



**ST HELENS**  
BOROUGH COUNCIL

## St Helens Borough Section 19 Report: Billinge

Section 19 Flood Investigation Report of Incident on 8<sup>th</sup> December 2021

Report Reference LLFA/S19/2021/01

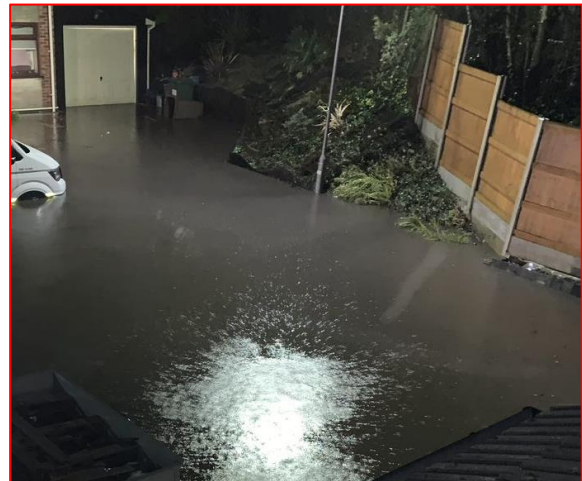


Image Sources: Resident



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## 1. Introduction

### 1.1 Purpose

This document has been prepared by St Helens Borough Council, as the Lead Local Flood Authority (LLFA), for the specific purpose of meeting the requirements of Section 19 (1) and (2) of the Flood and Water Management Act (FWMA) 2010 which states:

*(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.*

The findings of this report are based on a subjective assessment of the information available and provided to the LLFA from 3<sup>rd</sup> parties and other Risk Management Authorities (RMA). The opinions, conclusions, and any recommendations in this report are based on conditions encountered and information reviewed at the time of preparation. The Council expressly disclaims responsibility for any error in, or omission from, this report arising from or in connection with those opinions, conclusions, and any recommendations.

This report aims to meet the requirements of Section 19 of the FWMA, as well as provide a reference for the effective future management of flooding in the administrative area of St Helens through:

- Providing details of the flooding incident(s);
- Undertaking analysis of the flood history of the area;
- Identifying the actions which were carried out and by whom;
- Identifying the responsibilities of RMAs;
- Identifying successful response measures and lessons learned; and
- Recommending the next steps.

Any updates to the investigation criteria can be found in the Councils Lead Local Flood Risk Management Strategy (LLFRMS).



## 1.2 Criteria

St Helens Borough Council, in accordance with the LLFRMS, will undertake a post incident review to identify the sources which contributed to triggering Section 19 (1) of the FWMA. A flood event with significant consequences, which triggers the Council's threshold to undertake a Section 19 Flood Investigation, is one that has had or could have had, if action had not been taken, one or more of the following impacts in *Table 1*.

<b>St Helens Council threshold for Section 19 Investigations</b>	<b>Criteria Met</b>
Resulted in major disruption to the flow of traffic for 12 hours or more	No
Posed, or could have posed, a risk to human health	Yes
Adversely affected the functioning of critical infrastructure	No
Caused harmful impacts to environmentally and socially important assets	No
Caused internal flooding to a property used for residential or commercial purposes	Yes

*Table 1: Thresholds to Trigger a Section 19 Flood Investigation*

Section 19 (2) requires that the LLFA publishes the results of its investigation and notifies the relevant RMAs accordingly. Timescales for investigations are subject to the scale and complexity of incidents being investigated.

## 1.3 Flood Incident

The flooding incident that occurred in Billinge on 8<sup>th</sup> December 2021 is considered to have satisfied the threshold for a formal investigation in accordance with Section 19 of the FWMA.

## 2. Weather Conditions

### 2.1 Overview

During November and December 2021 there were no named storm events within England. According to the Environment Agency (EA) monthly water situation report for December 2021, the rainfall totals across England were around average for that time of year. However, the north-west of England received above average rainfall in comparison to the majority of catchments in England. Across England, river flows increased at many of the indicator sites reported on by the EA, with the greater part classed as being normal or higher for this period of the year. Additionally, for the majority of the EAs indicator sites, groundwater levels were classified as normal or higher for the time of year.

According to the December 2021 EA monthly water situation report, the December rainfall total for England was 89mm, which represents 104% of the long-term average. The EA report states that some of the highest monthly totals were seen in the north-west of England, where the St Helens borough is situated, demonstrated by Figure 1.<sup>1</sup>

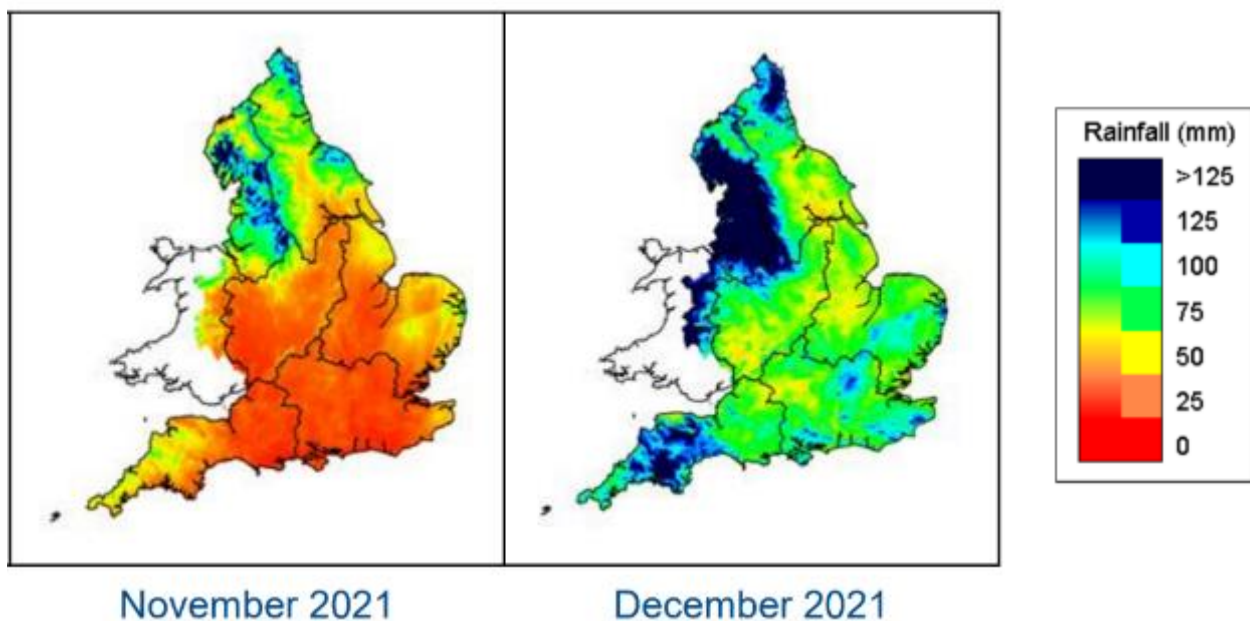
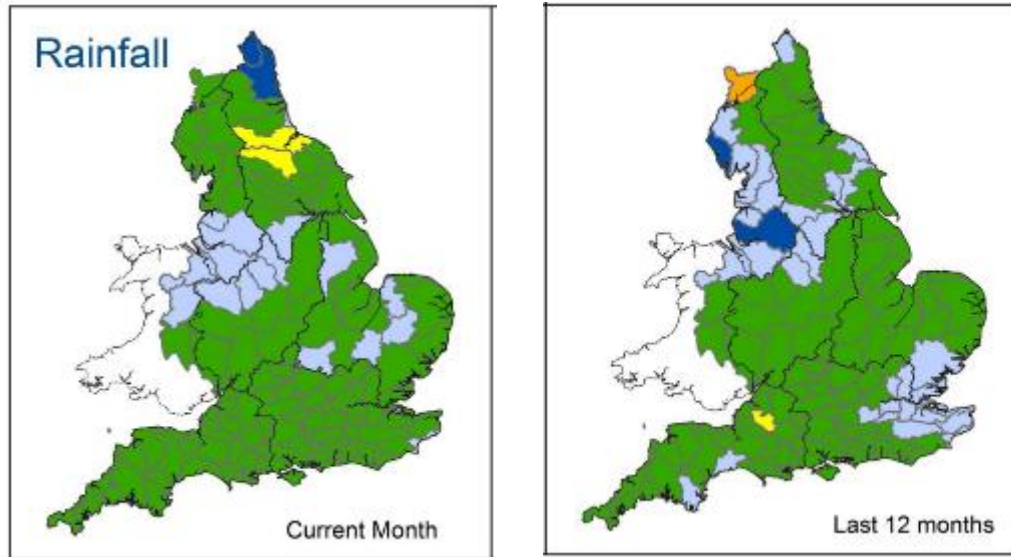


Figure 1: Monthly rainfall across England and Wales for the November & December 2021

<sup>1</sup> UKPP radar data (Source: Met Office © Crown Copyright, 2021). Note: Radar beam blockages in some regions may give anomalous totals in some areas. Crown copyright. All rights reserved. Environment Agency, 100024198, 2021.

The December monthly average for the north-west region was shown in the EA report as being above normal and the yearly average for 2021 was consistently in the notably high bracket, see *Figure 2*.<sup>2</sup>



*Figure 2: Total rainfall for the hydrological areas across England which show St Helens was above normal for December 2021 and notably high for the 12-month period*

## 2.2 Flood Warning and Alerts

The Met Office has a statutory duty to provide forecast information for the public, relevant Government agencies, such as the EA, and the water companies. Legislation supporting the Civil Contingencies Act (2004) states that Category 1 responders must have regard to the Met Office's duty to warn the public, and provide information and advice, if an emergency is likely to occur or has taken place.

The EA use a three-tiered approach to Flood Warnings and Alerts depending on the severity of flooding expected, please see *Table 2*. These are issued at different intervals in advance of flooding. Flood Alert Areas generally cover a large area and mean flooding of low-lying land and roads is possible, whilst Flood Warning Areas are usually more detailed and broken down into specific locations and mean flooding to properties is expected. Locations within a Flood Alert Area are also not necessarily within a Flood Warning Area.

Sections of the St Helens boundary are covered by the EAs Flood Warning Service and Flood Alert Areas. The Flood Warning Area is applicable to all main rivers. Flood Alert Areas are applicable to all main rivers and some adjacent discrete watercourses. The full list of all areas covered by the flood warning service are shown in the Council's LLFRMS.

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<sup>2</sup> HadUK data based on the Met Office 1km gridded rainfall dataset derived from rain gauges (Source: Met Office © Crown Copyright, 2021). Provisional data based on Environment Agency 1km gridded rainfall dataset derived from Environment Agency intensity rain gauges. Crown copyright. All rights reserved. Environment Agency, 100024198, 2021



Section 19 Flood Investigation Report

Warning Alerts:	Description:	When Actioned:
 FLOOD ALERT	Flooding is possible. Be prepared.	Two hours to two days in advance of flooding.
 FLOOD WARNING	Flooding is expected. Immediate action required.	Half an hour to 2 hours in advance of flooding.
 SEVERE FLOOD WARNING	Severe flooding. Danger to life.	When flooding poses a significant threat to life.

Table 2: Met Office Flood Warning Alerts

No individual Flood Warnings within St Helens were enacted on this date. However, a Flood Alert for the generalised Sankey Catchment area was issued. Details on the issued Flood Alert can be seen in *Table 3*.

Type	Date / Time Issued	Code	Name
Flood Alert	08/12/2021 21:15	013WAFSA	River Sankey catchment within St Helens and Warrington

Table 3: Flood Alerts / Flood Warnings Issued



### 3. Sources of Flood Risk

Table 4 identifies the different sources of flooding. A flood event can be the result of one source of flooding, or a combination of sources.

Source	Description
Fluvial flooding	Exceedance of the flow capacity of river channels (whether this is a Main River or an Ordinary Watercourse), leading to overtopping of riverbanks and the inundation of the surrounding land.
Tidal flooding	Propagation of high tides and storm surges up tidal river channels, leading to overtopping of the riverbanks and inundation of the surrounding land.
Surface Water flooding (Pluvial flooding)	Intense rainfall exceeds the available infiltration capacity, and/or the drainage capacity, leading to overland flows and surface water flooding.
Groundwater flooding	Emergence of groundwater at the surface (and subsequent overland flows), or into subsurface voids, as a result of abnormally high groundwater flows. The introduction of an obstruction to groundwater flow and/or the rebound of previously depressed groundwater levels.
Sewer flooding	Flooding from sewers is caused by exceedance of sewer capacity and/or a blockage in the sewer network. In areas with a combined sewer network system there is a risk that land and infrastructure could be flooded with contaminated water.
Other sources of flood risk	Flooding from canals, reservoirs (breach or overtopping) and failure of flood defences.

Table 4: Various Sources of Flooding

#### 3.1 Environment Agency Flood Maps

The EA provide flood risk maps<sup>3</sup> that can be used to assess the likelihood of flooding in certain areas in the UK. These maps provide information on potential surface water (see Figure 3), river and sea, and reservoir vulnerability to flood risk. It evaluates the risks, removing any potential flood defences and is used to help vulnerable communities understand and be aware of the hazards.

The affected area in Billinge is classified as Flood Zone 1 on the EA Flood Map for Planning, which indicates that there is low risk from main river flooding in the area. It is worth noting that this is a general classification for the wider area and, therefore, is not specific to the affected area.

Whilst the management of surface water falls under the scope of St Helens Borough Council as the LLFA, the EA produced the national Updated Flood Map for Surface Water in its Strategic Overview role in flood risk management. This mapping has been designed to indicate areas that may be at risk of surface water flooding for:

- 30-year (high risk),
- 100-year (medium risk),
- 1000-year (low risk).

<sup>3</sup> [Check the long term flood risk for an area in England - GOV.UK \(www.gov.uk\)](http://www.gov.uk)



The EA surface water flood risk map (see *Figure 3*) shows that Brownheath Avenue, the area to its rear and, Powell Drive may be affected by surface water flooding. The level of risk does differ across the area, with the area to the rear of the properties and the eastern side of the two effected streets, having the highest risk. The risk of flooding indicated in the EA surface water mapping is indicative of low-lying areas or localised depressions in topography. The risk on both streets appears to vary between low and medium risk. The map also shows that surface water flooding has the potential to travel in between the properties, even within the low-risk category.



*Figure 3: EA's Surface Water Flood Map – Billinge, St Helens*

The river and sea EA Flood Risk Map does not show any risk of fluvial or tidal flooding in the area. It must be noted that the EA maps relate to main river flooding, and not ordinary watercourse, as the EA Flood Map for Planning does not show the risk of flooding from watercourses with a catchment area of less than 3km<sup>2</sup>. The flooding in this location relates to ordinary watercourses rather than main river flooding.

The EA Reservoir Risk Map demonstrate that the affected area of Billinge is not at risk from flooding from reservoirs.

## 4. Local Risk Management

### 4.1 Overview

On-duty officers were made aware of the situation early in terms of the event timescale. However, the LLFA were not made aware of the flooding event until after the floodwaters had receded. St Helens Borough Council provided sandbags and, where necessary, offered temporary accommodation to the affected property residents. It is worth noting that the response was undertaken during the winter maintenance period in which staff and vehicles resources were already allocated.

On 8 December 2021, the day of the flood event, there were no storm events. A general, catchment-wide, flood alert was issued by the EA for the Sankey Catchment area but this was implemented after the flooding at Billinge had already occurred. This is unsurprising, as the alert was for the Sankey Catchment as a whole, thus it was not specific to Billinge and the affected area.

As noted, two streets were affected during this event, Brownheath Avenue and Powell Drive, located in the Billinge area of St Helens (*Figure 4*). Billinge is located in the north of the St Helens borough, close to Wigan.

As a result of the event, properties were flooded both internally and externally on both of the residential streets. The number of properties affected were:

- Brownheath Avenue - 4 properties affected internally and externally, and 12 further properties affected externally, and
- Powell Drive – 4 properties affected internally and externally, and 1 property was affected externally.

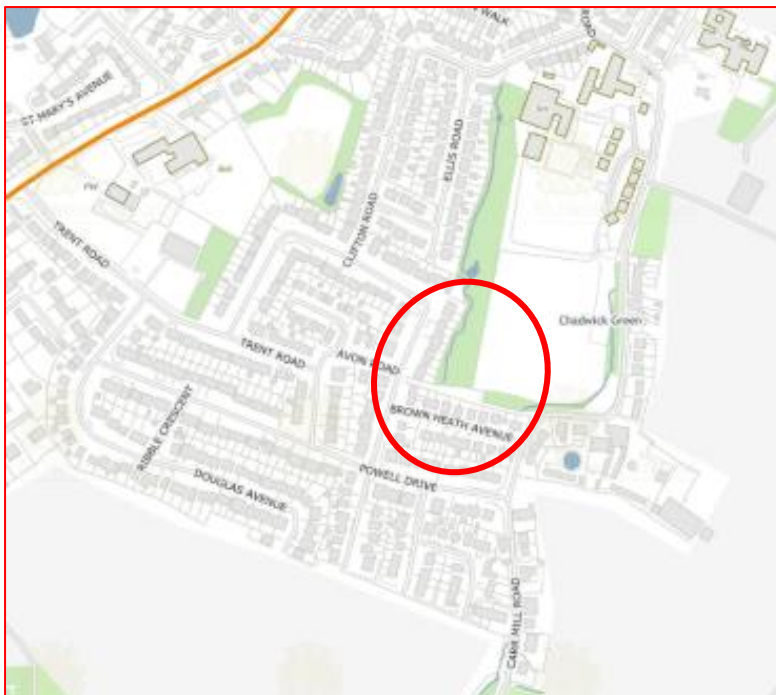


Figure 4: Location of Flood Event

Since the LLFAs formation, there have been no formally recorded instances of internal flooding on Brownheath Avenue and Powell Drive, although, external flooding of the highway has been known to occur. Anecdotal information from the residents, report that historically the culverts to the rear of Brownheath Avenue have overtopped and the floodwaters have reached the property boundaries.

Upon studying historic maps, a historic pond was identified to have been in the area where the affected houses are now situated. This indicates that this area has always been a potential low spot for the settling of water. *Figure 5* highlights the location of this historic pond.<sup>4</sup>



*Figure 5: Historical Map of the Affected Area*

The Statutory Sewer Map was obtained from UU and shows the sewer network in the general area of the flood event (*Figure 6*). The area is drained via surface water and combined sewer networks. The UU Surface Water network connects to a culverted watercourse, which is the main drainage point for one of the affected watercourses during the event. The watercourse, which is located to the west, mainly holds water discharged from the UU network which then reconnects to drain into the UU Surface Water sewer network, just north of Brownheath Avenue. As shown on *Figure 6*, most of the network flows from north to south, following the topography of the area. There are several UU outfalls that discharge into the watercourses, upstream and downstream of the flooding location.<sup>5</sup>

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<sup>5</sup> Crown copyright and database rights. The Ordnance survey 100022432. This plan is based on the Ordnance Survey Map with the sanction of the Controller of H.M. Stationary Office. Crown and United Utilities Water copyrights are reserved. Unauthorised reproduction will infringe these copyrights. 05/12/2022



Figure 6: UU Statutory Sewer Map

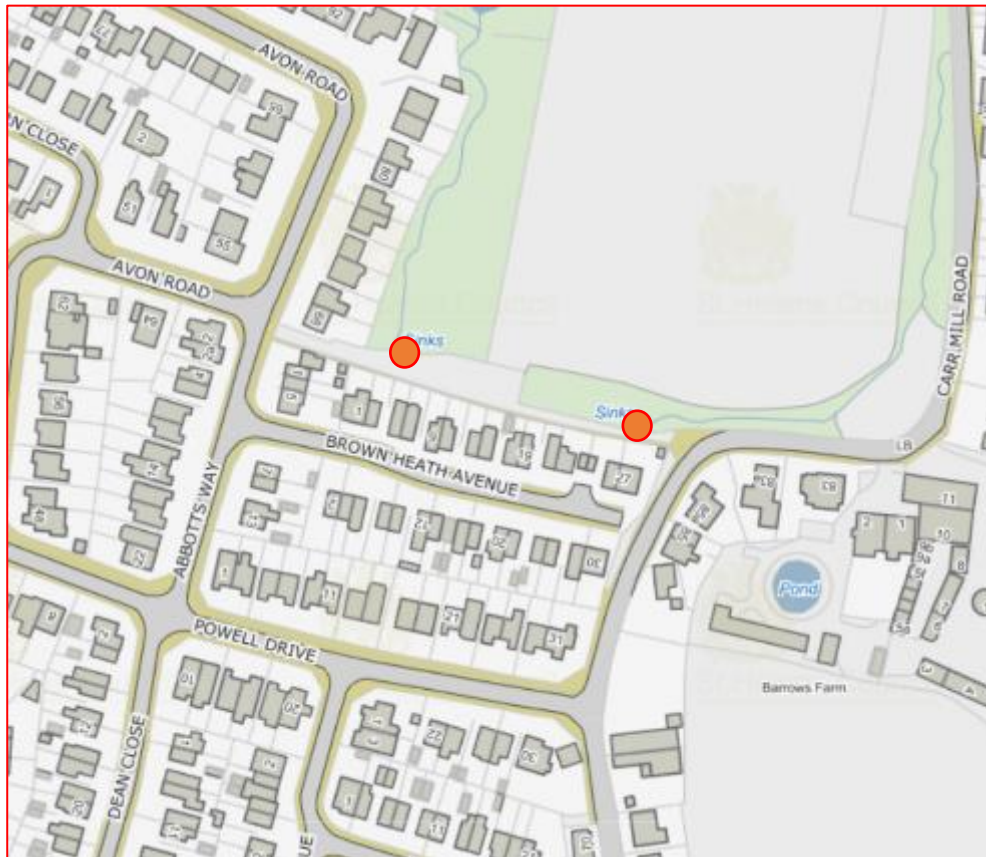
## 4.2 Response

In the afternoon of the flooding event, Merseyside Fire and Rescue Service (MFRS) were called out to assist the affected residents. Anecdotal information and the MFRS incident reports show that MFRS was trying to locate the drainage network and the source of flooding to pump the water away. MFRS identified the ordinary watercourse running alongside Carr Mill Road, where light portable pumps were used to pump out water. A local, off-duty fireman then informed the MFRS about the potentially blocked culverts. Once the culverts were located and accessed, the debris causing a blockage was cleared from the culvert inlets by MFRS. The debris is believed to have been compiled of natural vegetation, silt, and litter. According to the witnesses and the MFRS's incident report, the water levels receded and began to flow normally within the culvert after the debris removal was undertaken.

It was not until the floodwater has receded, and MFRS had moved on from the scene that the LLFA was made aware of the situation.

## 5. Flood Mechanism and Conclusion

There are two watercourses in this section of Billinge that drain two separate areas, each with a different inlet point. Both culvert inlet points are accessed via privately owned land, see *Figure 7* for the inlet locations. <sup>6</sup>



*Figure 7: Culvert Inlets*

The anecdotal overview begins with the rainfall during November and December 2021 that, subsequently, led to flooding from the open watercourses, located to the north of Brownheath Avenue. The LLFA was not able to see this on the day but through the investigation of the anecdotal information provided by adjacent landowners and the MFRS incident reports, this seemed to be the general consensus.

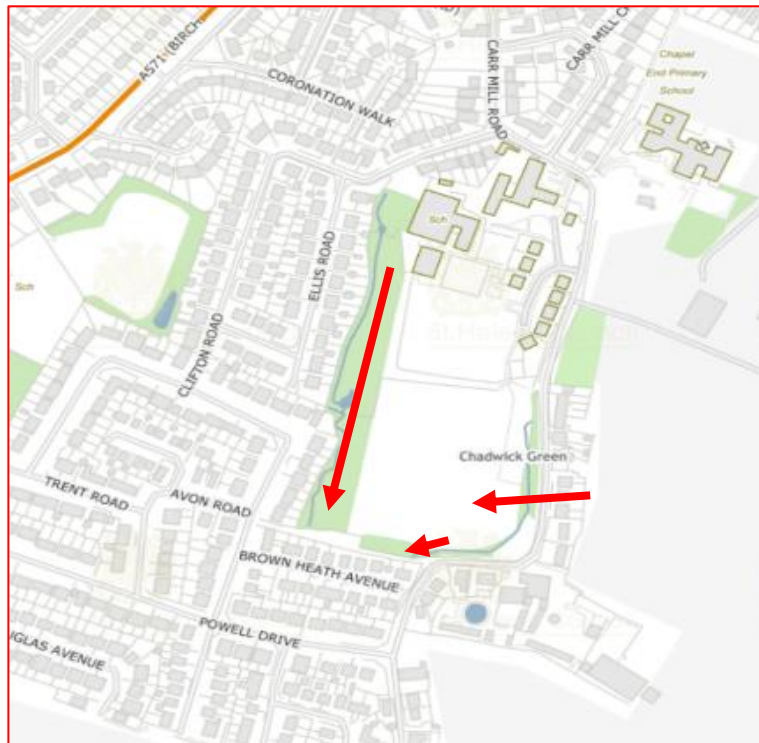
From discussions with the residents and in the MFRS incident reports, the blockage of the culvert inlets is believed to be one of the major contributing factors to the flood event, along with the high rainfall experienced by the area's drainage network. According to the anecdotal information, the blockage material comprised mainly of silt build-up, loose vegetation and, fly tipping materials. This blockage then resulted in the overtopping of the watercourses.

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The floodwaters travelled southwards towards the public right of way, located to the rear of Brownheath, and then onto the Brownheath Avenue properties, following the natural topography of the area. Then the floodwaters migrated into the Brownheath Avenue adopted highway, where the volume of water was not able to drain away quick enough via the highway drainage network. The water depth, at its deepest, was between 2 to 3 feet deep in the roadway. The floodwaters moved southwards toward Powell Drive which in turn, knocked down the fences dividing Brownheath Avenue and Powell Drive. This created a wave of floodwater that moved toward the properties on Powell Drive and resulted in the internal flooding of the affected properties located on Powell Drive. The floodwater then drained back into the watercourse when it reached the adopted highway drainage network on Powell Drive and the connecting highway. Once the culverts were cleared of debris by the MFRS, it was reported that the the watercourse ceased to overtop which allowed the drainage network on Brownheath Avenue and Powell Drive to drain the existing floodwaters.

Furthermore, residents also reported that field drainage from the land to the north-east of the affected area, added to overall volume of floodwater. *Figure 8* shows the believed general routes taken by the floodwater on the day of the flood event.<sup>7</sup>



*Figure 8: General Flood Mechanism for the Flood Event*

This series of events, which has been concluded based off the information provided from 3<sup>rd</sup> parties and other RMAs, is what is thought to have happened on the day of the event. The following section will outline the general pathway to move forward from the event.

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## 6. Recommended Actions

Following the Billinge flood event, properties were internally and externally flooded on Brownheath Avenue and Powell Drive. The LLFAs role is to coordinate the management of flood risk within their administrative area. It is suggested that the recommendations made within this report are considered by the relevant RMAs and reviewed on a regular basis. St Helens Borough Council will consider the following actions as per the flooding incident, as shown in *Table 5*.

<b>ID</b>	<b>Action</b>	<b>Lead RMA (Support)</b>
1	Confirm land ownerships within the area.	St Helens Council
2	Arrange meetings with riparian landowners.	St Helens Council
3	Confirm appropriate maintenance roles and responsibilities.	St Helens Council
4	Confirm drainage catchment in the area and discuss with RMAs.	St Helens Council, UU
5	Investigate watercourse networks within the area.	St Helens Council, UU
6	Undertake discussions to review and strengthen emergency planning procedures.	St Helens Council
7	Potentially undertake flood study – identify mitigation measures, if possible.	St Helens Council, Landowner
8	Support the landowner to make the appropriate upgrades to the culvert screens and to conduct their maintenance.	St Helens Council, Landowner
9	Monitor flooding in the area.	St Helens Council, Landowner

*Table 5: Actions to be Undertaken*