

Flood Investigation Report Sessay



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Records of the public sewer system included are a facsimile of the statutory record provided by Yorkshire Water Services Ltd. For the purposes of this report minor sewers and other non-relevant data have been omitted from the plans for clarity.

Purpose

This document has been prepared specifically for the purpose of meeting the requirements of Section 19 of the Flood and Water Management Act 2010.

The purpose of this report is to investigate which Risk Management Authorities (RMAs) had relevant flood risk management functions during the flooding incident, and whether the relevant RMAs have exercised, or propose to exercise, their risk management functions (as per Section 19 (1) of the Flood and Water Management Act 2010). It does not address wider issues beyond that remit, nor include recommendations for future actions.

The supporting data has been put together based on records of internal property flooding and road closure information from a variety of sources. While every effort has been made to verify the locations of the Section 19s identified, the nature of the data and the methods used to collate this information mean that it does not include every occurrence of flooding. This data only identifies where flooding has been reported and is indicative only.

Acknowledgements

Mouchel would like to thank the following for their cooperation and assistance in this investigation:

North Yorkshire County Council Flood Risk Management Team

North Yorkshire County Council Highways Department

North Yorkshire County Council Emergency Planning Unit

The Environment Agency

Yorkshire Water Services Ltd

Sessay Parish Council

Hambleton District Council

Date of Site Inspection: Tuesday 13th September 2016

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1 Executive Summary

The intensity of rainfall leading up to and during the 26th of December 2015 caused a significant flooding event to occur in the village of Sessay.

Widespread and substantial rainfall had fallen over West and North Yorkshire in late December 2015. In this event, rainfall in the middle reaches of the catchment was proportionately more significant than over the Pennines and this pattern of rainfall had particular consequences for communities, both in terms of the scale of flooding and the lead times available for issuing warnings.

It had already been very wet for an extended period of time with data showing the wettest ever rankings for November 2015. In addition the ground was already saturated from rainfall in November, prior to the exceptionally wet December 2015.

The rainfall event that occurred between the 23rd and the 26th December 2015 was characterised by two distinct rainfall systems. The second pulse of rainfall on Boxing Day 2015 fell on ground that was already saturated. As the ground was unable to absorb any of this rainfall, water flowed towards the village.

Runoff from the agricultural land overwhelmed highway drainage systems, and combined with highway surface water runoff, flowing into driveways and down Old Cricket Field Lane. The surface water then flowed towards and proceeded to enter the properties on Old Cricket Field Lane and Sessay Garth.

The flooding mechanisms during the event were therefore:

- Significant surface water runoff from agricultural land above the village as a result of the high rainfall events.
- Overwhelmed highway drainage systems caused by surface water runoff as a result of the heavy rainfall events.

The capacity of the pumping station in Sessay was exceeded due to surface water inundation of the foul sewer. Yorkshire Water Services Ltd removed sewage by tanker from the pumping station to maintain service.

This report has identified the actions and responses of the Risk Management Authorities who have responsibilities during a flood event in Sessay. It is understood that all Risk Management Authorities have undertaken appropriate activities in response to the flood event, in line with their duties and responsibilities under the Flood and Water Management (2010) Act.

2 Introduction

2.1 Flood and Water Management Act (2010)

In his review of the summer 2007 floods, Sir Michael Pitt recommended that local authorities should be given a duty to investigate flooding.

The Flood and Water Management Act 2010 (FWMA), defines the roles and responsibilities of 'Risk Management Authorities' and designates the unitary or upper tier authority for an area as Lead Local Flood Authority (LLFA).

The LLFA has responsibility for leading and co-ordinating local flood risk management. Local flood risk is defined as the risk of flooding from surface water runoff, groundwater and small ditches and watercourses (collectively known as ordinary watercourses). The responsibility to lead and co-ordinate the management of tidal and fluvial flood risk remains that of the Environment Agency (EA).

The Act also implements the recommendations made by Sir Michael Pitt that local authorities should have a duty to investigate flooding from all sources.

2.2 Section 19 Investigation Requirement

North Yorkshire County Council (NYCC), as LLFA, has a responsibility under Section 19 of the FWMA to investigate significant flood incidents in its area. Section 19 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.

Section 14 of the FWMA grants the LLFA power to request information associated with its functions. These powers have been exercised in the preparation of this report.

2.3 Trigger for Section 19 Report

The incident has been assessed in line with the criteria set out in Section 3 of the North Yorkshire County Council Local Flood Risk Strategy (2015) and has been judged to warrant a formal Section 19 investigation on the basis of:

- Number of properties internally flooded.
- The depth, area or velocity of flooding reported.
- The frequency of flooding.
- The nature and extent of critical infrastructure impacted by the flood.

2.4 Location

Sessay is a small village situated in the Hambleton district of the county of North Yorkshire. Sessay predominantly consists of residential properties. Sessay (Grid Reference: SE 45803 75472) is located 2.5km west of the A19, 5.5km east of Topcliffe, and 7km south of Thirsk, as shown in Figure 2.1. The 2011 Census Profile confirmed Sessay had a population of 424. The village is in a linear form extending over a length of 1.5km.

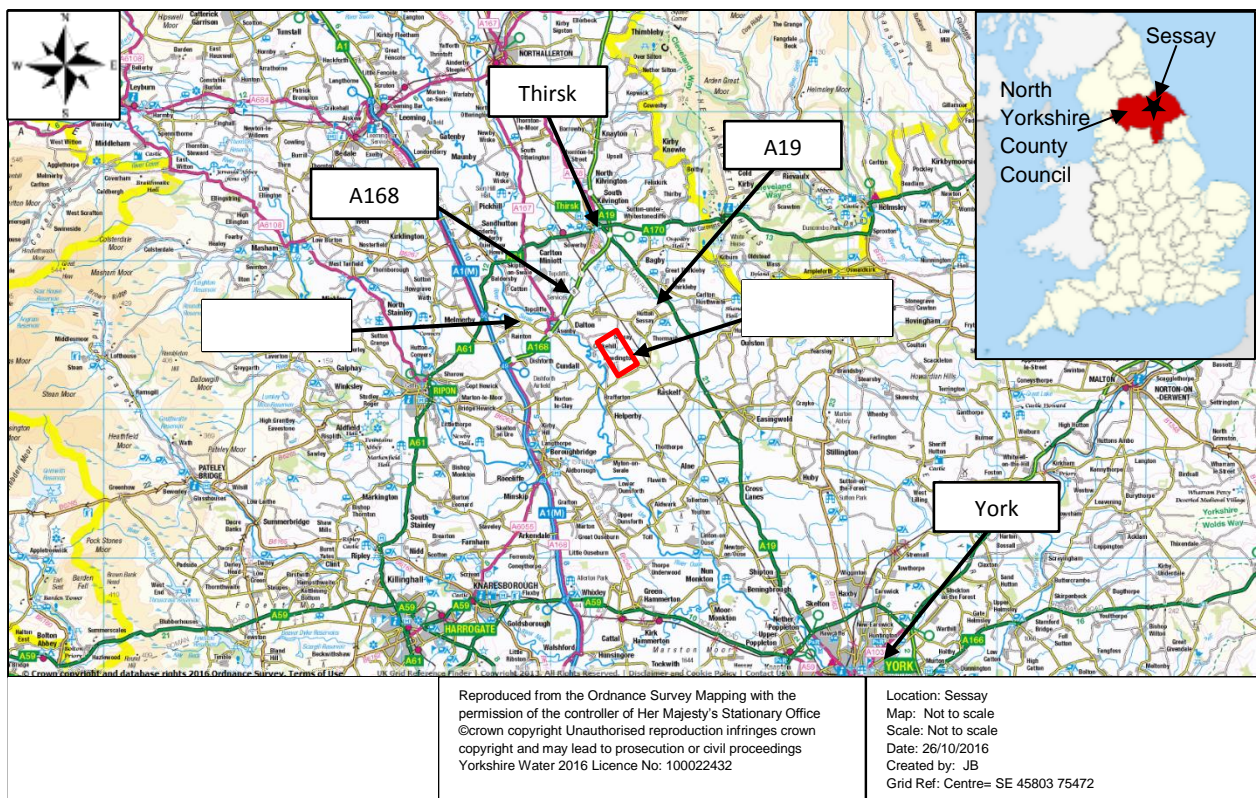


Figure 2.1 Location Map of Sessay (Source: NYCC)

This report will investigate the sequence of events that resulted in the internal flooding of 5 properties in Sessay on Boxing Day 2015. These were all residential properties, located in close proximity to Sessay Garth. The key locations relating to this report are shown in Figure 2.2.

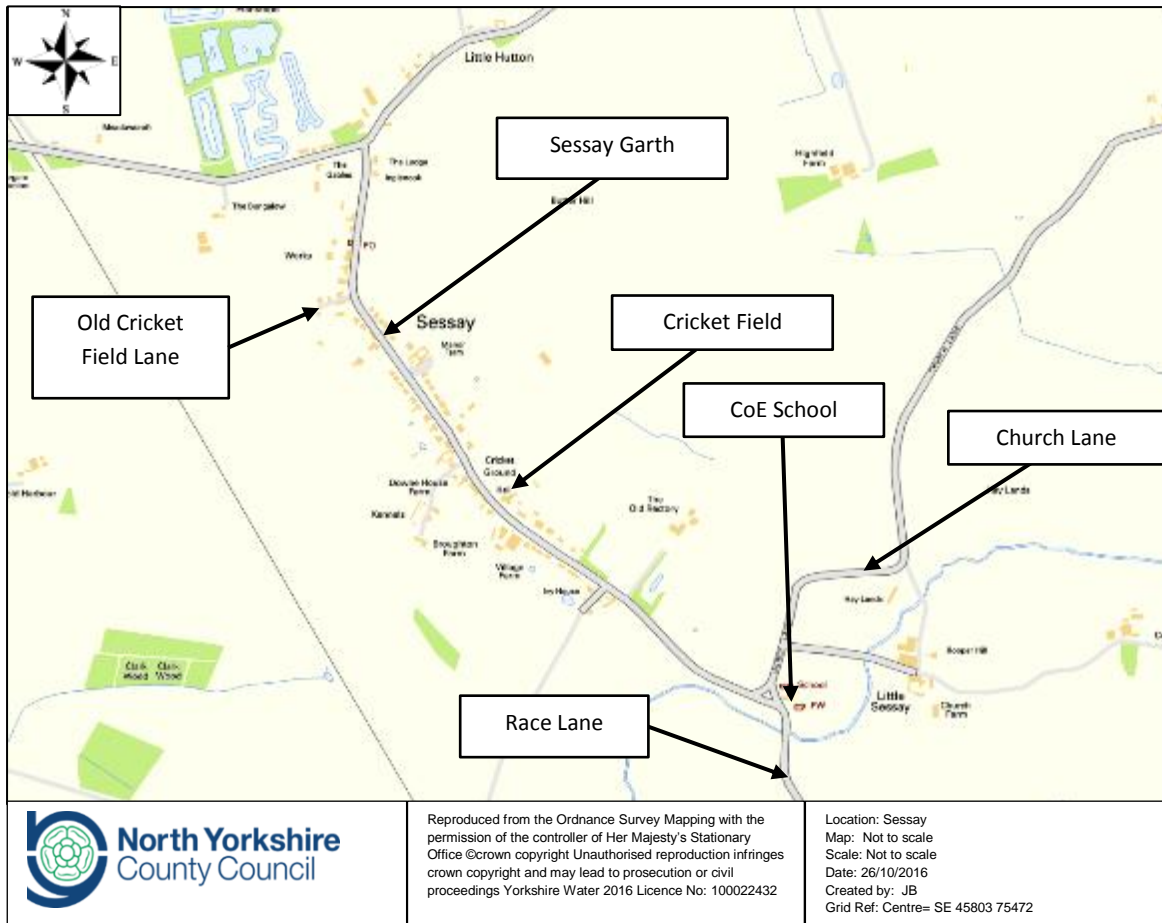


Figure 2.2 Local map of Sessay (Source: NYCC)

2.5 Topography

Sessay is situated in low lying flat land, as shown in Figure 2.3. The land surrounding Sessay is predominately agricultural with a gentle gradient falling from the north east to the south west.

On the east side of Sessay the land rises up from a level of approximately 30m AOD along Sessay Garth, on a gradual gradient up to Highfield Farm (at approximately 40m AOD). To the west the land gradually slopes toward Crakehill and the River Swale, the river banks are approximately 18m AOD east of Sessay.

The soil characteristics are fine and coarse loamy over clay and clayey soils. The geology is glaciolacustrine and glaciofluvial drift. The ground is slowly permeable but is seasonally waterlogged.

On the better quality areas of soil, cropping and land uses are cereals, sugar beet and potatoes.

As a result of cultivation and the loss of grassland, much of the land to the west of Sessay has lost its surface water attenuation function.

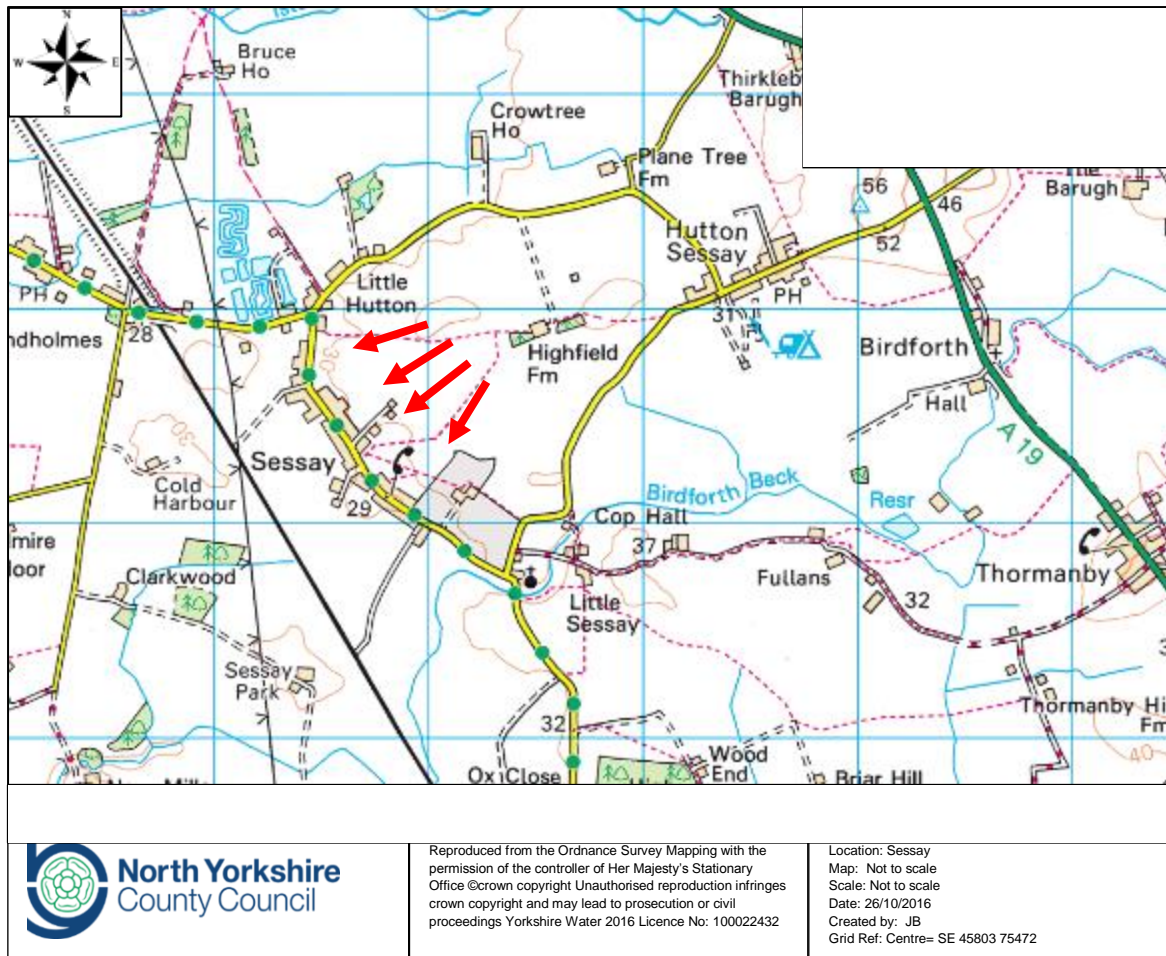


Figure 2.3 Topography map (Source: NYCC)

2.6 The River Swale and Birdforth Beck

The River Swale is classified as a main river and is a major tributary of the River Ure, which becomes the Ouse near Linton-on-Ouse. The Swale has a catchment area of 1446km² and a length of 118km¹. Land use in the Swale catchment is predominantly agricultural. Sessay is 3.5km to the east of the River Swale.

Birdforth Beck (also called Sessay Beck over some sections) meanders through agricultural land and joins the river Swale near Crakehill. Birdforth Beck, shown in Figure 2.4, is an ordinary watercourse that runs from east to west, south of the junction of Church Lane, Sessay Garth and Race Lane². Sessay is not included in an Environment Agency Flood Zone where sea and river flooding is forecast³ but parts are identified, where surface water ponding is forecast to occur⁴.

¹ About River & Catchment River Swale, Yorkshire Dale River Trust

² OS Mapping

³ Flood Map for Planning (River and Sea), Environment Agency

⁴ Surface Water Flood Risk, Environment Agency

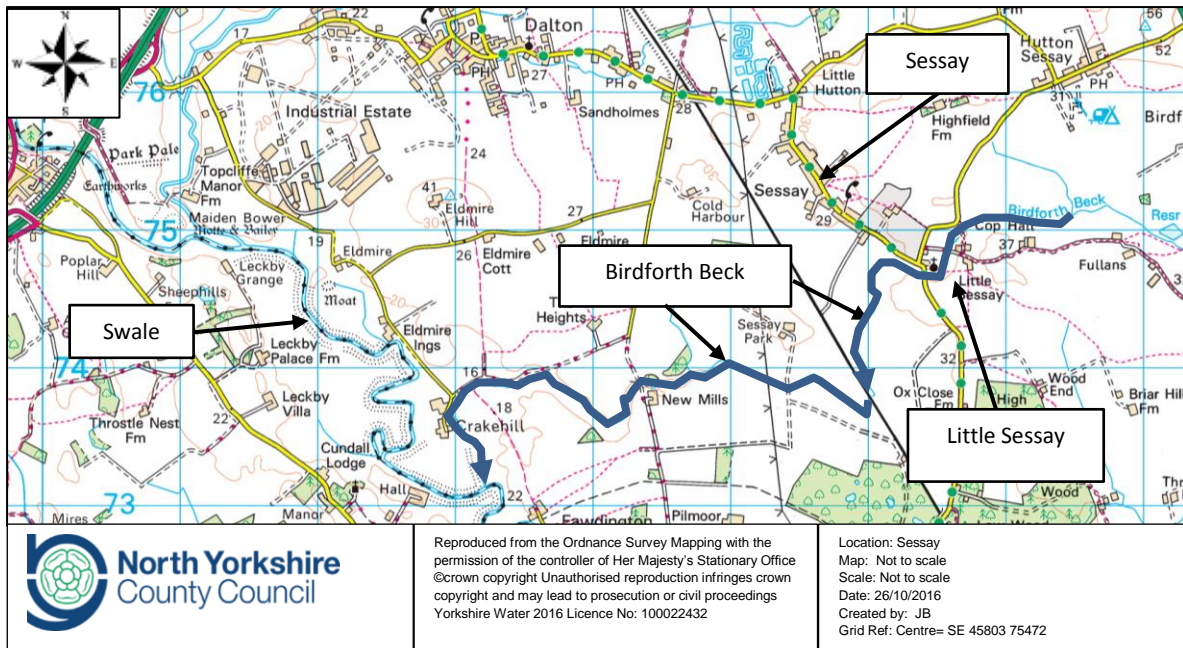


Figure 2.4 River Swale and Birdforth Beck map (Source: NYCC)

2.7 Highway gullies

Sessay Garth is the highway passing through the centre of the village of Sessay. Sessay Garth is drained via conventional road gullies⁵, as shown in Figure 2.5. Sessay Garth is a single carriage way without kerbs. There are no available highway drainage plans for Sessay.



Figure 2.5 Photograph showing Sessay Garth highway drainage (Source: Google Maps)

⁵ Site Insection

2.8 Public sewers

Sessay has a foul sewer system that flows from south to north along Sessay Garth, owned by Yorkshire Water Services Ltd (YWSL). The system contains a southern and a northern pumping station, as shown in Figure 2.6. The foul discharges from the majority of Sessay are pumped via the southern station to just south of Old Cricket Field Lane. Flows from the pumped foul system then combine with foul discharges from the northern side of Sessay and Little Hutton, and drain towards the other pumping station at the northern end of the village. These flows are subsequently pumped at the northern station via a rising main towards Dalton⁶.

The northern pumping station also pumps the combined sewer flows entering the system from Hutton Sessay⁶. However, flows from this Hutton Sessay sewer are prevented from entering the pumping station during heavy rainfall. This inflow is closed when the telemetry system recognises that a particular water level has been exceeded. This operation reduces the risk of overloading the pumping station, which would result in Sessay's foul sewer system backing up⁷.

⁶ Sewer Maps, Yorkshire Water Services Ltd

⁷ Section 14, Yorkshire Water Services Ltd

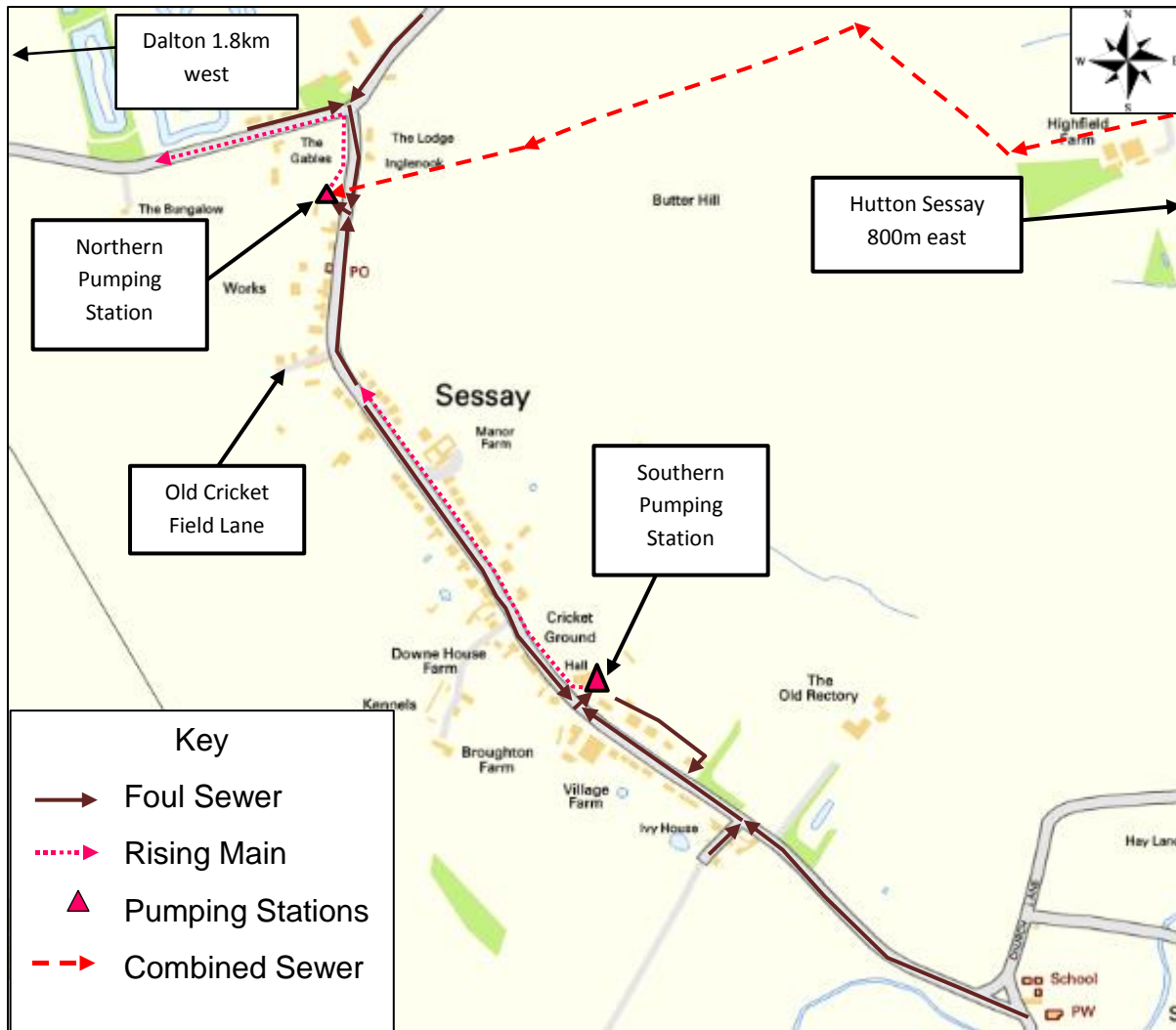


Figure 2.6 Sessay foul sewer system (Source: NYCC)

YWSL are responsible for the public foul sewer network only in Sessay. Arrangements for the management of surface water are unknown, and further investigation is necessary to map and ascertain both the condition of and responsibility for surface water sewerage.

YWSL are aware of on-going issues with the pump stations in Sessay⁸. They use tankers to remove sewage when the pumps are not working, and have committed to review the maintenance of the pumps to reduce such incidents. On this occasion the past performance of the pumps had no bearing on the incident as the capacity of the pumps was greatly exceeded.

YWSL confirmed that the results of their investigation show that during periods of heavy rainfall surface water from around the School infiltrates into the foul sewer. This means that additional flows are directed into the northern pumping station which exceed the designed capacity of the pump, causing it to malfunction. This is discussed further in Section 3 of this report⁸.

⁸ Parish Council Minutes

3 Flood Events

3.1 Rainfall Data

3.1.1 Meteorological Conditions

The rainfall event was characterised by two distinct rainfall systems. The first rainfall system was Storm Eva which brought high winds and a band of rain which spread across the country on the 23rd & 24th December 2015. The second system was a slow moving low pressure system and warm frontal zone, moving across the region from the west, on the 25th and 26th of December. The rainfall which caused the flooding was brought on by the weaker second low pressure system⁹.

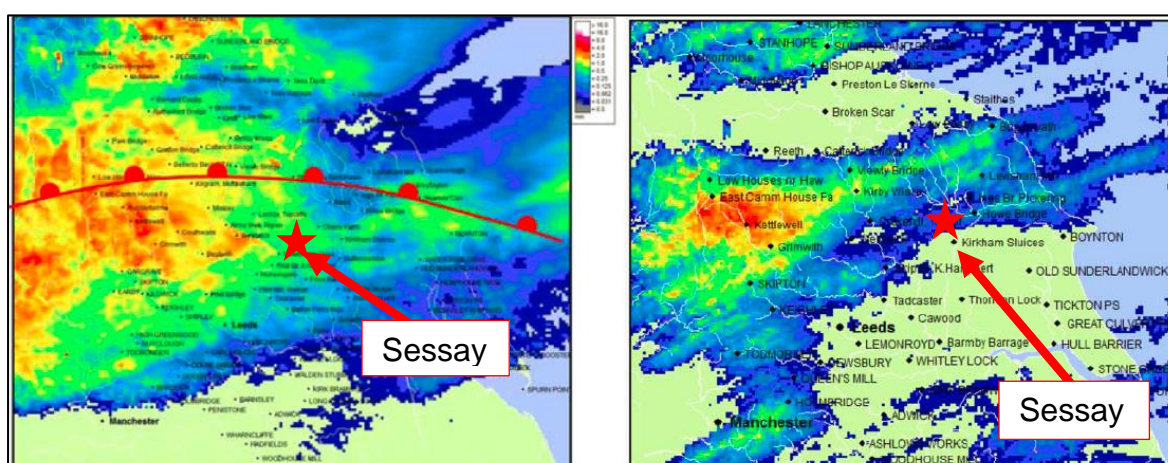


Figure 3.1 Radar image with overlaid front as of 18:00 on 25th December 2015 (left) and 01:00 on 26th December 2015 (Right) Copyright Meteorological Office

A warm frontal zone passed over the UK during the morning of 25th December, bringing scattered showers with it, and by midday there was a blanket of rainfall covering Yorkshire. During the evening of the 25th December an occluded front had set over the north-west and north-east and it was this front which produced the more intense rainstorms. There were two main pulses of heavy rainfall that led to the flooding experienced over Yorkshire. The first pulse occurred once the occluded front had formed during Christmas Day afternoon and evening. The second pulse occurred in the early morning of Boxing Day. The two main pulses of heavy rainfall were mainly confined to the upper catchment of rivers Aire, Calder, Wharfe and Swale⁹.

3.1.2 Antecedent conditions

A data set from the National Climate Information Centre (NCIC) shows the wettest rankings for November 2015. The percentage of the Long Term Average (LTA) rainfall in the wettest catchments exceeded 200%. This indicates that the ground

⁹ Hydrology of the December 2015 Flood in Yorkshire, Environment Agency

was already saturated from rainfall in November, prior to the exceptionally wet December 2015⁹.

Thus before the event the northern and western catchments of Yorkshire had generally received more than the LTA rainfall for December, particularly in the upper catchments. The EA have stated that the Yorkshire catchments, with exception to the lower Ouse and Humber estuary, were fully saturated from the beginning of December.

3.1.3 Sessay Rainfall Event

YWSL have provided rainfall radar data for the rainfall event in the Sessay area. This data shows that the peak rainfall fell on Boxing Day producing a rainfall depth of 35mm in 12hours, and a second lower peak on Christmas Day of 20mm in 12.75hours¹⁰.

Environment Agency tipping bucket raingauge (TBR) rainfall data has been provided for York Acomb Landing 26km away from Sessay. The rainfall data is illustrated in Figure 3.2. The data from the TBR shows two rainfall events on the 25th and 26th of December 2015. The rainfall event on the 25th started at 12:00 and finished at 23:00. The rainfall event on the 26th started at 02:30 and finished at 14:00 reaching a peak at 08:00. The total rainfall depths on Christmas and Boxing Day were 22.6mm and 34.2mm respectively¹¹.

Comparison of the data from York Acomb Landing with rainfall radar data from YWSL shows a good match. Within approximately the same time periods as the YWSL data, the York Acomb data indicated that 34mm of rainfall fell on Boxing Day and 17mm on Christmas Day.

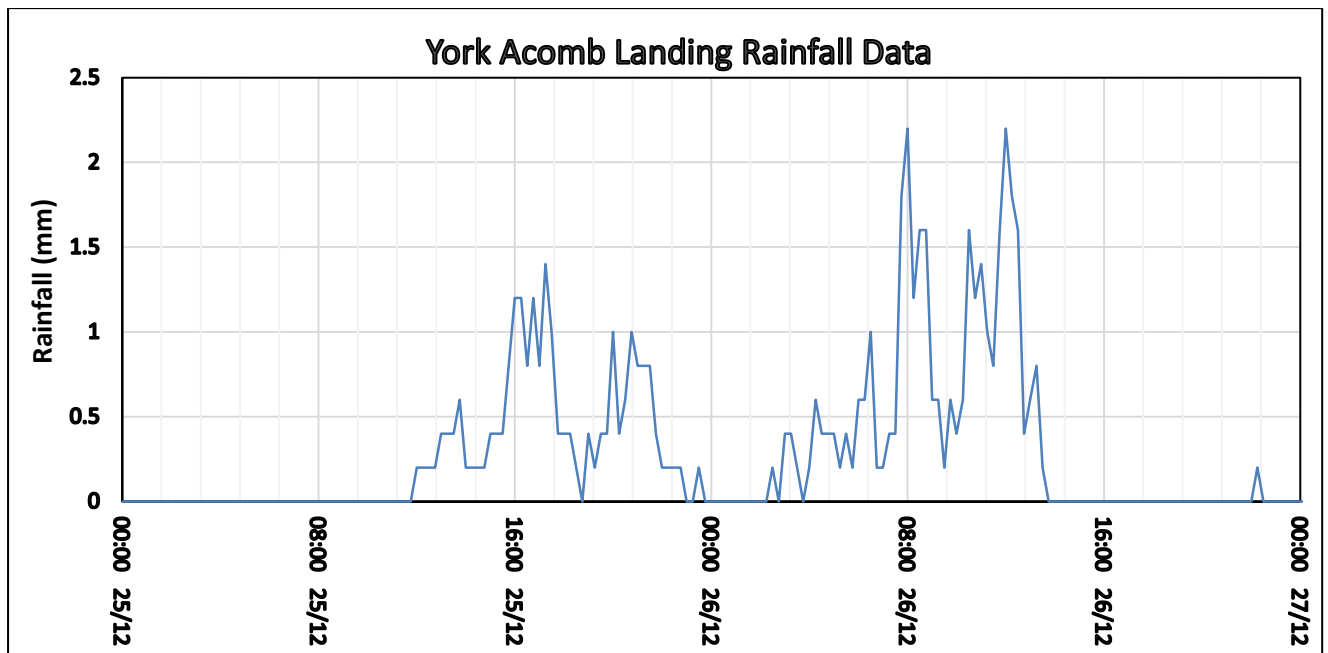


Figure 3.2 TBR Data for York Acomb Landing on the 25th and 26th of December.

¹⁰ Rainfall Radar Data, Yorkshire Water Services Ltd

¹¹ Hydrometric Data, Environment Agency

3.2 Description of Events

The rainfall events over the Christmas period resulted in the flooding of five properties in Sessay on the 26th of December 2015¹². The first pulse of rainfall ensured the agricultural land surrounding Sessay was fully saturated. The excess rainfall resulted in surface water running over the surrounding agricultural land which travelled downhill towards Sessay. The second pulse of rainfall on Boxing Day 2015 fell on ground that was already saturated. As the ground was unable to absorb any of this rainfall, water flowed towards the village¹³. The majority of the rain water arriving at Sessay Garth flowed from adjacent fields.

The highway surface water drainage system had insufficient capacity to receive rainwater runoff and this resulted in floods along low spots along Sessay Garth¹⁴.

Ponding began to form on the cricket pitch, which is approximately the same elevation as the road, due to water running off the fields to the east and the rainfall on the pitch itself¹⁴. It has been reported that there are land drains under the cricket pitch which outfall to a local drainage ditch system that eventually discharge into Birdforth Beck over 700m away. It appears that the surface water depth on the pitch continued to increase as it was saturated. There are no details of any drainage ditches, however by looking at the EA's surface water flood risk map Figure 3.3, the high flood risk area coincides with the Cricket Pitch and there is an indication of shallow surface water flooding between the cricket pitch and Birdforth Beck.

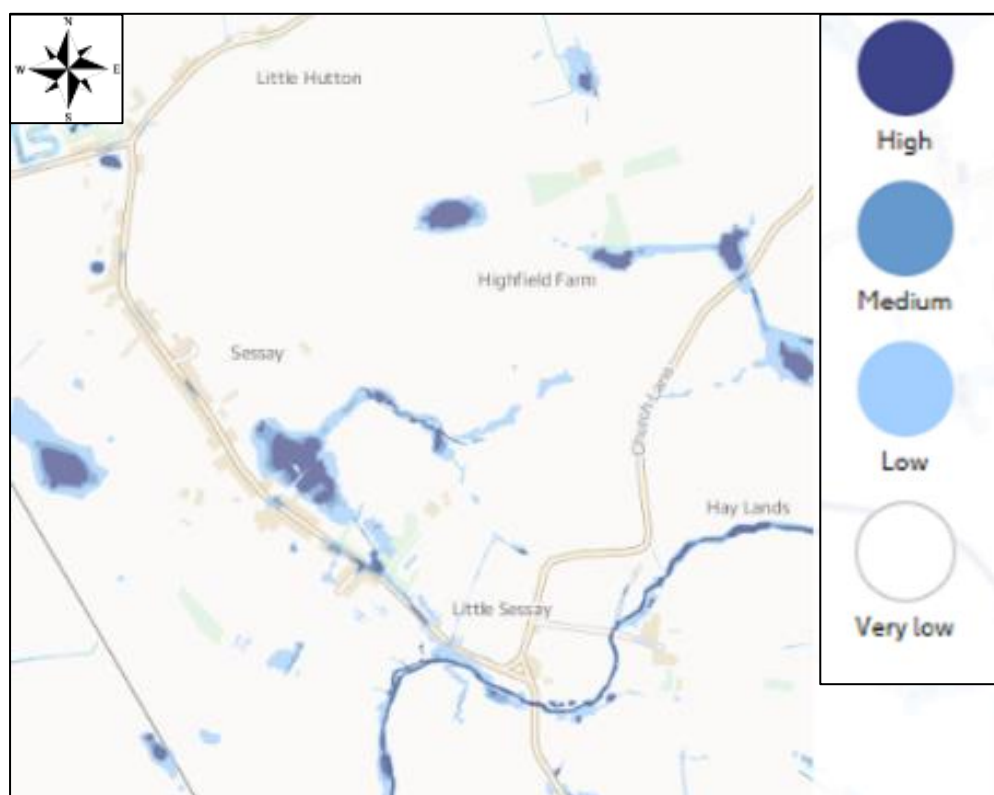


Figure 3.3 EA Surface Water Flood Risk map

¹² Flooded Properties Map, North Yorkshire County Council

¹³ Rolling Ball Analysis, North Yorkshire County Council

Surface water in the field adjacent to Sessay Garth and opposite Old Cricket Field Lane flowed to its lowest point opposite Old Cricket Field Lane, as shown in Figure 3.4. The surface water in this location increased in depth and began to flow onto Sessay Garth¹⁴.

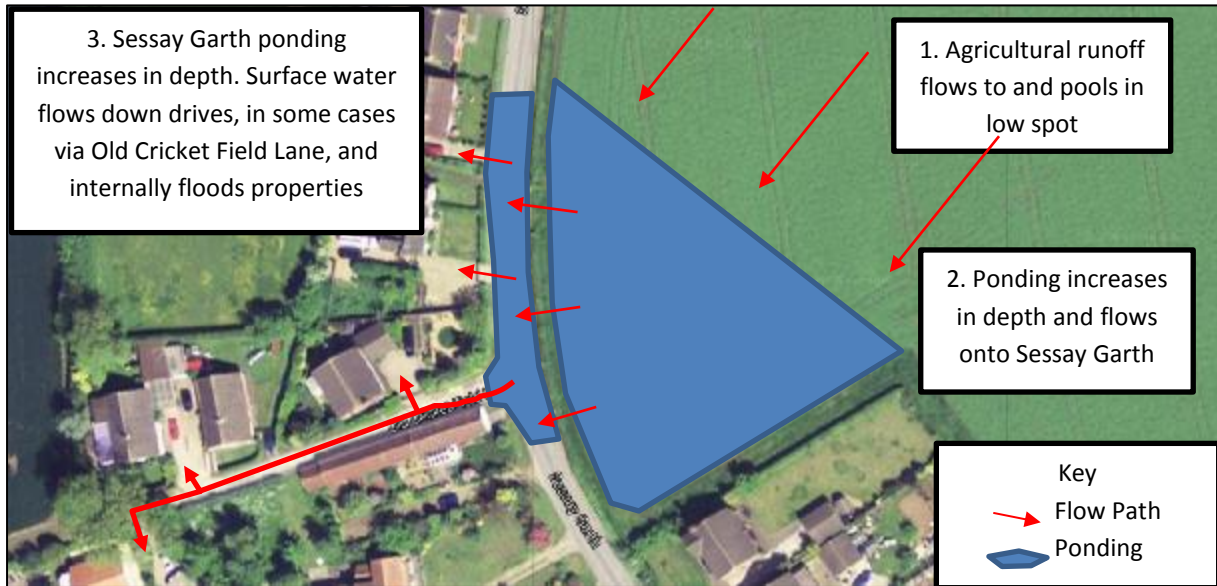


Figure 3.4 Mechanisms of flooding in Sessay

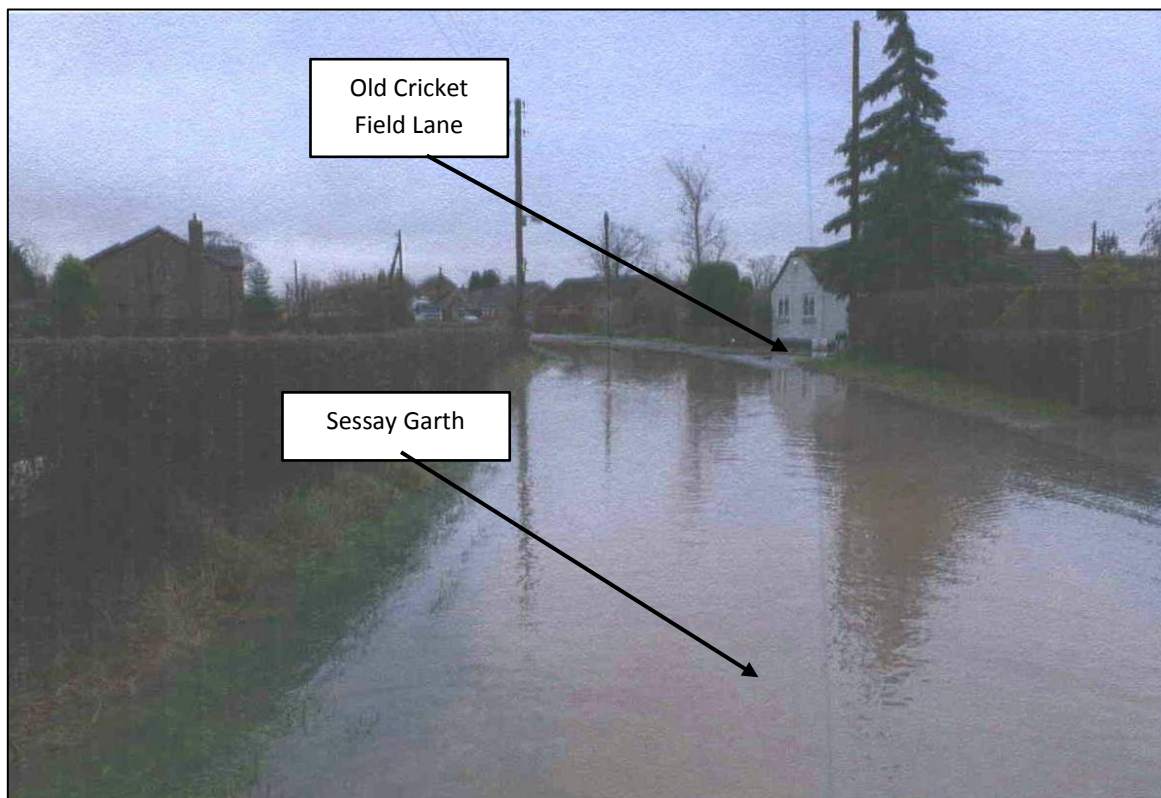


Figure 3.5 Photograph showing water flowing from agricultural land onto Sessay Garth in previous event

¹⁴ Discussion with North Yorkshire County Council

During the rainfall event on the 26th December the highway drainage system could not cope with the amount of surface water coming on to the highway⁸. The collector pots began to overflow forming ponding on the highway surface, the primary source of surface water was runoff from the agricultural land to the east¹³. Sections of Sessay Garth road were flooded on Boxing Day 2015. In particular, an area defined in Figure 3.5, opposite Old Cricket Field Lane. Runoff from the agricultural land aided by highway surface water, caused surface water to flow into driveways and down Old Cricket Field Lane^{14, 8}. The flood water then flowed towards and proceeded to enter the properties on Old Cricket Field Lane and Sessay Garth.

YWSL have proved that surface water runoff from around the School entered the foul sewer in Sessay Garth. The volume of surface water entering the system caused the northern pumping station to become inundated, which resulted in sewer water backing up. Yorkshire Water attended the site to remove foul water by tanker to prevent the pump station from overflowing¹⁵.

A resident reported there was restricted toilet use during the event. Residents have reported that the operation of the northern Pumping Station in Sessay is interrupted as a result of overloading by surface water during heavy rainstorms⁷.

The locations of flooding in Sessay on 26 December 2015 were compared against the EA Map of Surface Water flood Risk as shown in Figure 3.3^{4,12}. This revealed that the extent of flooding experienced was greater than that described on the surface water flood risk map. This indicates that the rainfall and runoff significantly exceeded that which was used to develop the map and exceeded the capacity of the sewer system, making a significant contribution to flooding.

River Swale and Birdforth Beck

None of the flood events in Sessay on Boxing Day 2015 were generated by the river Swale. The EA's map of flood risk rivers and the sea (see Figure 3.6) shows that there are areas around Birdforth Beck that are at risk of flooding. There were no reports recorded of property or highway flooding at this location in December 2015.

¹⁵ Discussions with Yorkshire Water Services Ltd



Figure 3.6 EA Map of risk of flooding from rivers and the sea

Highway Gully’s

Residents reported Highways gullies were blocked and this was noted in the minutes of the Parish Council meeting 20th January 2016¹⁶.

¹⁶ Section 14, North Yorkshire County Council Highways Authority

4 Risk Management Roles, Responsibilities and Actions

4.1 RMA Responsibilities

4.1.1 Environment Agency

Under the FWMA the Environment Agency (EA) has a strategic overview role for all sources of flooding as well as an operational role in managing flood risk from Main Rivers, reservoirs and the sea. As part of this role the EA have developed a National Flood and Coastal Erosion Risk Management Strategy for England – ‘Understanding the Risks, Empowering Communities, Building Resilience.’

This national strategy outlines the EA’s strategic functions as:

- Ensuring that flood risk management plans (FRMPs) are in place and are monitored to assess progress. The plans will set out high-level current and future risk management measures across the catchment.
- Publishing and regularly updating its programme for implementing new risk management schemes and maintaining existing assets.
- Supporting risk management authorities’ understanding of local flood risk by commissioning studies and sharing information and data.
- Supporting the development of local plans and ensuring their consistency with strategic plans.
- Managing and supporting Regional Flood and Coastal Committees and allocating funding.

The EA’s operational functions include:

- Risk-based management of flooding from main rivers, including permissive powers to do works including building flood defences.
- Regulation of works in main rivers through the consenting process.
- Regulation of reservoirs with a capacity exceeding 10,000m³.
- Provision of a flood forecasting and warnings service, working with the Met Office Hazard Warning Service.
- The maintenance and operational management of Main River assets including flood defences.
- Statutory consultee to the development planning process.
- The power to serve notice on any person or body requiring them to carry out necessary works to maintain the flow in Main Rivers.

‘Main Rivers’ are defined through an agreed map which is updated 2-3 times per year to reflect changes in the designation of a watercourse or in the environment.

These Main Rivers tend to be the larger rivers in the country, though some smaller watercourses in sensitive locations are also defined as 'Main Rivers'.

The EA are also category 1 responders regarding flood risk (Civil Contingencies Act 2004). They are required to warn and inform of flood risk.

4.1.2 Water Company

Water companies in England and Wales are named as a Risk Management Authority under the Flood and Water Management Act 2010 and must have regard to the Local Strategy of the LLFA. They are required to manage risks associated with assets or processes that may cause or be affected by flooding, and must share relevant data with other flood risk authorities.

They also have flood risk management functions under the Water Resources Act (1991). Relevant actions of water companies include: the inspection, maintenance, repair and any works to their drainage assets which may include watercourses, pipes, ditches or other infrastructure such as pumping stations.

The Civil Contingencies Act 2004 (CCA) also designates water and wastewater undertakers as statutory category 2 responders to national disasters and emergencies, placing on them duties to share assured information with other responders in an appropriate manner.

4.1.3 North Yorkshire County Council (NYCC)

NYCC, as LLFA, have flood risk management functions which include (but are not limited to);

- Provision of a Local Flood Risk Management Strategy (LFRMS).
- Designation and maintenance of a register of structures or features that have a significant effect on flood risk.
- Consenting and enforcement works on Ordinary Watercourses.
- Responding to statutory consultations on drainage proposals in planning applications.
- Undertaking Section 19 investigations.

NYCC also has responsibilities as a Highways Authority and as an Emergency Responder (under the Land Drainage Act 1991 and the S19 Flood Investigation Report Civil Contingencies Act 2004 respectively) which may relate to flooding.

Highway Authorities are responsible for providing and managing highway drainage which may include provision of roadside drains and ditches, and must ensure that road projects do not increase flood risk.

The Highways Authority has a duty under the Highways Act 1980 to maintain highways that are maintainable at public expense. This includes a duty to maintain existing highway drainage. Highway drainage systems are designed to take highway surface water. Highway drainage systems are not designed as "storm

drains”, and do not have the capacity for the level of rainfall from an extreme flash flood. The Highway Authority has powers to improve drainage systems but no duty to do so.

Roadside gullies are subject to routine maintenance in accordance with the NYCC Highway Asset Management Plan. The frequency of cleaning is dependent on an evidence based categorisation of risk, determined by factors relating to the consequence of failure and a range of other operational factors.

4.1.4 District or Borough Council

District and Borough Councils are named as Risk Management Authorities within the Flood and Water Management Act 2010, and are required to comply with the LLFA Local Strategy. Through the planning processes, they control development in their area, ensuring that flood risks are effectively managed.

In addition, in relation to the Civil Contingency Act (2004), the District and Borough Council:

- Is a Category 1 Responder. On a priority basis, they will provide sandbags to residents and businesses where property is at risk of flooding.
- Support the Emergency Services on request by providing Incident Liaison Officers.
- Provide emergency accommodation – i.e. set up rest centre as required and other welfare provision.
- Assist with arranging transport or evacuating areas.
- Participate in vulnerable people searches.
- Assist with co-ordination of recovery.

The NYCC Emergency Planning Unit provides support to the District Council.

4.1.5 Internal Drainage Board

Internal Drainage Boards (IDBs) are local operating authorities established in areas of special drainage need (typically low lying areas) in England and Wales. Their primary role is to manage water levels and reduce the risk from flooding within their designated drainage districts. Their work includes;

- Maintenance and improvement works on watercourses and related infrastructure.
- Consenting works on Ordinary Watercourses.
- Responding to consultations on drainage proposals in planning applications.
- Exercising permissive powers to undertake works where appropriate.

In managing water levels IDBs also have an important role in reducing flood risk in areas beyond their administrative boundary.

4.1.6 All Risk Management Authorities

All RMAs under the Flood and Water Management Act (2010) have a responsibility to cooperate and coordinate with regards to their flood risk management functions, including raising awareness of flood risk and the sharing of information.

4.1.7 Riparian Owners

Landowners whose land is adjacent to a watercourse are known as 'riparian owners'.

A landowner can be an individual e.g. home owner or farmer, private business or an organisation e.g. the district council as park owner, on school grounds the county council as property owner.

A watercourse is defined as every river, stream, ditch, drain, cut, dyke, sluice, sewer (other than a public sewer) and feature through which water flows, but which does not form part of a Main River.

Riparian owners have legal duties, rights and responsibilities under common law and the Land Drainage Act 1991 for watercourses passing through or adjoining their land. These responsibilities are to:

- Pass on the flow of water without obstruction, pollution or diversion affecting the rights of others.
- Accept flood flows through their land, even if these are caused by inadequate capacity downstream.
- Maintain the banks and bed of the watercourse and keep structures maintained.
- Keep the bed and banks free from any artificial obstructions that may affect the flow of water including clearing litter, heavy siltation or excessive vegetation.

Guidance on the rights and responsibilities of riparian ownership are outlined in the Environment Agency publication 'Living on the edge', available at

<http://www.environment-agency.gov.uk/homeandleisure/floods/31626.aspx>

4.2 Actions and Responses to December 2015 Floods

4.2.1 North Yorkshire County Council as Lead Local Flood Authority

The Flood Risk Management (FRM) Team provides an overarching view on flood risk management activities within the county. The FRM team have undertaken the following activities;

- Supported a resident of Sessay in obtaining Flood Resilience Grants for profiling of a driveway to prevent flood water flowing from road towards the property.
- Local area officers have coordinated with other Risk Management Authorities to investigate the flood event that occurred in Sessay.
- NYCC FRM team have attended meetings with members of the Parish Council to discuss flood risk issues in Sessay.

4.2.2 North Yorkshire County Council as Highway Authority

The Highway Authority carries out regular maintenance of the highway drainage system. NYCC Highway Authority has undertaken the following activities:

- Undertaken inspections and jetting activities to the highway drainage system.
- Some locations have been identified where chamber covers need to be dug out in order to allow further inspection of the highway drainage network.
- Surveys need to be carried out to enable the highways drainage network to be mapped.

4.2.3 The Environment Agency

There are no localised proposals for new works generated by the Boxing Day 2015 Floods.

4.2.4 Yorkshire Water Services Ltd

YWSL has undertaken the following post flood event activities:

- Dye testing of surface water drains around the school has confirmed that surface water from around the School is connected to the foul sewer.
- Highlighted that YWSL had expressed concern that drainage from the new school classrooms might adversely impact volumes/flow rates at the pumping station. Application drawing suggested that the proposed surface water arrangements were simply an extension to the existing system.
- Records indicated that there has been an increase frequency of flooding since 2013 when the school extension was completed.
- Removal by tanker of foul flows from the pumping station has been carried out to prevent foul flows backing up in the system when it gets overloaded or breaks down.
- There is CCTV investigation work ongoing in Sessay to identify where surface water drainage is incorrectly connected to the foul sewer and whether there are any other locations where surface water is able to infiltrate.
- Confirmed that the combined sewer from Hutton Sessay operates on a telemetry system that prevents flow towards Sessay when Sessay pumping station is in flood conditions. This rules out this input as a potential cause of the northern pumping station capacity problem.

4.2.5 Hambleton District Council (HDC)

HDC has undertaken the following post flood event activities:

- Supply and provision of Sandbags.
- Face to face support and advice offered to vulnerable householders in the immediate aftermath.
- Identified those properties affected by flooding during Storms Desmond and Eva.
- Supported affected residents with council tax relief payments.
- Supported affected residents with initial £500 flood payments.

4.2.6 Sessay Parish Council

Sessay Parish Council has undertaken the following post flood event activities:

- Providing residents with information to increase flood resilience with support from NYCC.
- Providing residents with emergency FRM contacts.
- Engagement with local MP, EA, NYCC and YWSL.
- Development of a Community plan.
- Informed NYCC on locations of blocked gullies.
- Confirmed the need for a Surface Water Management Plan.

Flood risk is an issue that has been raised by the Parish Council. A public meeting was held on 20th January 2016.

4.3 Conclusions

The significant flooding experienced in the village of Sessay on December 26th 2015 was caused by a period of intense rainfall falling on already saturated ground. The village lies along the foot of a slope and this report identifies a lack of attenuation in the fields beyond the village associated with land use.

Rain which fell on sloping land flowed downhill as surface water and accumulated in the village, overwhelming local drainage arrangements. Highway drains and sewers are not built to cope with excessive rainfall events, nevertheless the depth and duration of flooding can be reduced if water management systems are well maintained and working at their maximum capacity.

The arrangements for the management of surface water in Sessay are not currently known or understood, nor is it known who is responsible for them. Whilst it is unlikely that the present arrangements could have coped with the amount of surface water coming into them, there may be maintenance activities that could materially improve the situation and reduce flood risk. An accurate understanding of the current system for managing surface water is essential to inform future improvements and any further development of the village.

Yorkshire Water is continuing to investigate locations where surface water is infiltrating the foul sewer network and causing problems with their pump stations in Sessay. In particular they have highlighted water coming from the village school overwhelming the northern pumping station. Whilst this is a result rather than a cause of the flooding experienced on Boxing Day 2015, residents have reported that more regular heavy rainfall events are causing problems with the village's foul sewer network.

Sessay Parish Council has called for a Surface Water Management Plan to be produced for the village. This would provide the appropriate framework for co-ordinating on-going work, including the recommendations above, and would provide a sound evidence base to inform future planning decisions so as not to exacerbate existing flood risk and to identify opportunities to reduce it.

4.4 Recommendations

To reduce the risk of future flooding in the location, the following recommendations are made:

NYCC in its capacity as LLFA to engage with local landowners and stakeholders, to identify opportunities to improve attenuation and reduce runoff.

YWSL to continue CCTV investigation of foul sewer, to maintain as necessary, and to identify and eliminate infiltration of the network.

NYCC in its capacity as highway authority to carry out investigations to map and inspect the highway drainage network, and carry out maintenance as necessary.

NYCC in its capacity as LLFA to work with YWSL and local stakeholders to investigate, map, inspect & ascertain responsibility for surface water network.

NYCC in its capacity as LLFA to coordinate all risk management authorities and interested parties to produce a Surface Water Management Plan.

NYCC as LLFA will continue to work with RMAs, and local stakeholders to develop plans to address the issues raised in this report.