

**27 July – 1 August 2019
Flooding in Lancashire**

**Flood & Water Management Act 2010
Section 19 Investigation Report
November 2024**



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Executive Summary

Over the period from 27-29 July 2019, summer storms impacted on Lancashire with high winds and heavy downpours of rain which temporarily overwhelmed local drainage systems and caused extensive flooding of properties and highways. Then a further rainfall event on 1 August 2019 caused flooding to additional properties around Lancashire. Because of the multiple impacts occurring so close together in time, the council has decided to interpret these events as one weather event for the purposes of the investigation.

From the records provided after the event by affected people and by Lancashire's flood risk management authorities, we have found that 102 properties flooded during this event: 91 homes and 11 commercial/agricultural properties. Of the affected homes, 14 were flooded internally to at least one habitable room. We also have a report that a further property flooded although the occupants have not confirmed details of whether this was residential or business premises, internal or external flooding (a possible total of 103 properties).

A report under Section 19 of the Flood & Water Management Act 2010 is required to document the investigations made into the localised flood events occurring in the period 27 July to 1 August 2019 that have been reported to the Council either directly by our residents or their representatives, or via the flood risk management authorities if they received the first reports directly. This report is required to identify where further studies or works are needed, and by which risk management authority. Appendix A to this covering report provides that documentation.

The risk management authorities that had a role in this flooding incident were:

- a) Lancashire County Council as the lead local flood authority;
- b) Lancashire County Council as the highway authority; and
- c) United Utilities plc as the water company.

In regard to this event, none of the flood risk management authorities have any outstanding studies to be completed, although there will always be the potential for alterations to existing assets to better manage the future risks of flooding.

It is a key finding of this Section 19 investigation that the reported flooding was principally in urban locations where the drainage systems were temporarily overwhelmed by the intensity of the rainfall. There are currently no programmes of investment to increase the general capacity of such drainage systems.

There are achievable and sustainable responses available for communities seeking improved protection from similar rainfall events should these occur in the future. Depending on particular local circumstances responses might include any combination of the following suggestions:



- Improved drainage system maintenance regimes;
- Increased area of absorbent land within urbanised streets (for example more trees and shrubs, increased unpaved areas in highways, gardens & yards);
- Localised temporary road closures to reduce bow waves washing off streets onto private property;
- Improved protection against water-ingress at vulnerable properties;
- Improved 'warning and informing'-type communications to trigger appropriate action, temporary defences etc.

Measures of these types can be very effective at more safely managing the peaks of an intense rainstorm, and at giving local people more control over the way they are affected in such weather conditions. All the flood risk management authorities are ready and willing to work with local community groups and Town/Parish Councils to identify and introduce measures appropriate for their local circumstances. We are all committed to finding better ways to make our offers more widely known about, and to helping people to access our teams for advice.

Any individuals who want to consider what they might do for themselves will find practical and realistic suggestions on the dedicated North West Flood Hub (thefloodhub.co.uk)

Working with communities and working in partnership are key recommendations of the national flood risk management strategy.



SECTION 1 – INTRODUCTION AND PURPOSE OF THE REPORT

1.1 Flood & Water Management Act 2010 Duty

1.1.1 Lancashire County Council as a lead local flood authority has a duty to investigate flooding in accordance with Section 19 of the Flood and Water Management Act 2010 (the Act) as follows:

1.1.2 Section 19 states:

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.

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.

1.1.3 The terms 'risk management functions' and 'risk management authorities' are defined in Section 2 of this report.

1.2 Lancashire & Blackpool Local Flood Risk Management Strategy

1.2.1 In addition to the requirements of Section 19 of the Act, the Lancashire and Blackpool Local Flood Risk Management Strategy sets out how flood risk should be managed locally.

1.2.2 This Strategy states that the Section 19 investigations will help to:

- Improve the understanding of flood risk by providing an invaluable tool for understanding the sources and mechanisms of flooding;
- Identify assets that have a flood risk management function, which may need to be designated; and
- Identify where additional works and studies are likely to be necessary, that the county council or other risk management authorities can integrate into their prioritised flood risk management plans.



SECTION 2 - DEFINITIONS AND RESPONSIBILITIES

2.1 Key Definitions

2.1.1 The Risk Management Authorities

2.1.1.1 The risk management authorities are identified in the Act as follows:

- a. The Environment Agency,
- b. The lead local flood authority,
- c. A district council for an area for which there is no unitary authority,
- d. An internal drainage board,
- e. A water company, and
- f. A highway authority.

2.1.1.2 Each of these organisations has powers and duties under various legislation and regulations for the responsible management of natural water, flood risk and in some cases coastal erosion.

2.1.1.3 The Act requires all the flood risk management authorities to cooperate with other relevant authorities in the exercise of their flood and coastal erosion risk management functions.

2.1.1.4 In Lancashire, the flood risk management authorities support partnership working in the following ways:

- at operational levels by joint investigations and through the Operational Making Space for Water meetings;
- at tactical level by sharing priorities and direction between organisational managers, and
- at strategic level by engaging with Councillors/Cabinet Members/Senior Managers.

2.1.1.5 Lancashire, Blackpool and Blackburn-with-Darwen are also represented on the North West Regional Flood and Coastal Committee where cross-boundary projects, resources and data are shared with Cumbria, Greater Manchester, Merseyside and Cheshire.

2.1.1.6 The village of Earby in Pendle District is a special case in that it lies within a river catchment that falls towards North Yorkshire, so its local Environment Agency services are supplied through the Yorkshire team. This gives the Lancashire partnership a direct connection to the Yorkshire Regional Flood & Coastal Committee. Earby also receives services from the Earby and Salterforth Internal Drainage Board, which replaces a number of the lead local flood authority functions.

2.1.2 The Risk Management Functions

2.1.2.1 The risk management authorities have responsibility for flood risk management functions as defined under Section 4 (2) of the Act:

- (a) a function under this Part,



- (b) a function under section 159 or 160 of the Water Resources Act 1991,
- (c) a flood defence function within the meaning of section 221 of that Act,
- (d) a function under the Land Drainage Act 1991,
- (e) a function under section 100, 101, 110 or 339 of the Highways Act 1980, and
- (f) any other function, under an enactment, specified for the purposes of this section by order made by the Minister.

2.1.3 Riparian Landowners

2.1.3.1 The legal term 'riparian' is applied to landowners who own land adjoining or containing a river or watercourse. They have certain rights to use the water flowing across their land for their own purposes, and in regard to flood risk management they also have a number of responsibilities, including the following:

- to maintain the bed and banks of the watercourse, and also the trees and shrubs growing on the banks;
- to clear any debris, even if it did not originate from their land. This debris may be natural or man-made;
- to keep any structures within their ownership clear of debris. These structures include culverts, trash screens, weirs and mill gates .

2.1.3.2 If riparian landowners do not fulfil their responsibilities, they may face enforcement action taken by the relevant risk management authorities.

2.1.4 Interconnections between responsibilities

2.1.4.1 Public sewers in Lancashire are principally the responsibility of United Utilities plc or Yorkshire Water plc. Copies of the record maps indicating the location of public sewers in Lancashire are held in the water companies' head offices. These companies also keep records of pumping stations, and any water treatment works which form part of the public sewage system.

2.1.4.2 Private drainage systems are the responsibility of each owner whose property it drains. Where more than one property uses a private pipe, responsibility is normally shared proportionately. The private system comprises all the pipes up to the point of connection with a public sewer (this can include the entire system where it is connected to a septic tank, cesspool or soakaway). Formal records indicating the location of private drainage systems are not held by any of the risk management authorities. The deeds of a property may include these details.

2.1.4.3 The highway surface water drainage of all adopted public roads, other than trunk roads or motorways, is the responsibility of the county council as the local highway authority, including roadside drainage gullies and certain roadside ditches. Drainage from trunk roads and motorways is the responsibility of National Highways. Drainage of private unadopted roads is normally the responsibility of private property owners who make use of or adjoin the road.

2.1.4.4 Land drainage comprises systems of rivers, watercourses, ditches, culverts, pipes, lakes, and ponds intended to drain water resulting from rainfall and flows from underground sources. Typically, the primary responsibility for maintaining flows in land

drainage systems lies with the riparian owner or owners. The lead local flood authority, Environment Agency, internal drainage board and/or local councils hold enforcement powers to use if the landowner/s default in their duties.

2.1.4.5 All drainage systems eventually discharge into the sea as the lowest possible point for water to collect. In Lancashire, this is at Morecambe Bay or the Irish Sea directly.

2.1.4.6 All drainage networks are formed from combinations of these systems to overcome historic demands of efficiency, simplicity, and convenience. For example, a highway gully may well connect to a length of highway drainage pipe before connecting to a private ditch, or a public surface water sewer, or directly to a main river. The original reasoning for these arrangements may now be forgotten or inappropriate for current needs, but the physical interconnection of drainage systems means that it is often impossible to tell just from looking at flood water exactly where the barrier to flow arises and therefore exactly which organisation may need to take remedial action.

2.1.4.7 It is therefore vital for the risk management authorities to share information and collaborate during investigations and that they are allocated to the appropriate organisation to lead.

2.2 Key Functions of the Flood Risk Management Authorities

2.2.1 Environment Agency

The flood risk management responsibilities of the Environment Agency include the following:

- a. strategic overview for all forms of flooding;
- b. provision of a National Strategy for Flood and Coastal Erosion Risk Management to cover all forms of flooding;
- c. a power to request information from third parties in connection with flood risk management duties. Risk management authorities have a duty to co-operate with the Environment Agency in the provision of such information;
- d. a duty to co-operate with other relevant authorities in the exercise of flood risk management functions, which may include the sharing of information with other relevant authorities;
- e. a duty to have regard to Local Flood Risk Management Strategies;
- f. a duty to be subject to scrutiny from lead local flood authorities' democratic processes;
- g. responsibility for managing coastal flooding;
- h. responsibility for managing fluvial flooding from main rivers;
- i. updated provisions for the regulation of reservoirs;
- j. permissive powers to carry out maintenance work on main rivers under Section 165 of the Water Resources Act 1991;
- k. the provision of flood forecasting and warning services;
- l. the provision of flood maps;
- m. the provision of flood related information and advice;
- n. investment in flood defences, supplemented through partnership funding where appropriate;

- o. a power to take enforcement action where flow in a main river has been impeded and may cause a flood risk.

2.2.2 Lancashire County Council

2.2.2.1 The county council has a dual risk management role, in its capacity as both highway authority and lead local flood authority.

2.2.2.2 The lead local flood authority has a number of duties and powers, in addition to the duty to investigate flooding set out above. These include:

- a. a duty to develop, maintain, apply, monitor and consult on a local flood risk management strategy for its area (copy available from the county council's website www.lancashire.gov.uk);
- b. a duty to develop and maintain a register of structures or features which might impact on flood risk, including ownership and condition (the Flood Risk Asset Register is available on the county council's website www.lancashire.gov.uk);
- c. the management of the consenting process for works that are likely to affect the flow characteristics of ordinary watercourses (Land Drainage Consent – guidance available on the county council's website www.lancashire.gov.uk);
- d. a power to undertake works for managing flood risk from surface run-off or groundwater;
- e. a power to request information from third parties in connection with flood risk management duties. Flood risk management authorities have a duty to co-operate with the lead local flood authority in the provision of such information;
- f. a power to designate structures and features that affect flooding or coastal erosion.
- g. a power to take enforcement action where there is an obstruction to an ordinary watercourse that may cause a flood risk.

2.2.2.3 The county council as the local highway authority has a duty under the Highways Act 1980 to maintain highways that are maintainable at public expense. This includes responsibility for highway drainage, as well as for the condition and safety for users of all highway assets including roads, footways, bridges and culverts, street lighting and traffic signals.

2.2.2.4 As local highway authority, the county council has a duty to co-operate with other relevant authorities in the exercise of flood risk management functions, which may include the sharing of information with other relevant authorities

2.2.2.4 The county council also has private responsibilities for land drainage where it is a land owner.

2.2.3 City and Borough Councils

2.2.3.1 The flood risk management responsibilities of City and Borough councils include the following:

- a. a power to designate structures and features that affect flooding or coastal erosion;
- b. a duty to exercise their flood risk management functions in a manner consistent with local and national strategies, and to have regard to those strategies in their other functions;



- c. a duty to be subject to scrutiny from democratic processes;
- d. a power to do works on ordinary watercourses;
- e. a duty to co-operate with other relevant authorities in the exercise of flood risk management functions, which may include the sharing of information with other relevant authorities;
- f. a power to take enforcement action where there is an obstruction to an ordinary watercourse that may cause a flood risk.

2.2.3.2 City and Borough Councils have a number of wider functions and roles that can be relevant to flood risk management and response. These include local planning, housing, environmental health and community engagement activity, as well as private responsibilities for land drainage where they are a land owner.

2.2.4 Internal Drainage Board

2.2.4.1 An internal drainage board is a local public authority established in areas of special drainage need in England and Wales. Internal drainage boards have permissive powers to manage water levels within their respective drainage districts. They undertake works to reduce flood risk to people and property and manage water levels to meet local needs.

2.2.4.2 The expenses of an internal drainage board are predominantly funded by the local beneficiaries of the water level management work they provide. Each board sets a budget for its planned work in the forthcoming year and any investments it needs to make for future projects.

2.2.4.3 More information about internal drainage boards can be found from the Association of Drainage Authorities (www.ada.org.uk).

2.2.4.4 The Earby and Salterforth internal drainage board covers part of Lancashire affected by the flooding event to which this report refers. This board has recently entered a collaborative partnership with other boards to access resources and expertise which may be available to contribute to the Section 19 investigation process.

2.2.5 Water Companies

The flood risk management responsibilities of water companies (in Lancashire: United Utilities plc and Yorkshire Water plc) include the following:

- a. a duty as sewage undertakers under Section 94 of the Water Industry Act 1991, to provide & maintain sewers for the drainage of buildings and associated paved areas within property boundaries;
- b. responsibility as sewerage undertakers for lateral drains and public sewers, the latter being defined as a conduit, normally a pipe that is vested in a Water and Sewerage Company, or predecessor, that drains two or more properties and conveys foul, surface water or combined sewage from one point to another point and discharges via a positive outfall;
- c. responsibility for any flooding which is directly caused by its assets – i.e. its water or sewerage pipes;
- d. a duty to be subject to scrutiny from local flood authorities' democratic processes;



- e. a requirement to exercise flood risk management functions in a manner consistent with the national strategy and guidance and have regard to the local strategies and guidance;
- f. a duty to co-operate with other relevant authorities in the exercise of flood risk management functions, which may include the sharing of information with other relevant authorities.

2.3 Civil Contingencies Responsibilities

The flood risk management authorities listed above (with the exception of the internal drainage board) have additional responsibilities under the Civil Contingencies Act 2004, which provides the statutory basis for dealing with a response to flooding in emergency situations. These include flood preparedness planning and flood response.



SECTION 3 – METHODOLOGY - Interpretation of the Section 19 Duty

3.1 This report records the flooding events in Lancashire during the period from Saturday 27 July to Thursday 1 August 2019.

3.2 Although the individual impacts of the weather over these six days were distributed across a large area of the county, the council has interpreted this as one flooding event for the purposes of the Section 19 investigation because of the repeated nature of the weather patterns. Localised site inspections have been carried out by the risk management authorities with differing levels of detail subject to local circumstances.

3.3 Appendix A records the communities affected by flooding during this period, and the nature of the flooding where that can be confidently expressed. It also identifies the risk management authorities with functions relating to each flooding mechanism, any work known to have been done to mitigate the risk of that type of event happening again and identifies any investigations or works for risk management authorities still to complete.

3.4 Appendix B records the individual streets on which various flooding incidents have been reported at the time of publication of this report.

3.5 The individual risk management authorities will be able to provide further details of their specific investigations and any further works arising if required; our Section 19 report does not include these further details.

3.6 Drainage networks interconnect in sometimes complicated ways for historic reasons. Partnership working and joint investigations between the risk management authorities are essential to identify the appropriate options in all communities and to deliver flood risk management improvements.



SECTION 4 – THE WEATHER EVENT

4.1 The Met Office reports that during July 2019, as well as experiencing record high temperatures, the UK experienced several periods of intense rainfall as separate areas of low pressure brought well-above-average rainfall to parts of the country, causing issues particularly for parts of northern England during the last few days of July. Counties in central and northern England (including Lancashire) received more than one-and-a-half times the month's typical rainfall for July. Cheshire received more than twice the average rainfall for the month (219%).

4.2 Specifically for the flooding event under investigation: on Saturday 27 July 2019, heavy rainfall was recorded across Lancashire as indicated by the following Met Office satellite images:

UK satellite and rain-radar precipitation rates at (L) 0000 and (R) 1200 UTC

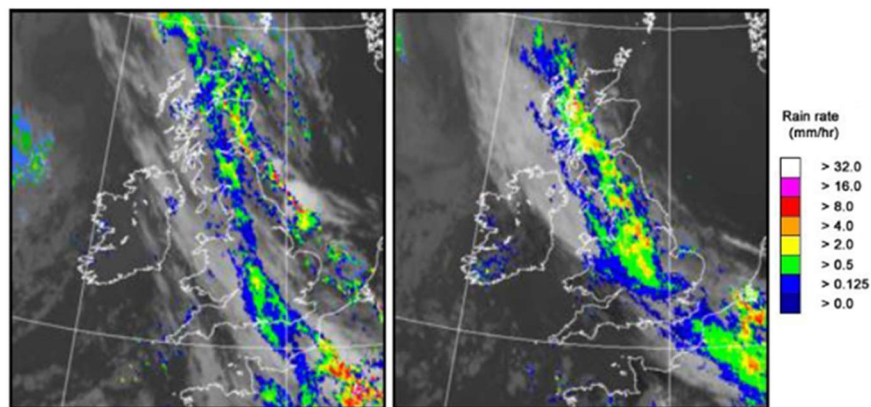


Figure 01 – Satellite images of rainfall Saturday 27 July 2019

4.3 On this day, one property in western Lancashire (Fylde district) was reported to have flooded in heavy rain conditions, and the Met Office issued a yellow warning of heavy rain, expected to impact on Lancashire and elsewhere in the country on Sunday 28 July.

4.4 Then during Sunday 28 July, a slow-moving band of rain affected parts of Northern Ireland, southwest Scotland, northwest England, northeast Wales, the Midlands and East Anglia through the early hours. Much of this rain was heavy and persistent, with low cloud and hill fog in places. Throughout the day the band of rain remained slow-moving with some further heavy rain being reported across the north Midlands, northern England, southern Scotland and Northern Ireland. A few thunderstorms also developed, as illustrated by further satellite images from Met Office records at Figure 02 below.

4.5 25 properties were reported as having flooded on Sunday 28 July. Whilst 4 of these were in western Lancashire (Fylde, Chorley and Preston districts), the remainder were in eastern districts (1 in Pendle and 20 in Rossendale). Of the Rossendale properties, all were in the town of Whitworth, at the south-easterly extent of Lancashire and close to Rochdale.

UK satellite and rain-radar precipitation rates at (L) 0000 and (R) 1200 UTC

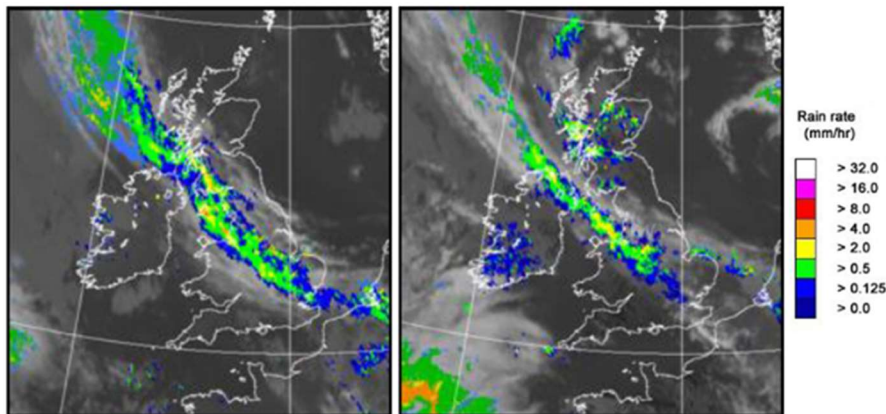


Figure 02 – Satellite images of rainfall Sunday 28 July 2019

4.6 The Met Office table in Figure 03 below identifies that on this day, Rochdale recorded the highest rainfall in the country. Although we don't have access to any rain gauges in Whitworth, we believe it reasonable to assume that Whitworth was impacted by the same heavy rainfall as Rochdale, which is only 2-3 miles away.

Daily Extremes

Highest Maximum	25.7°C Achfary (Sutherland, 46mAMSL)
Lowest Maximum	13.2°C Altnahinch Filters (Antrim, 213mAMSL)
Highest Minimum	17.1°C Cromer (Norfolk, 37mAMSL)
Lowest Minimum	7.0°C Castlereagh (Down, 122mAMSL)
Lowest Grass Minimum	2.2°C Scolton Country Park (Dyfed, 75mAMSL)
Most Rainfall	67.4mm Rochdale (Greater Manchester, 110mAMSL)
Most Sunshine	14.6hr Lerwick (Shetland, 82mAMSL)
Highest Gust	40Kt 46mph Capel Curig No 3 (Gwynedd, 216mAMSL)
Highest Gust (mountain)	66Kt 76mph Cairngorm Summit (Inverness-shire, 1237mAMSL)
Greatest Snow Depth at 0900 UTC	No non-zero values

mAMSL refers to station elevation in metres above mean sea level

Figure 03 – Daily extremes Sunday 28 July 2019

4.7 Further properties reported that they had flooded on 29 July 2019 as follows:

- Chorley – 3 properties
- Fylde – 1 property
- Hyndburn – 3 properties
- Rossendale – 8 properties (7 in Whitworth)
- South Ribble – 2 properties
- West Lancashire – 3 properties
- Wyre – 1 property

Heavy showers were experienced early in the day across northwest England, although these eased away southwards, as indicated by the satellite images in Figure 04 below:

UK satellite and rain-radar precipitation rates at (L) 0000 and (R) 1200 UTC

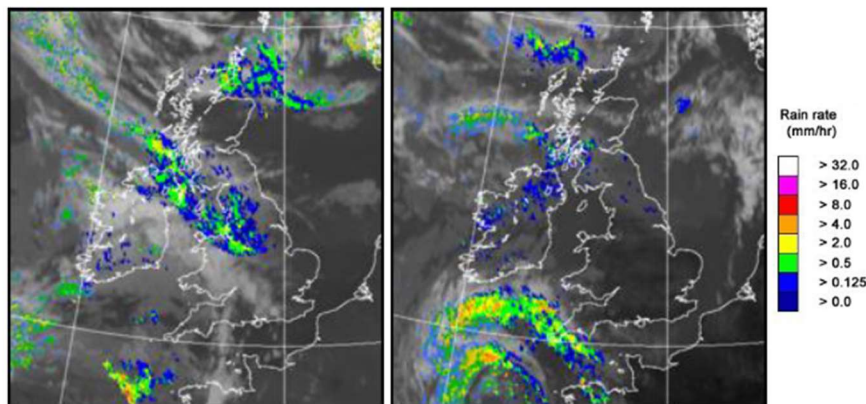


Figure 04 – Satellite images of rainfall Monday 29 July 2019

4.8 There was blustery weather during Tuesday 30 and Wednesday 31 July 2019, with occasional bands of heavy showers across northern England in general and Lancashire in particular. These caused further flooding across the county as follows:

- Burnley – 2 properties
- Chorley – 5 properties
- Fylde – 2 properties
- Pendle – 4 properties
- Preston – 2 properties
- Ribble Valley – 2 properties
- Rossendale – 3 properties (all in Whitworth)
- South Ribble – 1 property
- West Lancashire – 10 properties
- Wyre – 3 properties

4.9 During the early hours of Thursday 1 August 2019, the showers eased leaving the UK largely dry with lengthy clear spells. Remaining cloud broke up to give some warm spell of sunshine for many during the day but from late morning this sparked a few showers. These showers developed further during the afternoon, especially across western, central and southern Scotland and well as northwest England, the Midlands and East Anglia. In places these became rather heavy with thunder across Scotland and northwest England. The showers began to ease through the evening leaving a largely dry and fine end to the day.

4.10 This additional rainfall caused external flooding to further properties in Lancashire as follows:

- Chorley – 5 properties
- Hyndburn – 1 property
- Preston – 1 property
- Ribble Valley – 2 properties
- Rossendale – 1 property
- West Lancashire – 10 properties

SECTION 5 – RESPONSE TO THE FLOODING

5.1 Over the period 27 July to 1 August 2019, there were multiple reports of storm and flood problems impacting on safe travel around much of Lancashire's local road network including a tree blown across the road in Barrowford and standing water on main roads and residential roads (see example from Preston at Figure 05 below). All incidents were responded to either during working hours by the county council's normal Highway Service resourcing, or out of hours by the Highways emergency responder teams.



Figure 05 – Riversway, Preston (28 July 2019)

5.2 Shortly after 1200hrs on 28 July 2019, Lancashire Police reported various incidents, including a warning for the public to be aware that the Environment Agency had issued a flood warning in Whitworth, with properties affected in areas around Station Road, Millfold, John Street, Daniel Street, and the football ground.



Figure 06 – John Street, Whitworth (28 July 2019)

5.3 Lancashire Resilience Forum records of Sunday 28 July 2019 identify that a rest centre was opened in Whitworth after 8 properties flooded, for any residents needing

respite from storm/flooding problems at home. However, no-one used the facilities, and the rest centre was later closed.

5.4 Heavy rain also led to delays at the Senior Open Championship at Royal Lytham and St Annes Golf Club in Lancashire on the same day.

5.5 Starting the following morning as flood waters died away, the county council's Highway Service began to attend every highway location reported or known to have been affected by flooding, to inspect conditions and to remove silt from gullies and drainage systems. United Utilities plc and Yorkshire Water plc carried out equivalent exercises for the public sewer network.

5.6 This response continued through the week as repeated bands of heavy rain impacted on Lancashire.

5.7 In some locations, these inspections found that the local urban drainage networks had been obstructed by debris washed in during the rainstorm. In other locations, longer-running capacity reductions were found relating to ingress of tree roots, which had slowed the flow of surface water run-off by trapping silt and other small debris.

5.8 Appendix A to this report records the various experiences in different communities affected by flooding during this rainfall event. It identifies the following information:

- District Council area;
- Settlement/locality where flooding was reported;
- Number of properties known to be affected by flooding;
- Our assessment of the primary flooding mechanism/s in that locality;
- Which flood risk management authorities have had a role in managing the flood risks identified;
- What has been done as a consequence of receiving the flooding reports from local people, and/or what more is required at the date of publication.

5.9 Appendix B records the names of the streets reported to the county council, where property is known to have flooded during this event. Whilst the greatest concern will always be for residential properties affected by flooding, it is good practice to record all types of property flooded including homes, gardens/outbuildings, community assets/public highways and other private property including schools, offices and business-premises.

5.10 Because many incidents of standing water on the public highway and disappeared quickly following the end of each rainfall event and/or where Highways officers had attended to remove local obstructions to the highway drainage network, in this Section 19 investigation we have only taken account of highway flooding where it directly relates to the reports we received of flooding to homes and gardens.

SECTION 6 – NEXT STEPS

6.1 Where appropriate, the flood risk management authorities' options for further action are identified in Appendix A as part of our report into the way they each responded to this flooding event.

6.2 Shortly after the event, there were suggestions made locally that alterations in the highway network of the Wallbank Estate in Whitworth, such as raised kerbs in selected locations, could be made to disperse heavy flows of surface water and to reduce the impact of such flows moving in a straight line through roads and ginnels. This work was carried out later in the year in a number of vulnerable locations around the estate.

6.3 A number of the affected homes in Whitworth are owned and managed by one of the local housing associations, Together Housing. Staff of this organisation have demonstrated their willingness to learn from the flooding event and to consider making relevant adaptations to their more vulnerable properties to reduce the risk of future damage from ingressing flood water.

6.4 There are other achievable and sustainable responses available for communities seeking improved protection from similar rainfall events should these occur in the future. Depending on particular local circumstances, sustainable activity might include any combination of the following suggestions:

- Improved drainage system maintenance regimes including better-targeting of maintenance activities;
- Increased areas of absorbent land within urbanised streets (for example more trees and shrubs, increased unpaved areas in highways, gardens, drives & yards);
- Increased absorbency of open land outside of built-up areas to slow the rate at which heavy rainfall flows off the land (tree planting, peat restoration, terracing of fields, cattlegrids);
- Localised temporary road closures to reduce bow waves washing off streets onto private property;
- Improved protection against water-ingress at vulnerable properties;
- Improved 'warning and informing'-type communications to trigger appropriate local action, deployment of temporary defences etc.

6.5 Measures of these types can be very effective at managing the peaks of an intense rainstorm, and at giving local people more control over the way they are affected in such weather conditions. All the risk management authorities are ready and willing to work with local community groups and Town/Parish Councils to identify and introduce measures appropriate for their local circumstances.

6.6 The Risk Management Authorities have particularly appreciated the opportunities for very detailed conversations and investigations with interested and affected people in Whitworth, through the work of the Whitworth Flood Action Group. This Group has continued to meet since the 2019 flooding incident and provides a very valuable

addition of local knowledge to the practical flood risk activities of the drainage authorities.

6.7 Any individuals who want to consider what they might do for themselves will find practical and realistic suggestions on the dedicated North West Flood Hub (thefloodhub.co.uk).

6.8 Working with communities and working in partnership are key recommendations of the emerging national flood risk management strategy. Lancashire's flood risk management authorities are all committed to finding better ways to make our offers more widely known about, and to helping people to access our teams for advice.



SECTION 7 – SUMMARY AND CONCLUSIONS

7.1 The rainfall events in Lancashire that lasted from 27 July to 1 August 2019 were extreme enough in some locations of Lancashire to overwhelm many drainage networks. Whilst it was not the most damaging event in recent years, affected people were extremely concerned for their own safety and for the damage that occurred to their homes and belongings.

7.2 During the affected period, 103 individual homes and business premises were flooded across Lancashire, where rain fell faster than it could be collected and dispersed by local urban drainage networks.

7.3 The most significantly-affected location was Whitworth in Rossendale, where rainfall on Sunday 28 July 2019 caused particularly devastating damage by running directly off open fields and moorland, before being funnelled into a deep flow by the layout of local estate roads and footpaths.

7.4 Given that flood risk will always be present in a large county area such as Lancashire, it is important that the county council, as lead local flood authority, records the experiences arising from all notable flood events, ensuring they are captured and used alongside technical information to identify and deliver improvements and advice to affected people.

7.5 Our investigations find that it would be unrealistic for anyone to expect a substantial investment in the near future to increase the capacity of their local highway drainage systems, as there is currently no investment targeted at such works and no plans to start new programmes of that type. However the public sewer networks are now receiving attention (for environmental protection reasons as well as for flood risk management purposes), and we expect a number of projects to progress and provide improved resilience to heavy rain fall events of this nature in the future.

7.6 We advise that it is also realistic to look into better ways of managing flood risk within community areas, enabling local people to have more control of the way their homes and localities might be best protected through an intense rainfall event and then might recover most swiftly afterwards.

7.7 Such work is mostly delivered during the day-to-day activities of the risk management authorities, and progress on local initiatives is shared with local communities through existing communication channels. This work and the wider responsibilities of the county as lead local flood authority are overseen by the Lancashire Strategic Partnership and, more widely, by the Regional Flood and Coastal Committee.



7.8 It is hoped that the suggestions made in this report will be developed locally to improve the flood resilience of the affected areas. From the experiences during and after this flood incident, the county council together with partner organisations are developing an improved understanding of the way our incident response, community engagement and data collection activities are interlinked. This is informing our development of improved procedures to respond to future flooding events to further improve the flood knowledge and response in the county.

