmayne has a catchment area of 46806 m².

3.1 Geology

The geology at Broadmayne is described within the British Geological Survey records as having superficial deposits comprising of clay, silt, sand and gravel. These deposits formed up to 3 million years ago in the Quaternary Period, the local environment had been previously dominated by subaerial slopes.

Bedrock is of chalk formation, sedimentary bedrock formed approximately 72 to 84 million years ago in the Cretaceous Period, the local environment had been previously dominated by warm chalk seas.

3.2 Hydrology

Broadmayne lies in the upper reaches of the Tadnoll Brook, this secondary river flows northeast from beyond the Bakers Paddock development.

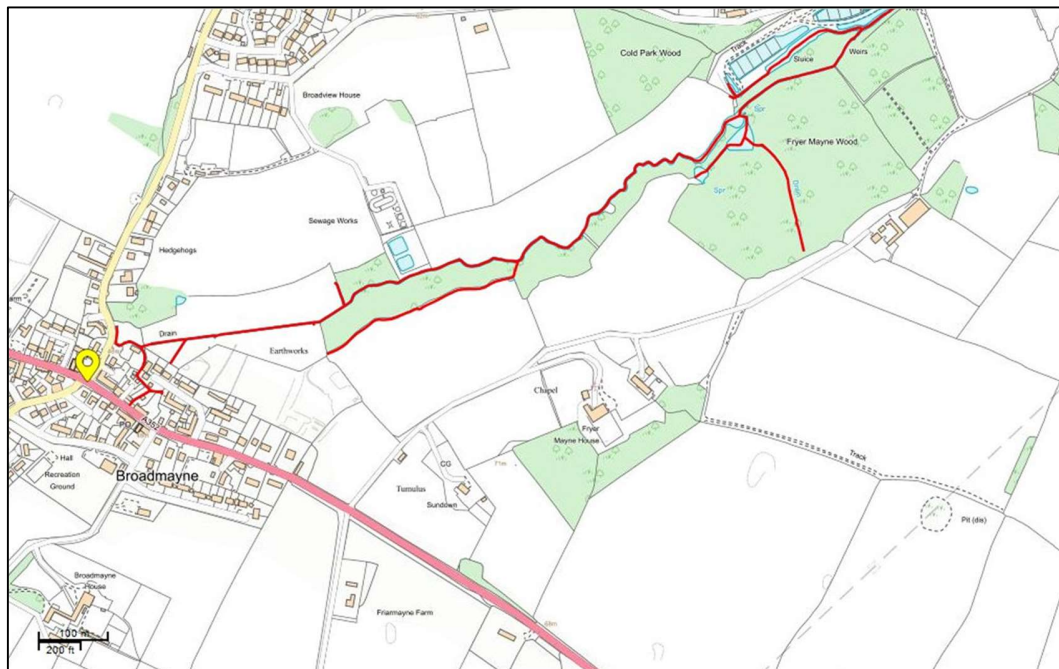


Figure 2 - Location of the Ordinary Watercourses in Broadmayne.

3.3 Flood Risk

The Environment Agencies flood zone maps show that the village of Broadmayne falls wholly within flood risk zone 1, with a portion also within the 1 in 100yr risk of flooding from surface water.

There has been some recorded history of pluvial surface water flooding in Broadmayne. Records show that significant flooding occurred in 1994, 2009 and 2000 as a result of heavy rainfall events leading to surface water flooding.

The flooding incident recorded on 27th August 2020 had again been the result of surface water flooding.

3.4 Future Flood Risk

Climate projections for the next 100 years in the UK indicate that in the future there may be more short-duration high-intensity rainfall events and periods of long-duration rainfall may become more frequent. This may result in increased risk of flooding.

4. Incident Summary

Across the Wessex area, rainfall for August was 'above normal' for the time of year at 157% Long-Term Average. Rainfall in the Frome catchment was 'notably high' in August at 180% Long Term Average. The month started dry, with rainfall concentrated in the

second half of the month. 22% of the month's rainfall fell on 27th August. (*Environment Agency Water Situation Report for the Wessex Area: August 2020*).

During the afternoon of 27th August 2020, heavy rainfall fell on Broadmayne and the surrounding areas. Surface water flowed from higher areas to several lower areas including Main Street, Cowleaze Road and Watergates Lane. The intensity and volume of water inundated the highway drainage system, and in Rectory Road it also resulted in surcharging of the Wessex Water public foul sewer.

Residents reported:

- Concerns about the lack of maintenance of the Highways drainage assets, particularly in Main Street and Osmington Drove.
- Difficulty in encouraging passing vehicles to slow down and understand the harm caused by bow waves to adjacent properties.
- Foul sewer flooding in Rectory Road, in most cases to the gardens of properties.
- The benefit of the support of the Broadmayne Parish Council flood warden, Cllr Richard Macer-Wright in assisting with sandbags etc.
- The dropped kerbs by the village shop in Main Street that allowed surface water from the highway to reach properties.

A total of 10 properties experienced internal flooding as a result of the flood event, the affected locations are discussed in more detail in Section 4.3.

Table 2 Summary of properties flooded,
(Based on approximate numbers reported and brought to our attention during this investigation).

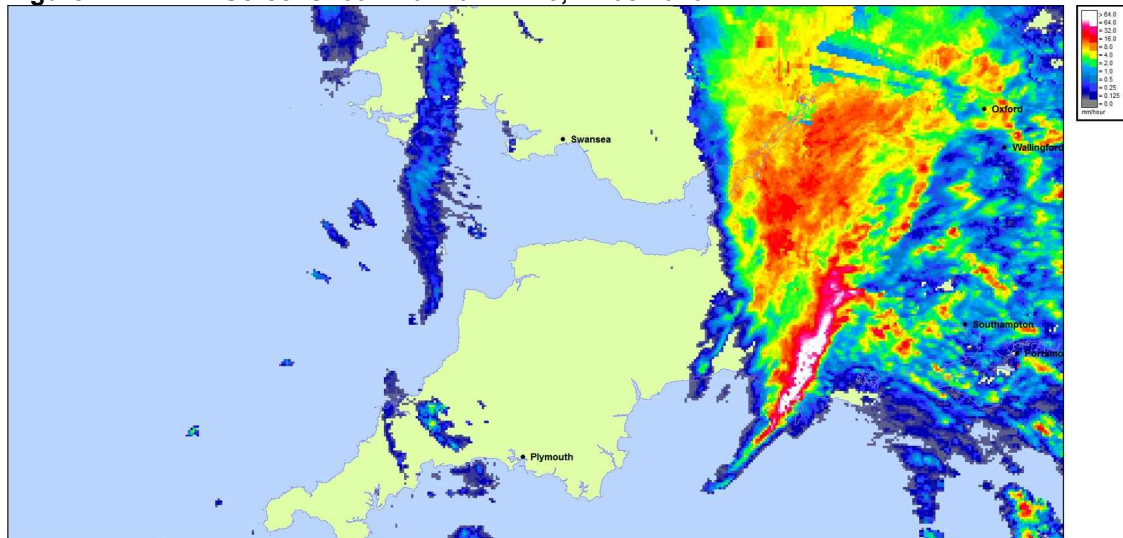
Location	Number of properties flooded internally	Incident Date	Main source(s) of flooding during incident
Main Street	5	27/08/2020	Surface water
Cowleaze Road	3	27/08/2020	Surface water
Watergates Lane	1	27/08/2020	Surface water
Rectory Road	1	27/08/2020	Surface water inundating the public foul sewer.

NB: It should be noted that this report is based only on the information brought to the attention of Dorset Council and reported on the FORT recording system, it does not guarantee an exact list of affected properties during this reported event.

4.1 Rainfall data

Intense rainfall was evident in Dorchester on 27th August and supported by Met Office rainfall radar data. The radar data shows that there was an intense downpour between about 3:20 and 3:35pm, with an estimated 15mm falling in 15 minutes, equating to a return period of 1 in 9 years.

Figure 4- HYRAD Screenshot – Rainfall 14:25, 27/08/2020



4.2 Groundwater Records

The EA maintains a network of groundwater monitoring stations across the country, which are used to monitor and inform management of groundwater resources. The nearest monitoring station is at Ashton Farm, a Water Level (Groundwater) Gauge. It is located near to the town of Martinstown or Winterborne St Martin. Broadmayne is 7.5 miles to the Southeast of Martinstown.

Groundwater levels at Ashton Farm increased slightly towards the end of August. Groundwater flooding was not experienced during the event of the 27th August.

4.3 Locations Affected

This section provides site specific information on the areas of Broadmayne affected by the flood event of the 27th August. Namely, Main Street, Cowleaze Road, Watergates Lane and Rectory Road.

4.3.1 Main Street

The highways drainage gullies were overwhelmed by the intensity of the rainfall event, and the capacity and effectiveness of the gullies had been further reduced by the high level of silt present in the system at the time of the event. Pluvial surface water flowed from Osmington Drove, to the lowest area along Main Street near to the village shop. Several properties were affected due to the low threshold of their entrances, and through air vents in the front elevations.

The dropped highway kerb near to number 40 Main Street allowed surface water to mount the pathway and flow towards property, if these kerbs were to be replaced by regular kerb stones then the risk to property could be reduced.

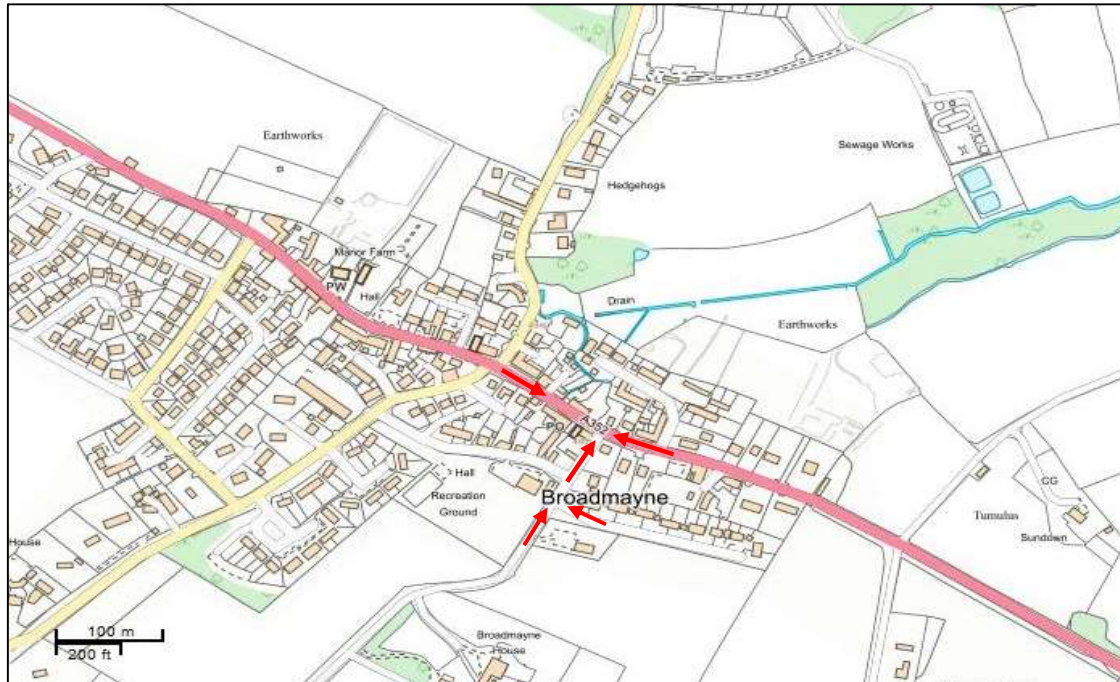
The bow waves from passing vehicles not slowing sufficiently, increased the flood risk to property.

Photo 1 – Broadmayne High Street



Reducing Flood Risk

- Discuss the Highways drainage maintenance regime for Main Street and Osmington Drove.
- Discuss the Removal of drop kerbs where not required.
- Temporary flood signs to inform passing motorists of the risk to vehicles, residents and property.
- Consider requesting the closure of Main Street by Dorset Police during extreme rainfall events.
- Discuss property flood resilience measures with property owners.



Main Street - Overland Flow Paths

4.3.2 Cowleaze Road

Cowleaze road runs parallel to Main street, Pluvial surface water from Osmington Drive and High Trees flowed towards numbers 1,2 & 3 in Cowleaze Road.

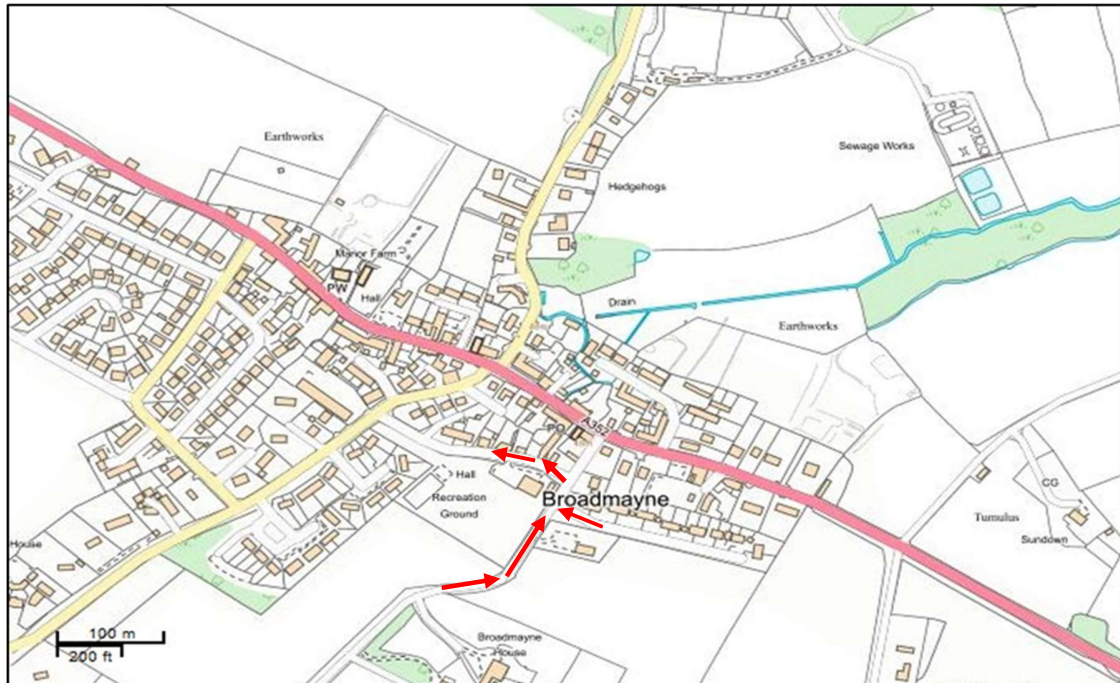
The highways gullies in Cowleaze Road, High Trees and Osmington Drive were overwhelmed by the intensity of the rainfall event, overland surface water flows missed many of the highway gullies partly due to their location and the previous highway resurfacing works.

Reducing Flood Risk

- Discuss the Highways drainage maintenance regime for Cowleaze road and Osmington Drive.
- Discuss property flood resilience measures with property owners.



Example of a gully in Osmington Drove.



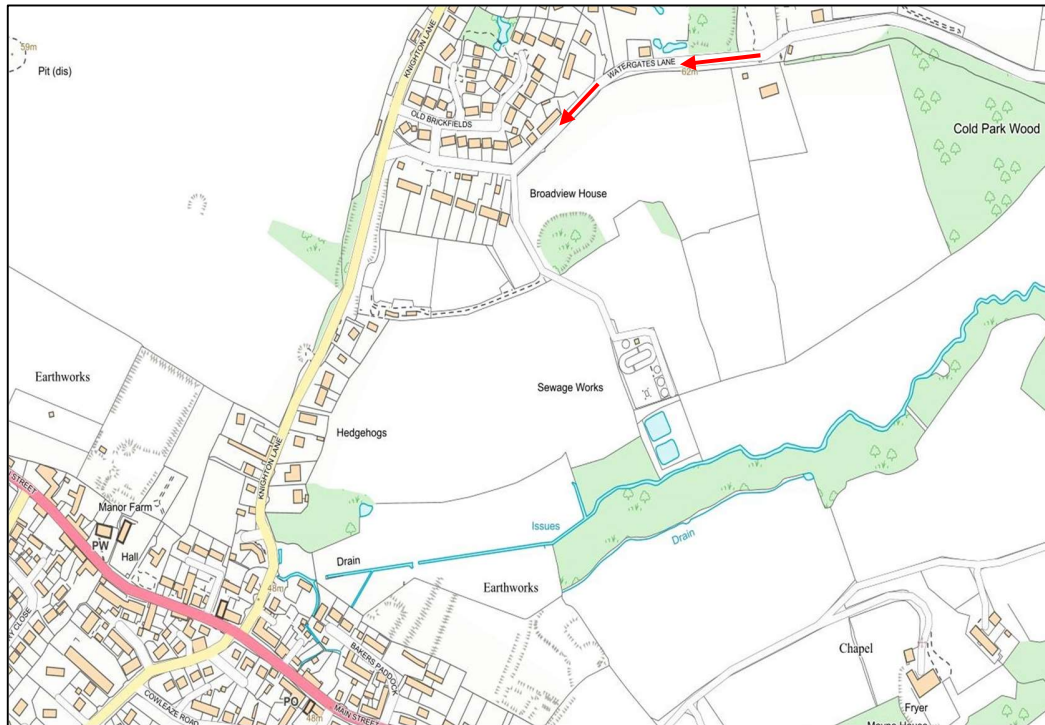
Cowleaze Road – Overland Flow Paths

4.3.3 Watergates Lane

The lane has a loose stone surface and no surface water drainage. The storm on the 27th August resulted in flooding to a single property situated at the lowest level in the lane.

Reducing Flood risk

- Discuss property flood resilience measures with property owners.
- Ensure that residents are aware of the Dorset Council sandbag policy. They should take appropriate preparedness measures, and obtain and store sandbags when alerted by Environment Agency flood warning reports.
- The flood action plan for Broadmayne should be updated to include Watergates Lane.
- The sandbag store at Broadmayne is located at the Village Hall.



Watergates Lane – Overland Flow Paths

4.3.4 Rectory Road

Rectory Lane suffered flooding as a result of a Highways drainage scheme overwhelming the Wessex Water public foul sewer. The Highways drainage connection to the public foul sewer is an historic connection and should be review following a site visit with Wessex Water.

Reducing Flood Risk

- Discuss a scheme with Dorset Highways to discharge Highways surface water elsewhere, with the aim of removing the existing discharge connection to the Wessex Water public foul sewer.



Rectory Road – Overland Flow Paths

5 Quick Wins

As part of the on-going investigation, there are a few quick win schemes to reduce the impact of flooding were identified, these could be implemented by the relevant risk management authorities or landowner.

Table 3 - Quick Wins for Broadmayne

Quick wins
<ul style="list-style-type: none">• Following the rainfall event on the 27/8/2020 arrange for Dorset Highways to clear highway gullies of silt in Main Street, Osmington Drove and High Trees.• Make the Parish Council and residents aware of links and telephone numbers to request highway drainage maintenance and to report flooding on FORT.• The Parish Council to consider the purchase of temporary flood signs.
<ul style="list-style-type: none">• Identify nearest sandbag store locations.

6 Recommended Actions

As a result of this investigation report, several recommendations have been made for actions to be taken in specific locations. These are either as a result of initial site or desktop investigations, or the continuation of works or investigations already in progress.

Table 1 Recommended Actions for Broadmayne

Action By	Recommended Action	How
Parish Council / Environment Agency and Lead Local Flood Authority	Increase community resilience to flood events.	The relevant authorities will help assist the PC and flood warden Cllr Richard Macer-Wright with the updating of the community flood action plan.
Parish Council	To explore the purchase of temporary flood signs. This would inform drivers of the flood risk. These would be most useful stored locally to Main Street, (residents have offered to store them).	Using Dorset Council highways sign store specification.
Parish Council	To consider road closure of Main Street during flood events to prevent bow waves from vehicles entering properties.	To add this to the flood action plan for the village. Request that Dorset Council or the Police close the road if required.
Property Owners	Consider flood resilience measures to affected properties.	Advise property owners to consider installing flood resilience measures where necessary.
DC Highways Authority / Lead Local Flood Authority	To explore the removal of the two unnecessary dropped kerbs outside number 38 Main street by the village shop.	LLFA to work with Highways to investigate this.



Dorset Highways Authority	To explore the feasibility of an alternative scheme to discharge Highway surface water in Rectory Road.	Identify options to remove the Highway drain connection to the Wessex Water public foul sewer.
Dorset Highways Authority	Investigate the integrity and performance of surface water drainage assets in Main street, Cowleaze road and Osmington Drove.	Meet with the Highways officer for Broadmayne to discuss the condition of assets, and changes to the future maintenance regime.
Lead Local Flood Authority / Parish Council	Review and monitor the delivery of recommendations within this flood investigation report	Set up a stakeholder group to monitor progress and report outcomes.

7 Next Steps

The next steps following this report will be for Dorset Council as the LLFA to ensure that the recommended actions are shared with the identified responsible organisations. It will work in partnership with the relevant authorities and the local community.

Where quick win schemes have been identified, these will be prioritised in line with other commitments. Any works requiring capital investment will be considered through normal funding routes.

The flood event of 27th August 2020 occurred during a worldwide pandemic (Covid 19), This will have an impact on the ability of stakeholders to action recommended measures within normal timelines.

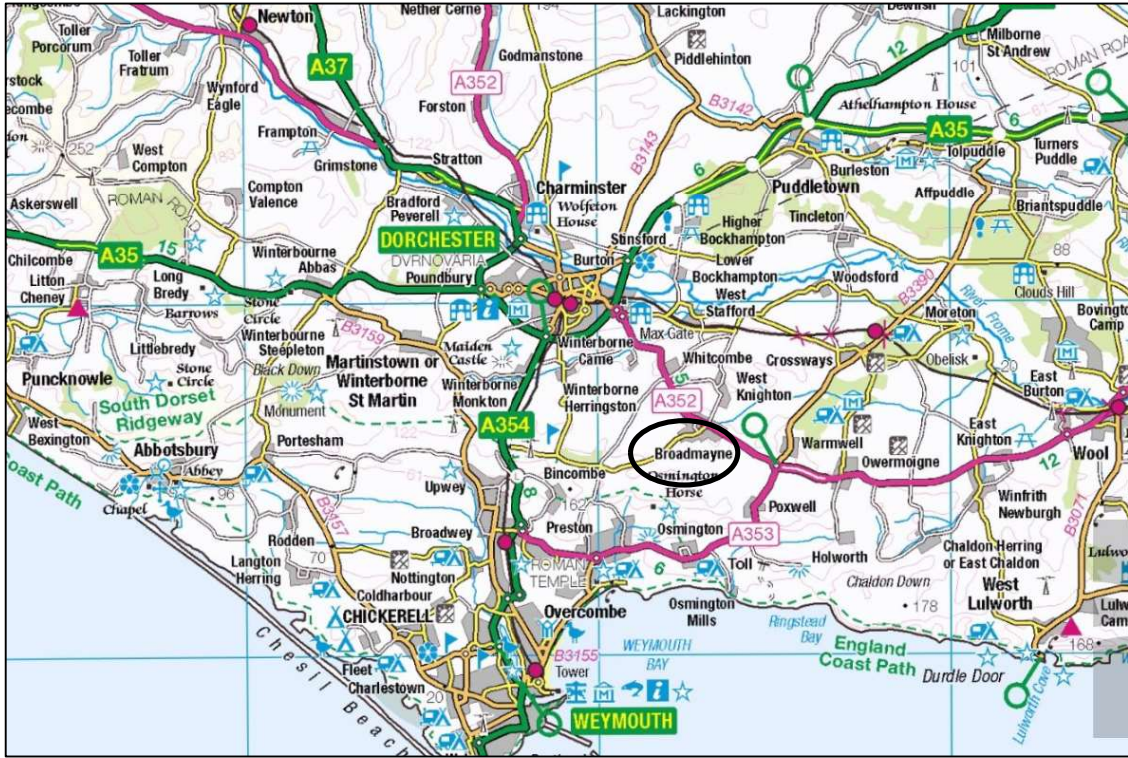


Appendix 1 - Term Definition

Catchment	An extent or an area of land where all surface water from rain, melting snow or ice converges to a single point at a lower elevation
Culvert	A covered channel or pipe designed to prevent the obstruction of a watercourse or drainage path by an artificial construction.
Fluvial Flooding	Flooding resulting from water levels exceeding the bank level of a river or stream
Groundwater flooding	Occurs when water levels in the ground rise above the natural surface. Low lying areas underlain by permeable strata (e.g. Chalk) are particularly susceptible.
Main River	All watercourses shown as such on the statutory main river maps held by the Environment Agency and the Department of Environment, Food and Rural Affairs for which the Environment Agency has responsibilities and powers.
Natural Flood Management	Natural flood management involves working with nature to try and 'slow the flow' of water across a landscape. There are a variety of techniques that can be used, including; land management to improve the soils ability to hold water, while flow paths are intercepted by cross drains, earth bunds, leaky ponds, hedges, and grass buffers. These measures also help reduce soil erosion which ends up in road gullies and ultimately in the rivers and streams requiring maintenance to remove the build-up of silt.
Ordinary Watercourses	All watercourses that are not designated Main River, and which are the responsibility of local authorities or Internal Drainage Boards (IDBs)
Resilience Measures	Measures designed to reduce the impact of water that enters property and businesses; could include measures such as raising electrical appliances.
Resistance Measures	Measures designed to keep flood water out of properties and businesses; could include flood guards for example.
Surface water/runoff	Rainwater (including snow and other precipitation) which is on the surface of the ground (whether or not it is moving), and has not entered a watercourse, drainage system or public sewer. The term 'surface water' is used generically to refer to water on the surface.



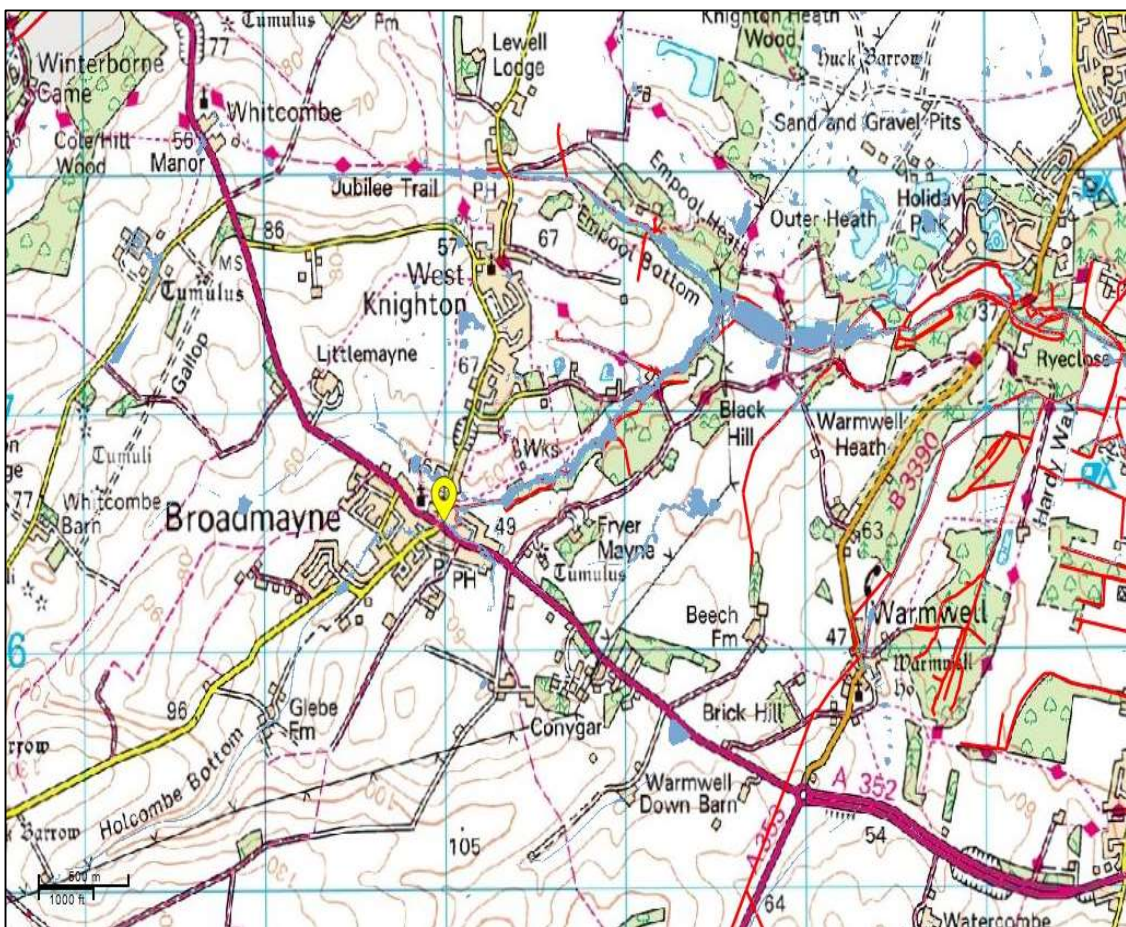
Appendix 2 - Location of the Study Area





Appendix 4 - Detailed Watercourse and Surface Water Mapping

(Surface water mapping showing a 1:100-year Flood Event)



Appendix 5 - Photos of the Flooding Incident



Pictures of Main Street.

Appendix 6 - Digital Surface Terrain Modelling of Broadmayne.

