Flood & Water Management Act 2010

Section 19 Flood Investigation Report
FI0118

Location: Ffordd Dewi, Oakenholt
Incident Date: 5th – 6th January 2025

CYNGOR Sir y Fflint
Flintshire
COUNTY COUNCIL

Document Control Sheet

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Revision History

Date	Version Number	Summary of Changes
25/04/2025	Draft Report	NA
01/09/2025	Final Version	NA
15/04/2026	Final Webpage Version	Minor grammar correction.

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Executive Summary

This report has been prepared for the purpose of meeting the requirements of Section 19 of the Flood and Water Management Act 2010. Under Section 19 of the Flood and Water Management Act 2010, the Lead Local Flood Authority (Flintshire County Council) on becoming aware of a flood in its area must, to the extent it considers necessary or appropriate, investigate, prepare and publish a Flood Investigation Report.

As a Lead Local Flood Authority (LLFA), it is the responsibility of Flintshire County Council (FCC) to manage the local flood risk from surface water, groundwater and ordinary watercourses such as streams and ditches (including lakes and ponds).

Section 19 of the Flood and Water Management Act 2010 states:

"On becoming aware of a flood in its area, a lead local flood authority must to the extent it considers 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 intending to exercise, those functions in response to the flood"

The flood risk management authorities in Flintshire are:

- Lead Local Flood Authority (LLFA)
- Highway Authority (HA)
- Natural Resources Wales (NRW)
- Dwr Cymru / Welsh Water (DCWW)

In early January 2025, a large weather system brought snow and rainfall to several areas of the UK. Data from Natural Resources Wales suggests between the 5th and 6th of January 2025, approximately 47.2mm of rainfall fell over 32 hours in Oakenholt.

The Lead Local Flood Authority have carried out a detailed investigation, including community engagement and communications with relevant stakeholders to gain an understanding of the nature of the January 2025 flood event. This Report provides details of the flooding incident.

8 properties are reported to have flooded internally with 1 further property experiencing external flooding. The primary flood mechanism was fluvial and surface water associated with the ordinary watercourse known as the Croes Onn stream. The relevant Flood Risk Management Authority identified in this instance is Flintshire County Councils Lead Local Flood Authority (LLFA) as the primary flooding mechanism was attributed to an 'ordinary watercourse'.

Table 1 states the 9 recommendations made in this report (see below or at the back of report).

Table 1 – Recommendations

Ref	Stakeholder	Recommended action	Current Progress
01	Lead Local Flood Authority	Identify the parties responsible for the ongoing maintenance of the culverts 1-4 identified on Figure 4 and communicate this with all interested parties to allow future issues to be reported and resolved.	Culvert 1: FCC (as Highways Authority) Culvert 2: Anwyl Homes Culvert 3: Anwyl Homes Culvert 4: Anwyl Homes To be communicated formally on publication
02	Riparian Owner(s)	Review the maintenance regimes of the ordinary watercourse systems on site (*both open watercourse and culverts).* ***(www.naturalresources.wales/flooding/owning-a-watercourse)***	Ongoing
03	Lead Local Flood Authority	Contact landowners downstream to desilt open watercourse downstream of 'Culvert 1' outfall.	Completed on 05.03.25 [See photograph log]
04	Anwyl Homes (Riparian Owner)	Continue working collaboratively on the land drainage and future SuDs for any further development of estate and undertake early engagement exercises for any new planning applications.	Ongoing
05	Anwyl Homes and Management Company (Riparian Owner)	Continue reviewing management boundaries and assets, clearly communicating with and updating residents and relevant authorities where appropriate.	Ongoing
06	Highways Authority (FCC)	Review the condition of 'Culvert 1' on Figure 4 and maintain accordingly	Completed (culvert desilted)
07	Residents	Consider forming a Flood Action Group to help prepare and manage future flood events.	N/A
08	Residents	Consider implementing property level flood protection measures (i.e air brick covers, flood gates/doors).	https://thefloodhub.co.uk/pfr/

09	Riparian Owner(s) / Local Community	Be vigilant to littering and fly tipping into watercourse.	N/A

1.0 Introduction

1.1 Since the introduction of the Flood and Water Management Act 2010 (FWMA) Flintshire County Council (FCC) is the designated Lead Local Flood Authority (LLFA).

1.2 Section 19 of the Flood and Water Management Act 2010 states:

"On becoming aware of a flood in its area, a lead local flood authority must to the extent it considers 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 intending to exercise, those functions in response to the flood"

1.3 Where a LLFA carries out an investigation then the report must be published, and any relevant risk management authorities notified.

1.4 The purpose of this Section 19 (S19) Flood Investigation Report is to identify the flood mechanism associated with the internal flooding experienced by properties in Ffordd Dewi, Oakenholt between the 5th and 6th of January 2025. This report will provide an overview of flooding mechanisms, identify relevant Risk Management Authorities and stakeholders, and provide a list of recommendations.

1.5 The opinions expressed in this report and the comments and recommendations given are based on an assessment of available information.

1.6 The information, views and conclusions drawn are based, in part, on information supplied to the Lead Local Flood Authority by other parties. The Lead Local Flood Authority has proceeded in good faith on the assumption that this information is accurate.

2.0 Study Area Overview

Location

2.1 The area reported to be affected by flooding during the rainfall between the 5th and 6th of January was limited to properties located along the road named 'Ffordd Dewi'. Figure 1 indicates the general study area.

Figure 1 – Study area

Geology

2.2 According to the British Geological Survey (BGS) online geology viewer[1], this part of Oakenholt is underlain by superficial deposits of Devensian Till. Devensian Till is described by the BGS as a diamicton meaning it has poorly sorted particles ranging in size within a matrix of sand or mud. This deposit is then underlain by a formation of sandstone.

2.3 On the surface, the soil texture is described as 'loamy and clayey' by the Soilscapes viewer from the Cranfield Environment Centre[2]. This type of texture causes drainage into the underlying geology to be impeded, causing greater and faster runoff on the surface. The recent development in this area also means the soil is likely to have, and still be compacted, limiting its storage capacity and infiltration rate further.

Hydrological Setting

2.4 An open watercourse referred to as the Croes Onn stream on plans is present within the study area and has an upstream catchment size of approximately 1.39 km² as indicated by Figure 2. Figure 3 outlines the topography of the study area using LiDAR data.

2.5 The catchment is primarily rural and used as agricultural land and has only recently seen development on it in the form of a housing estate. Water from this watercourse flows northwards and outfalls into the Dee estuary via a sluice gate.

[1] https://geologyviewer.bgs.ac.uk/?_ga=2.130828299.522985669.1738930329-182811052.1738930329
[2] https://www.landis.org.uk/soilscapes/

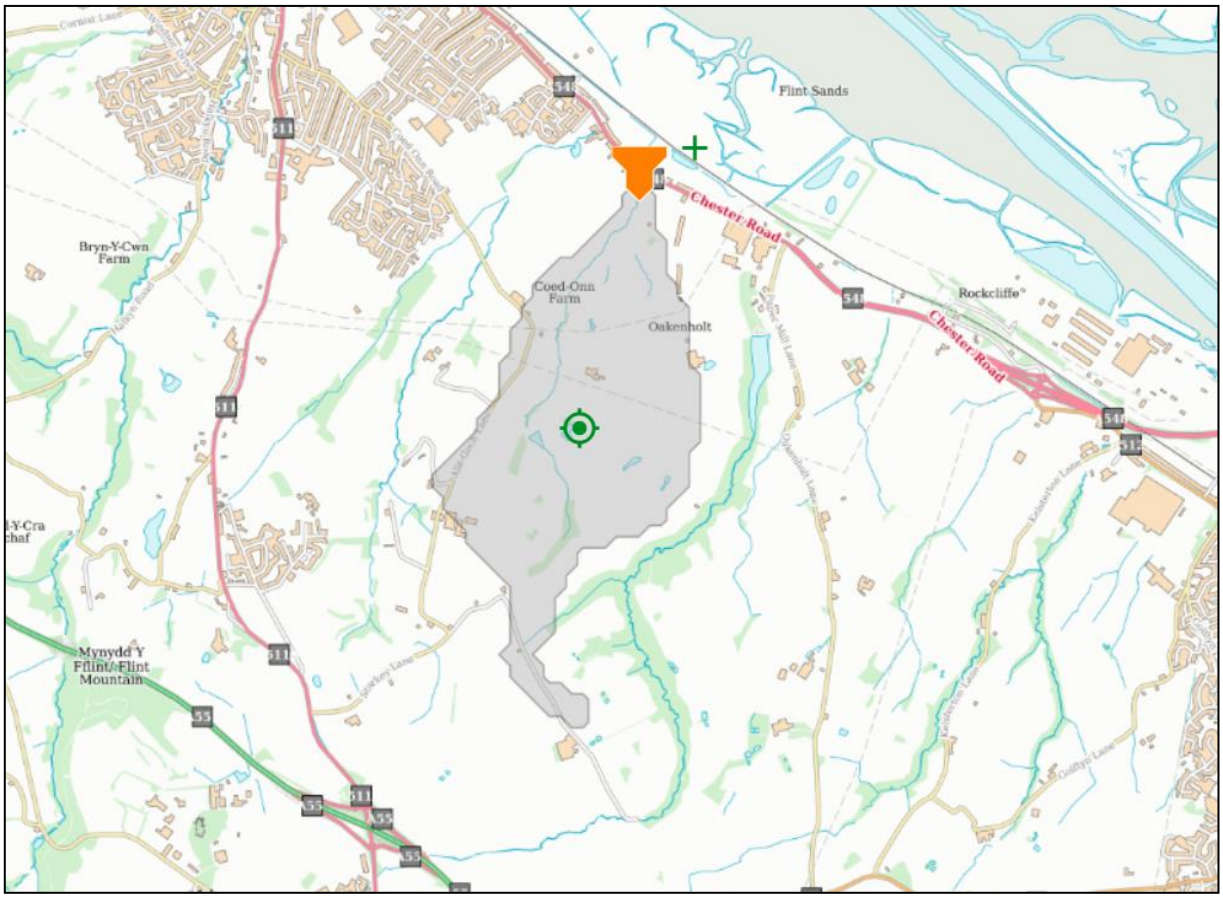


Figure 2 – Approximate catchment area of the Croes Onn watercourse.

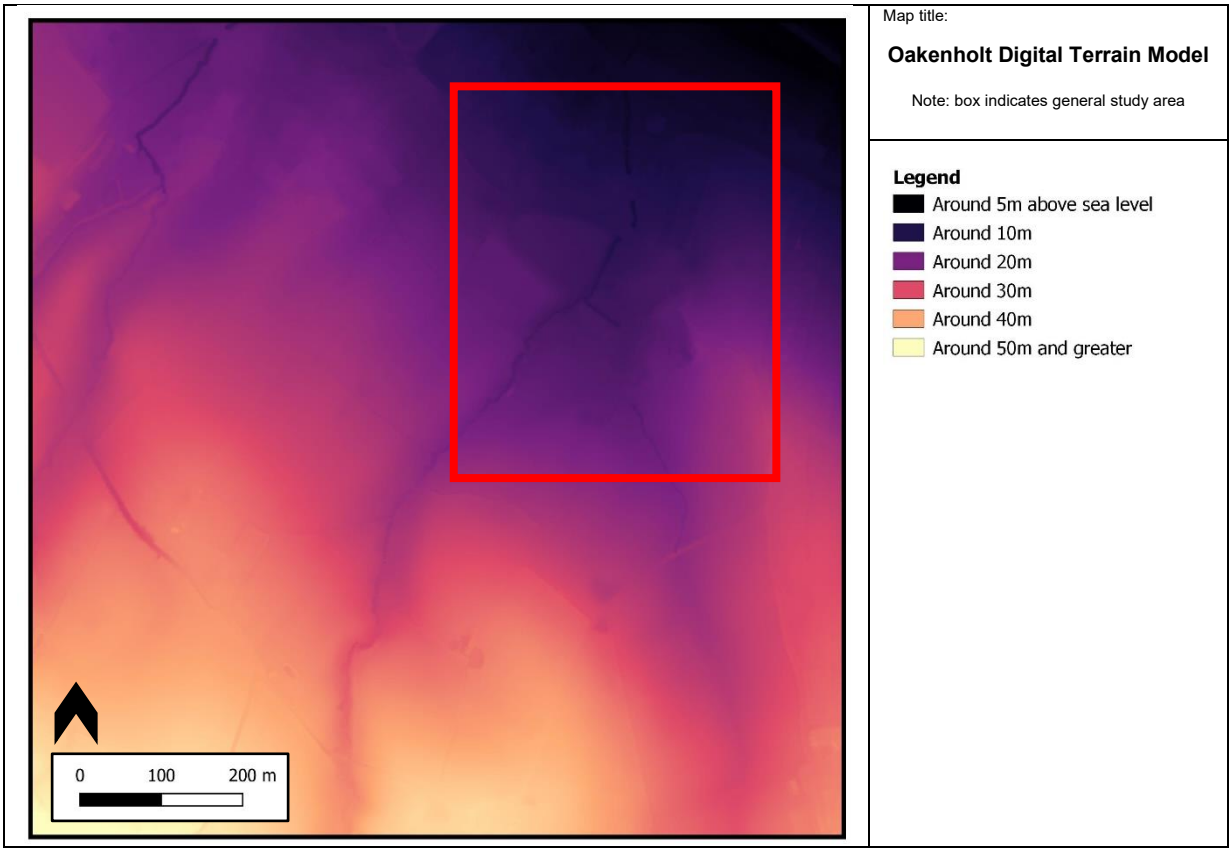


Figure 3 – Digital Terrain Model of Oakenholt

2.6 Parts of the open watercourse in the study area have been culverted as part of the development and the approximate routes are plotted below. A culvert is a structure, typically a pipe or box, that allows water to pass underneath an obstacle like a road or railway, (See photos in Appendix D for further route details).

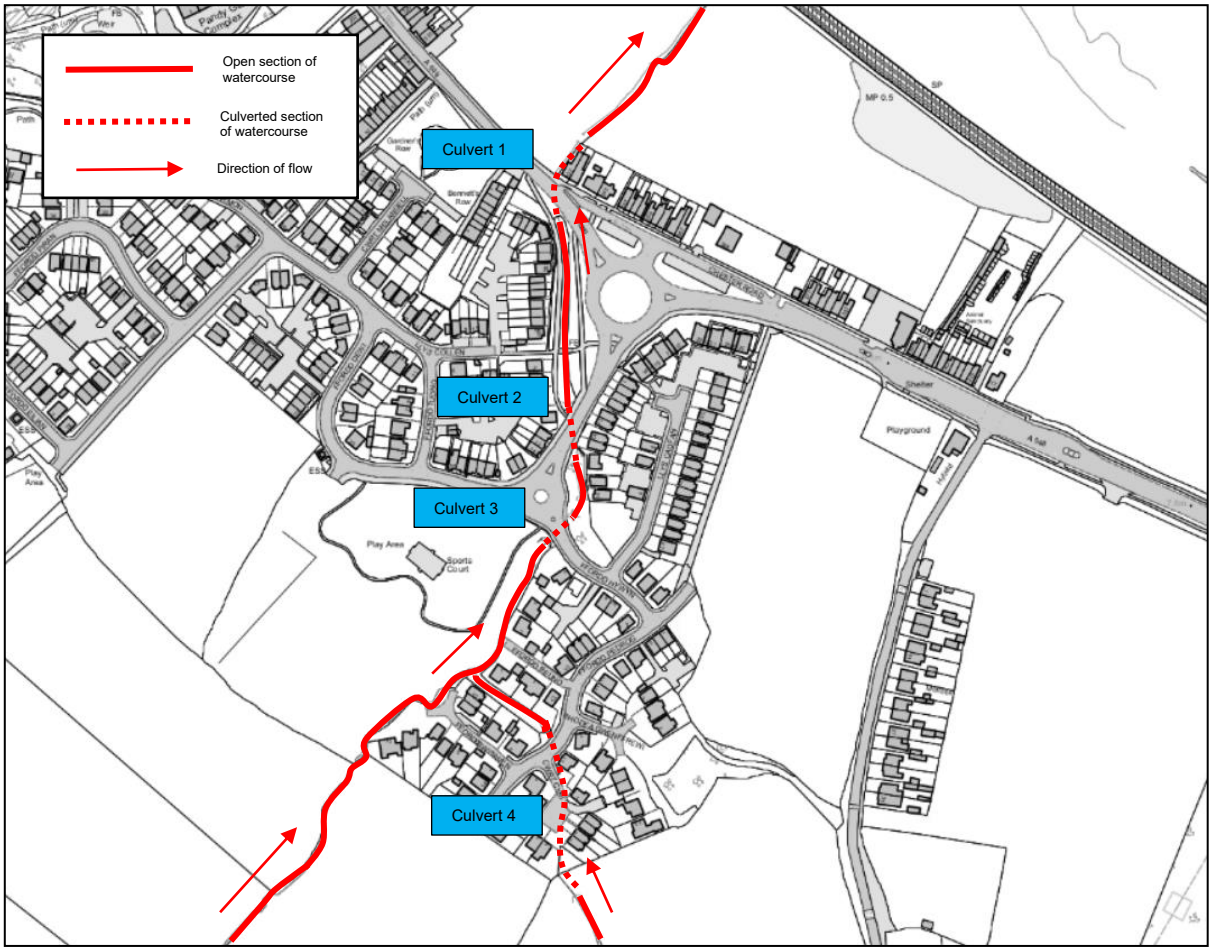


Figure 4 – Open and culverted sections of the Croes Onn stream watercourse

Drainage

2.7 Welsh Water maps located in Appendix A indicate the presence of two main sewers which collect foul and surface water and run underneath the highway towards the north-east. Based on maps provided by Welsh Water, the foul sewer connects to a combined sewer which is pumped north westerly while the surface water system outfalls into the Dee Estuary.

NRW Flood Risk Maps

2.8 The Natural Resources Wales (NRW) 'Flood Map for Planning'[3] in Appendix B indicates that part of the study area falls into Flood Zone 3 and 2 for surface water and small watercourses. Areas that fall into Flood Zone 2 are areas with a 0.1% to 1% (1 in 1000 to 1 in 100) chance of flooding from surface water and/or small watercourses each year, including the effects of climate change. Flood Zone 3 are areas with more than a 1% (1 in 100) chance of flooding, including the effects of climate change. The NRW map shows some properties on the site fall within these zones.

[3] https://flood-map-for-planning.naturalresources.wales/

2.9 The flood risk shown on the NRW 'Flood Risk from Surface Water and Small Watercourses' map (Figure 5) is derived from a modelling study using inputs such as rainfall and LiDAR data. The mapping identifies areas where surface water may flow or pool during heavy rainfall. The NRW map does not consider factors such as drainage systems, culverts, blockages and recent changes in land levels by developments.

2.10 NRW mapping suggests that once flood flows exceed the capacity of the channels, they would continue flowing north along the western edge of the channel and over Ffordd Dewi Road.

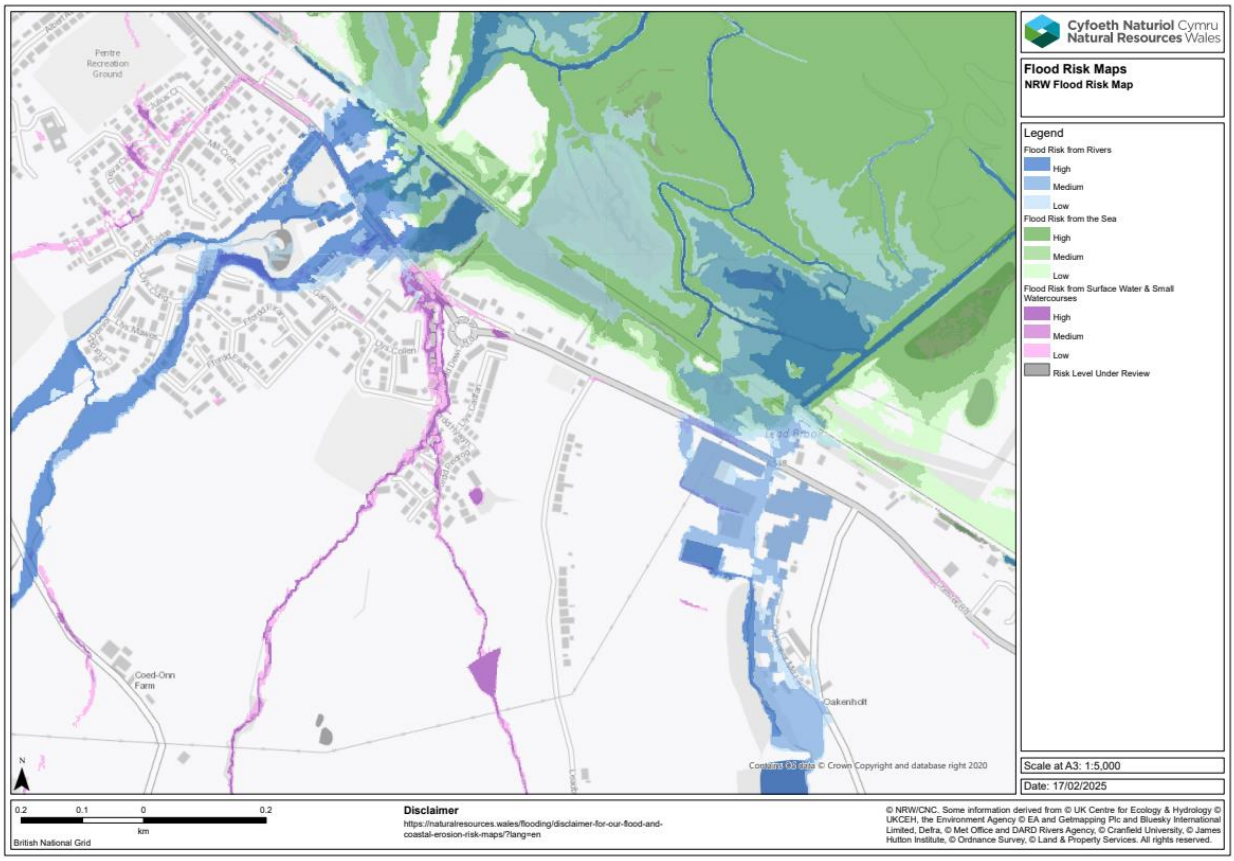


Figure 5 – NRW Flood and Coastal Erosion Risk Map

Ground water

2.11 In December 2024 groundwater levels in the North Wales gauge 'Llanfair D.C' were reported by the UK Centre For Ecology and Hydrology (UKCEH)[4] as being 'notably high' compared to historical records. By the end of January 2025 groundwater levels in the same gauge had become 'Exceptionally high', with a record all time high also being set in nearby Shropshire. Given this understanding of the general ground conditions in North Wales, the groundwater in Oakenholt was likely higher than normal for the time of year which may have led to more runoff than normal during the rainfall event.

[4] https://nrfa.ceh.ac.uk/monthly-hydrological-summary-uk

Previous flooding history

2.12 Before the recent development of houses, a local resident reported seeing the fields flooded on a number of occasions. The A548 (Chester Road) is also known to have flooded around 'Culvert 1' and the adjoining ditch on Figure 4 on occasion.

2.13 The only previous incident of external flooding which was reported by some residents during the community engagement exercise was during Storm Darragh which was between the 5th and 9th December 2024. During this event, residents reported this flooding was the result of the open section of watercourse overtopping around the inlet of 'Culvert 2' on Figure 4. This event was not reported to the LLFA at the time. During the community engagement exercise, a resident reported that it had been reported after the event to the management company within the development.

2.14 The Lead Local Flood Authority (LLFA) holds no records relating to any previous internal flooding incidents within the study area. No previous internal flooding incidents were reported by residents to the LLFA.

2.15 According to NRWs Northop rain gauge, approximately 29.4mm of precipitation fell during Storm Darragh over 3 days.

3.0 Summary of this Weather Event and Impact

National Context

3.1 On the 5th of January 2025, a low pressure weather system centred around the south-west of the UK brought snow and heavy rainfall to several parts of the UK. As shown in Figure 6, most of the UK received over 30mm of rainfall with parts of North Wales receiving between 20mm and 50mm. For the North-east of the UK, this rainfall equalled more than 90% of the expected rainfall for January with some areas recording their wettest ever January day since records began. This weather system led to several flooding problems across the UK most notably within Leicestershire and Lincolnshire. According to the environment agency approximately 800 homes were flooded because of this weather.

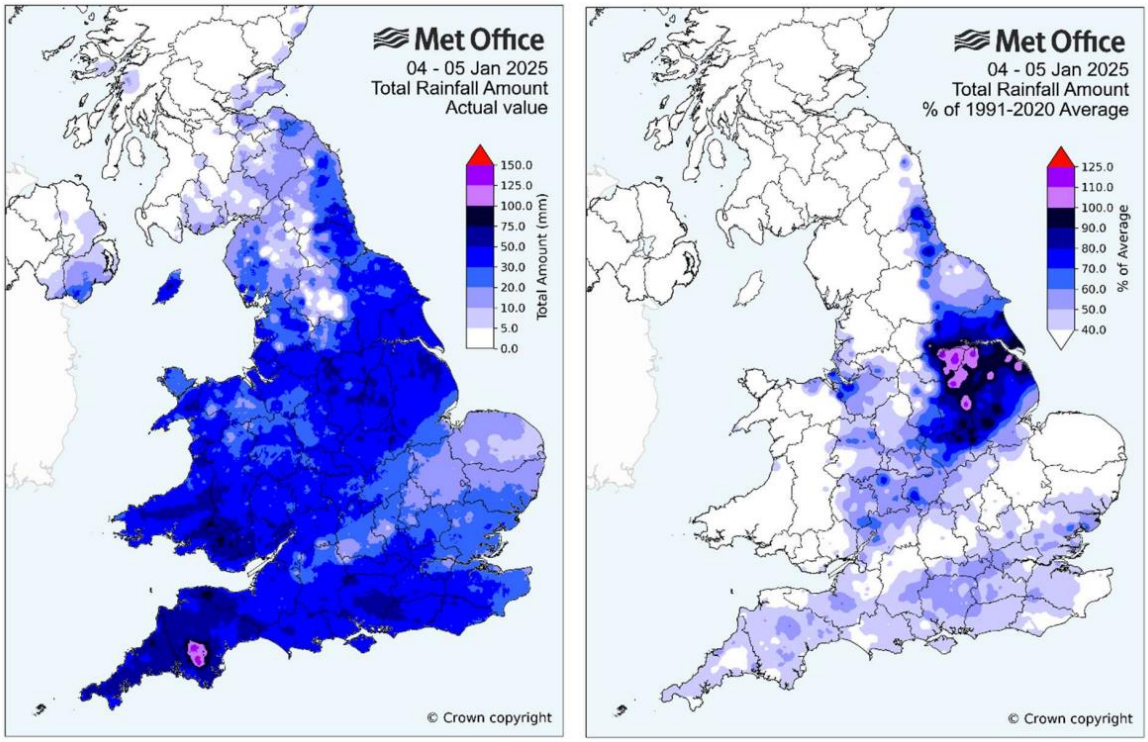


Figure 6 - Met Office Accumulated Daily Rainfall 4th – 5th January 2025[5]

Regional Context

3.2 The observed weather system was part of several other weather events which had been occurring between Late December 2024 and Early January 2025. According to Natural Resources Wales (NRWs) rain gauge in Northop, approximately 60.8mm of precipitation (snow and rain) fell intermittently between the 17th of December to the 3rd of January in the days leading up to the 5th of January. This level of antecedent snow and rainfall along with low evapotranspiration rates due to the time of year would have likely meant the soils as described in Section 2.3 were already saturated prior to the 5th and 6th of January rainfall event.

3.3 Precipitation records have been obtained from NRW's Northop rain gauge[6].

[5] https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/weather/learn-about/uk-past-events/interesting/2025/2025_01_wind_rain_snow.pdf
[6] https://rivers-and-seas.naturalresources.wales/Station/1013?parameterType=2

3.4 Figure 7 shows the precipitation which fell on the 5 days leading up to the 5th January based on Northop rain gauge.

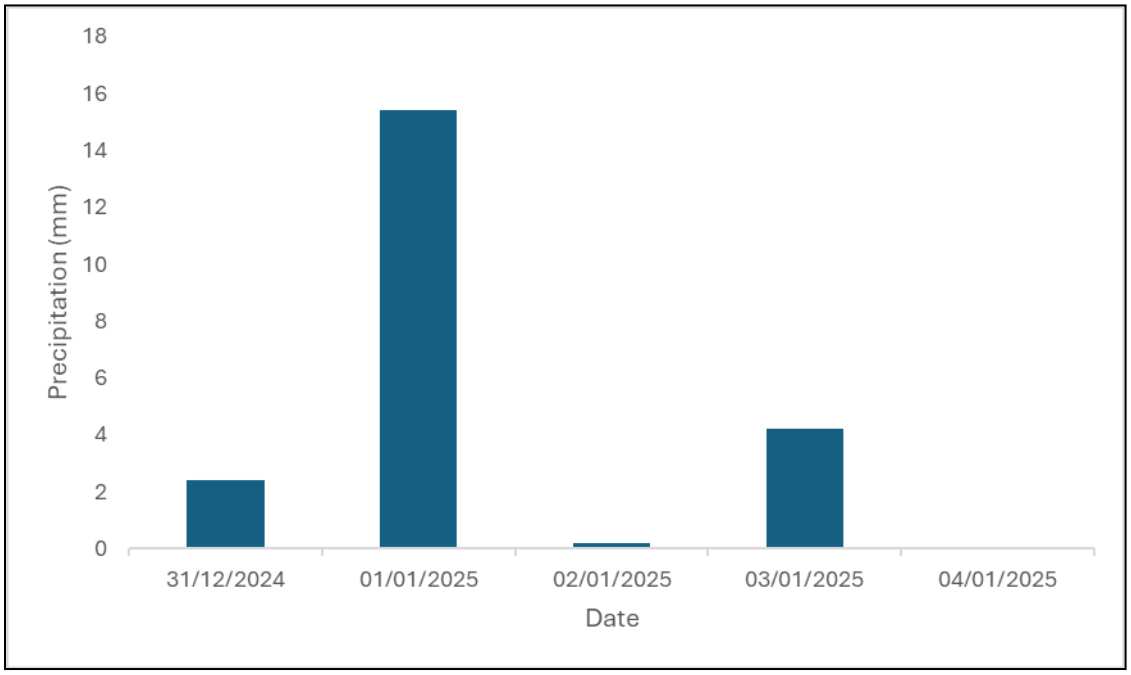


Figure 7 - NRWs Northop Rain Gauge recordings of the days leading to the 5th

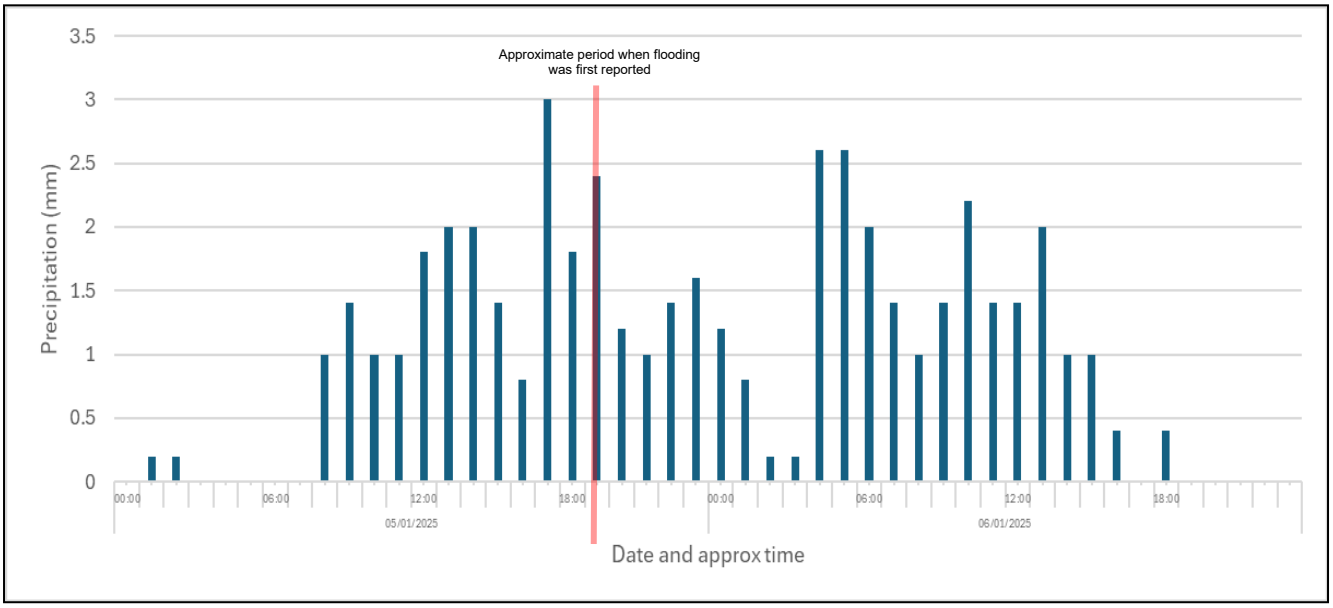


Figure 8 - Hourly rainfall between the 5th and 6th January 2025

3.5 Figure 8 shows that approximately 47.2mm of rainfall fell over 32 hours when the flooding event occurred, peaking at 3mm between 17:00 and 18:00 on the 5th January.

3.6 Flood Estimation Handbook (FEH) analysis suggests that this rainfall is equivalent to an Annual Exceedance Probability (AEP) of approximately 25%. This means the rainfall experienced had a probability of approximately 25% of occurring in any given year.

3.7 Tide data has been obtained from the Liverpool Tidal Gauge[7] (Closest to Oakenholt). Rainfall during this flooding event was highest between 5pm and 6pm on the 5th January whilst high tide was just before 4pm as indicated by Figure 9. Waters levels in this watercourse may become elevated during periods of high tides, as flows may be restricted by high water levels in the River Dee.

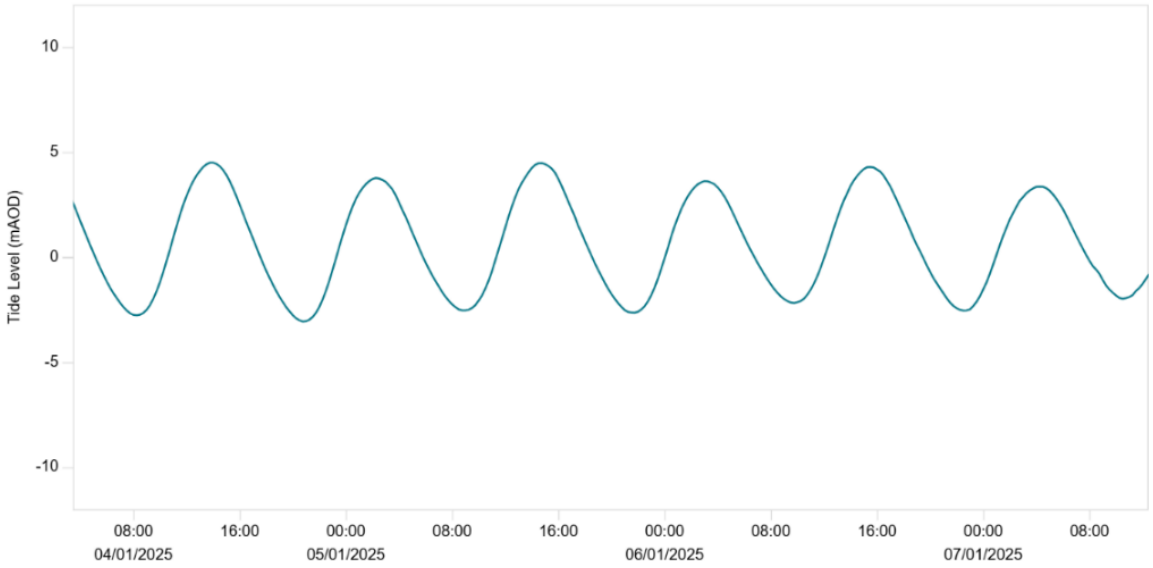


Figure 9 – Liverpool Tidal Gauge data

Local Context

3.8 Community Engagement was undertaken by Flintshire County Councils' Lead Local Flood Authority team at Ffordd Dewi, Oakenholt on the 6th January 2025. The purpose of the community engagement exercise was to gather information on the number of properties affected and their experience of flooding. In addition to speaking with householders, a questionnaire was posted to seek additional feedback. Table 2 shows a summary of the number of responses received.

Table 2 - Summary of Community Engagement which was undertaken in Ffordd Dewi, Oakenholt

Location	Verbal responses received (properties)	Number of postal / email responses
Ffordd Dewi	2	3

3.9 In addition to the community engagement exercise, a number of stakeholders were consulted regarding any information on flooding in Ffordd Dewi. Communications with relevant stakeholders are set out in the communications register in Section 5.

3.10 Table 3 provides a summary of the locations and reported effects of flooding following the community engagement exercise and stakeholder engagement.

[7] https://rivers-and-seas.naturalresources.wales/Station/70139?

Table 3 - Summary of Flooding in Ffordd Dewi, Oakenholt between the 5th – 6th January

Location	Internal Flooding	Impact
Ffordd Dewi	3	3 homeowners directly confirmed internal flooding with the LLFA.
Ffordd Dewi	5	5 further properties internally flooded based on gathered information and 1 further property only externally affected.
Total Internal Flooding	**8***	**Number of internal flooding incidents based on community engagement exercises and stakeholder engagement. Flooding to additional properties may have occurred but not reported to FCC.**

*3 homeowners directly confirmed internal flooding with the LLFA but based on community engagement the LLFA believes a total of 8 properties were internally flooded and 1 further property experienced external flooding to front and rear gardens based on communications with stakeholders.

4.0 Flood Event 5th-6th January 2025

Flood Description

4.1 Following a period of intense rainfall, water levels rose in the local ordinary watercourse known as Croes Onn stream, which exceeded capacity and floodwater spread out into its natural floodplain.

4.2 **19:34 05/01/25** – Approximate time first instance of internal flooding in Ffordd Dewi Oakenholt was reported to North Wales Fire and Rescue Service.

4.3 **19:30 05/01/25 – 03:00 06/01/25** approximate time based on reports when floodwaters were reported at their peak level.

4.4 The maximum recorded internal flood depths were reported to be approximately 25mm by one resident but this may have ranged between houses due to different land levels. Flood water was reported to enter homes through their front and rear doors as well as through air bricks.

4.5 Floodwater followed local topography along Ffordd Dewi road, flooding the adjacent properties rather than going back into the open section of watercourse as suggested by NRWs Flood Risk Map. This is likely due to one of the variables not considered by NRWs map. The general flood location is identified in Appendix C.

4.6 **14:42 06/01/25** - North Wales Fire and Rescue declared a stop to the incident.

4.7 The floodwater was reported to have contained some foul / sewerage materials.

Flooding Mechanisms

4.8 Based on the evidence gathered during the stakeholder engagement exercise, the internal flooding to properties along Ffordd Dewi is attributed to heavy rainfall leading to an increased flow in the watercourse, a high flood risk fluvial system known as the Croes Onn stream.

4.9 **Primary Flooding Mechanism:** Fluvial & Surface Water associated with the ordinary watercourse Croes Onn stream.

4.10 **Secondary Flooding Mechanism:** Foul water

4.11 During the stakeholder engagement exercise, multiple sources reported that a blockage in the form of a wooden plank and debris/foliage had formed in the high flood risk fluvial system known as the Croes Onn stream at the in-let of ‘Culvert 2’, blockage of any culvert reduces its capacity to pass forward flows and could have exacerbated upstream water levels.

4.12 It is unknown how the wooden debris originally got into the channel and how long it had been there, but this debris may have acted to accumulate further debris such as debris/foliage to form a larger blockage over time. Following any storm event silt and debris can accumulate in culverts, washed down by fast flowing floodwater.

Initial RMA response to 5th – 6th Flooding Event

4.13 **19:43 05/01/25** At approximately 19:43 on the 5th of January, the Fire and Rescue service attended a report of a property internally flooding at Ffordd Dewi Oakenholt, and provided a description of the incident to the control room.

4.14 **20:30 05/01/25** The Fire Service began pumping water to divert floodwater away from properties along Ffordd Dewi Road into 2 highway gullies and later downstream into the ditch at the outfall of 'Culvert 1'. During the incident, North Wales Fire and Rescue Service recorded that there was a potential blockage in 'Culvert 2'. North Wales Fire and Rescue communicated to the LLFA that they believed there was a blockage because they witnessed limited floodwater exiting the downstream end of 'Culvert 2' when in attendance. It was unknown who the responsible owner(s) of the culvert was.

4.15 Despite these actions, floodwater followed local topography along Ffordd Dewi road, flooding the adjacent properties rather than going back into the open section of watercourse as suggested by NRWs Flood Risk Map. This is likely due to one of the variables not considered by NRWs map. The general flood location is identified in Appendix C.

4.16 **Morning of 06/01/25** On the morning of the 6th of January, North Wales Police (NWP) and Streetscene operatives began attending with NWP closing 1 side of Chester Rd to allow for further pumping. Streetscene also provided sandbags to redirect flood flows.

4.17 On the 6th of January, contractors employed by Streetscene arrived and began using a high-volume jet to clear debris and silt in 'Culvert 2' which is indicated on Figure 4, starting from the downstream headwall and working upstream through the culvert. This was reported to have achieved a small increase in flow through the culvert which allowed the upstream section of the Croes Onn watercourse to partly drain. This partial drain allowed contractors to begin clearing around headwall and in-let of 'Culvert 2' where a wooden board and other debris such as foliage were removed; confirming North Wales Fire and Rescue Services previous observations. Upon removing these blockages, witnesses reported seeing a sudden release of water through 'Culvert 2'.

4.18 Residents also reported seeing foul water in the area and their homes. The cause of this was reported to be the result of flood flows spilling from the watercourse and entering the foul sewer system through drain covers outside the properties, causing the system to back up. Dŵr Cymru Welsh Water visited during the incident to check assets and confirmed in email correspondence that their systems were operating at full bore due to the inflow of floodwater.

4.19 The Fire Service reportedly used their hoses to wash silt downstream from the in-let of 'Culvert 2' and adjacent upstream ditch whilst waiting for water levels to recede and then declared a stop to the incident at 14:42 on the 6th January 2025.

Post Flood Response undertaken by Risk Management Authorities

4.20 Following the flood event, the following actions have been undertaken by Risk Management Authorities (RMAs):

Table 4 – Further actions undertaken

RMAs	Action undertaken
Natural Resources Wales	N/A [Not main river]
Dŵr Cymru Welsh Water	DCWW confirmed they visited the site on the day of flooding to inspect their assets. No further actions post flood event have been undertaken.
Lead Local Flood Authority	1. Met with local stakeholders on the 5th February. 2. Site visit and door knocking exercise undertaken with residents on the 6th February with further calls and emails conducted. 3. Meeting with Anwyl Homes and Streetscene representatives on the 5th March. 4. Undertook a S19 investigation. 5. Contacted downstream landowners to desilt sections of the watercourse to help improve the general flow of the system (See photos in Appendix D). 6. On site meeting with the Fire Services incident commander on the 11th March.
Highways Authority (Flintshire County Council)	1. Met with the LLFA to discuss incident 2. Reviewed Section 38 agreements

5 Relevant Parties Communication Register

5.1 The table below provides the details of communications that have taken place with relevant parties up to the time of writing this report. Relevant parties are considered to be all authorities and stakeholders directly involved and responsible for flood risk management, property owners affected by the flood event, and all parties who may be able to provide information salient to the flood investigation.

Table 5 - Relevant Parties Communications Register

Contact	Communications
Local Residents	Community door knocking exercise, telephone calls, emails, questionnaire drop.
Flintshire County Council (FCC) as the Highways Authority	Email exchange with Highways Officers.
Streetscene Operatives	Email exchange and meeting with officers.
Dŵr Cymru Welsh Water	Email exchange
Streetscene contractors employed to clear culvert	Email exchange
North Wales Fire and Rescue Incident Commander	Email exchange, telephone call, site walkover
Anwyl Homes	Email exchange and meeting.
Management Company	Email exchange

6.0 Conclusions

6.1 The Lead Local Flood Authority in accordance with the Flood and Water Management Act 2010 has carried out a Section 19 investigation for the flood event in Ffordd Dewi which occurred between the 5th and 6th of January 2025.

6.2 47.2mm of rainfall was experienced over 32hours between these two days and high levels of snow and rainfall prior to the event meant groundwater levels may have been high and soils saturated/frozen which leads to faster and increased runoff rates.

6.3 8 properties were reported to have experienced internal flooding with a further 1 property experiencing external flooding only, all adjacent to Ffordd Dewi Road. The source of flooding was cited to be from the ordinary watercourse overspilling at the in-let of one of the culverts which flows beneath Ffordd Dewi road.

6.4 Based on the evidence gathered during the stakeholder engagement exercise, the internal flooding to properties along Ffordd Dewi is attributed to heavy rainfall leading to an increased flow in the watercourse, a high flood risk fluvial system known as the Croes Onn stream.

6.5 During the stakeholder engagement exercise, multiple sources reported that a blockage in the form of a wooden plank and debris/foliage had formed in the high flood risk fluvial system known as the Croes Onn stream at the in-let of 'Culvert 2' (Figure 4), blockage of any culvert reduces its capacity to pass forward flows and could have exacerbated upstream water levels.

6.6 It is unknown how the wooden debris originally got into the channel and how long it had been there, but this debris may have acted to accumulate further debris such as debris/foliage to form a larger blockage over time. Following any storm event silt and debris can accumulate in culverts, washed down by fast flowing floodwater.

6.7 It is the responsibility of the riparian or asset owner to maintain the free flow of water along any watercourse, including through culverts, without obstruction, pollution or diversion. Further details of riparian ownership are detailed on the NRW webpage: www.naturalresources.wales/flooding/owning-a-watercourse

6.8 Residents also reported seeing foul water in their homes. This is likely the result of water entering their drainage systems through drain covers and causing backflow.

7.0 Recommendations

7.1 Table 6 sets out the recommended actions following the flooding of Ffordd Dewi, Oakenholt on the 5th and 6th January 2025 and the stakeholder recommended to undertake them.

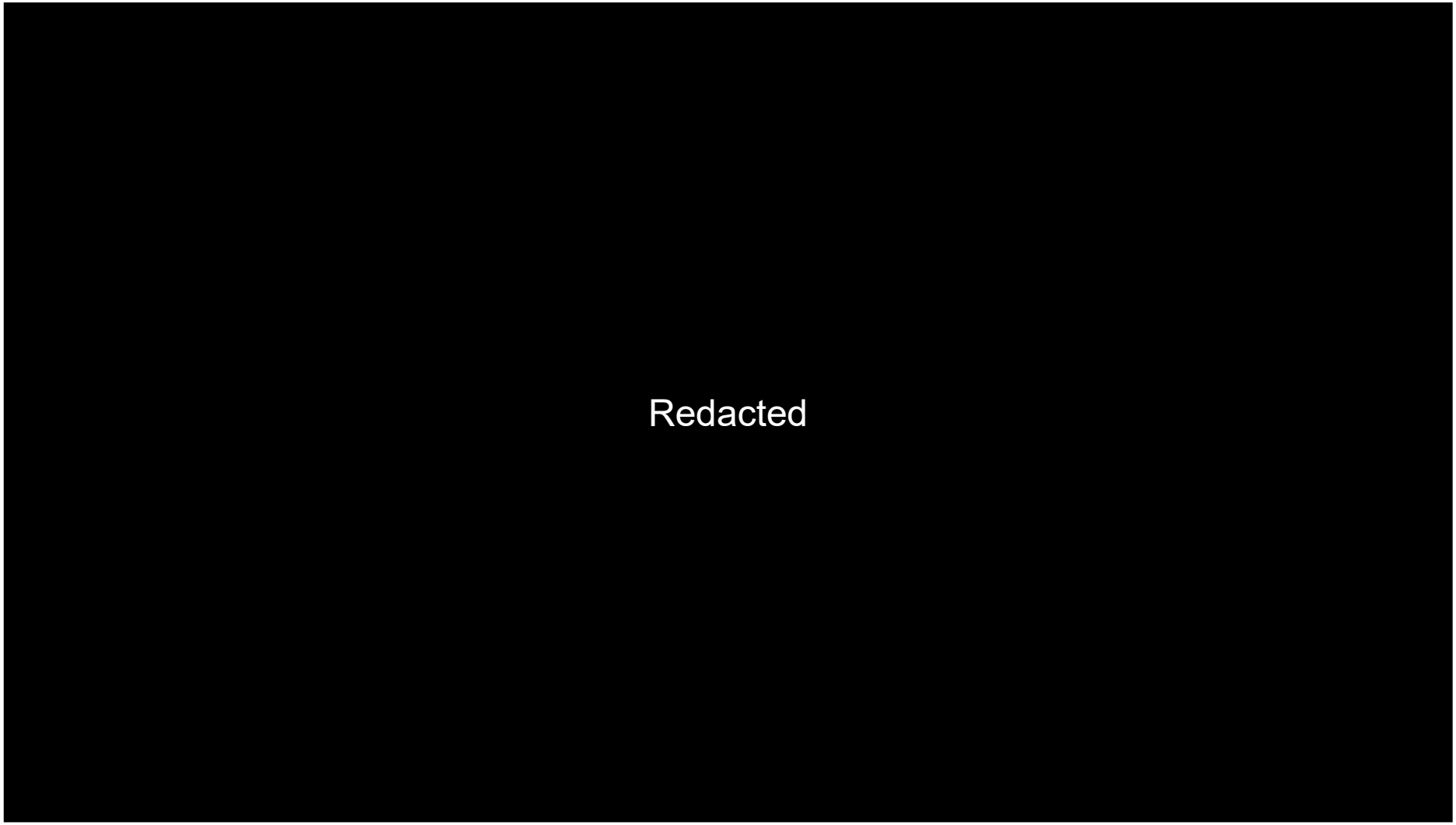
Table 6 - Recommendations

Ref	Stakeholder	Recommended action	Current Progress
01	Lead Local Flood Authority	Identify the parties responsible for the ongoing maintenance of the culverts 1-4 identified on Figure 4 and communicate this with all interested parties to allow future issues to be reported and resolved.	Culvert 1: FCC (as Highways Authority) Culvert 2: Anwyl Homes Culvert 3: Anwyl Homes Culvert 4: Anwyl Homes To be communicated formally on publication
02	Riparian Owner(s)	Review the maintenance regimes of the ordinary watercourse systems on site (*both open watercourse and culverts).* ***(www.naturalresources.wales/flooding/owning-a-watercourse)***	Ongoing
03	Lead Local Flood Authority	Contact landowners downstream to desilt open watercourse downstream of 'Culvert 1' outfall.	Completed on 05.03.25 [See photograph log]
04	Anwyl Homes (Riparian Owner)	Continue working collaboratively on the land drainage and future SuDs for any further development of estate and undertake early engagement exercises for any new planning applications.	Ongoing
05	Anwyl Homes and Management Company (Riparian Owner)	Continue reviewing management boundaries and assets, clearly communicating with and updating residents and relevant authorities where appropriate.	Ongoing
06	Highways Authority (FCC)	Review the condition of 'Culvert 1' on Figure 4 and maintain accordingly	Completed (culvert desilted)
07	Residents	Consider forming a Flood Action Group to help prepare and manage future flood events.	N/A

08	Residents	Consider implementing property level flood protection measures (i.e air brick covers, flood gates/doors).	https://thefloodhub.co.uk/pfr/
09	Riparian Owner(s) / Local Community	Be vigilant to littering and fly tipping into watercourse.	N/A

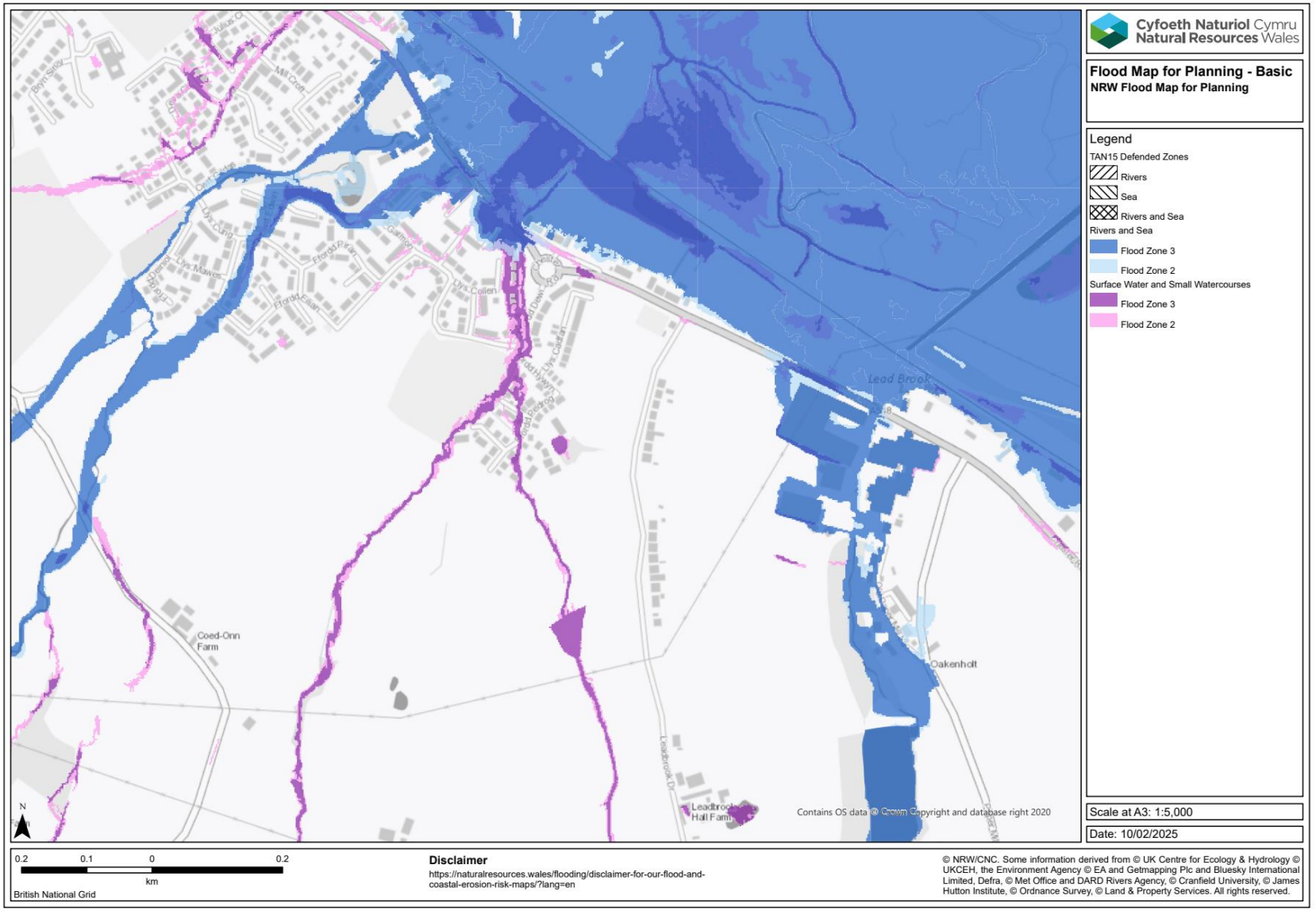
APPENDIX A

DCWW Sewer Plans



APPENDIX B

NRW Flood Map for Planning



APPENDIX C

Reported Flood Areas

APPENDIX D

Photograph locations

Photographic Record

Photograph no. 1	
Date: 11/03/25	
Description: A picture looking upstream of where the Croes Onn watercourse enters the development. **Arrows indicate flow direction** **Source:** Author	

Photograph no. 2 **Date: 11/03/2025** **Description:** A picture looking upstream of the Croes Onn watercourse opposite the playground. **Source:** Author	

Photograph no. 3 **Date: 11/03/2025** **Description:** A picture looking at the tributary which joins the main Croes Onn stream after going through 'Culvert 4'. **Source:** Author	

Photograph no. 4 **Date: 11/03/2025** **Description:** A picture looking downstream of the Croes Onn stream as it flows towards the in-let of 'Culvert 3'. **Source:** Author	

Photograph no. 5 **Date: 11/03/2025** **Description:** The in-let and headwall of 'Culvert 3'. **Source:** Author	

Photograph no. 6 **Date: 11/03/2025** **Description:** The outfall and headwall of 'Culvert 3'. **Source:** Author	

Photograph no. 7 **Date: 11/03/2025** **Description:** The in-let and headwall of 'Culvert 2'. **Source:** Author	

Photograph no. 8 **Date: 11/03/2025** **Description:** The outfall and headwall of 'Culvert 2'. **Source:** Author	

Photograph no. 9 **Date: 11/03/2025** **Description:** A picture looking downstream at the open section of watercourse between 'Culvert 2' and 'Culvert 1'. **Source:** Author	

Photograph no. 10 **Date: 11/03/2025** **Description:** The in-let and headwall of 'Culvert 1' which flows under the A548. **Source:** Author	

Photograph no. 11 **Date: 11/03/2025** **Description:** A picture looking downstream of the 'Culvert 1' outfall at the desilted watercourse. **Source:** Author	

Photograph no. 12 **Date:** 06/01/2025 **Description:** The in-let and headwall of 'Culvert 2' after pumping but prior to being unblocked. **Source:** Streetscene	

Photograph no. 13 **Date:** 06/01/2025 **Description:** A picture looking upstream at the outfall of 'Culvert 3' demonstrating the water level of the open brook prior to being unblocked. **Source:** Streetscene	

Photograph no. 14 **Date: 06/01/2025** **Description:** The in-let and headwall of 'Culvert 2' a few minutes after the blockage was removed. **Source:** Streetscene	

Photograph no. 15 **Date: 06/01/2025** **Description:** Open section of watercourse after a few minutes once the downstream culvert inlet was unblocked. **Source:** Streetscene