Cyngor Castell-nedd Port Talbot
Neath Port Talbot Council

Adroddiad Ymchwiliad i'r Llifogydd
Investigation Report into Flooding

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Investigation Report into Flooding
Incident of 3rd November 2022
St Catherines Close, Melyn

Neath Port Talbot
Castell-nedd Port Talbot
County Borough Council Cyngor Bwrdeistref Sirol

Highways and Drainage Services

Environment & Regeneration Directorate

Neath Port Talbot County Borough Council

The Quays

Brunel Way

Briton Ferry

Neath

SA11 2GG

Revision Schedule

Version	Prepared by	Reviewed by	Approved by	Date
Rev A	Toby Michaelson-Yeates (Drainage Officer)	Rhianwen Bailey (Drainage Engineer)	-	February 2023
Rev B	Toby Michaelson-Yeates (Drainage Officer)	Richard Colman (Drainage Manager)	-	October 2023
Rev C	Toby Michaelson-Yeates (Drainage Officer)	Richard Colman (Drainage Manager)	Michael Roberts (Head of Streetcare)	December 2023

Contents

1. Introduction

An investigation has been undertaken by Neath Port Talbot Council as Lead Local Flood Authority in response to the flooding that occurred at St Catherine's Close, Melyn on November 3rd, 2022. This report is a summary of the investigation and includes relevant information required to meet the statutory requirements placed on the Authority under Section 19 of The Flood and Water Management Act 2010. Information regarding the duties and responsibilities placed on a Lead Local Flood Authority (LLFA) to investigate flooding can be found in Appendix A.

One of the requirements of Section 19 is that an investigation report must identify which Risk Management Authorities (RMA) have relevant flood risk management functions. Appendix B provides a summary of the roles and responsibilities of the RMA's within Neath Port Talbot.

Through the investigation process, it was determined that the relevant RMA's for the flooding that occurred at St Catherines Close are:

- NPTCBC as Lead Local Flood Authority
- NPTCBC as Highway Authority

The flooding at St Catherines Close, Melyn occurred at approximately 18:00hrs on Thursday 3rd November 2022 as a result of intense rainfall, coupled with a significant blockage of the trash screen at St Catherine's Close intake. Emergency response actions were undertaken by NPTCBC to help reduce the flood risk, however, the efficiency of this response was limited due to the speed at which the water levels rose as well as the additional flood events in the local area that also required NPTCBC resources.

Following investigations of minor flood events at St Catherine's Close in 2020 and 2021 by NPTCBC, it was determined that the existing intake, overflow structure and associated trash screens were unsatisfactory. It was assessed that the overflow structure was positioned too far upstream to work effectively during periods of heavier rainfall. Furthermore, the design of the trash screen was also found to present maintenance constraints and difficulties for clearing when required.

The response of these investigations by NPTCBC was to appoint AMEY Consulting to undertake an extensive review of the intake area with the purpose of re-designing the arrangement of the intake. Amendments and upgrades were completed in the summer of 2022 with a view to improving and enhancing maintenance practices for the NPTCBC highways and drainage team. The aims were to provide a safer arrangements for cleansing the existing structure during prolonged heavy rainfall events as well as reduce the frequency and severity of flooding to properties. Works to the structure also included major repairs to the inner retaining walls and the outer brick wall which were in a poor state of repair plus safety fencing and a gated area to prevent unauthorised access. These improvements did not however include an upsizing of the culvert structures beneath the ground and as such the capacity of the channel and the pipes remained unchanged.

As a result of the November 2022 flooding, NPTCBC are in the process of implementing a number of further short term flood mitigation measures in order to reduce the amount of blockages. These include allowing for improved machine access to clear the culvert in the event of a blockage, alteration to the overflow trash screen, and raising awareness with local residents and businesses about the effects of illegal tipping of materials into the brook from back gardens and industrial sites.

1.1. Location of Flooding

The site is located in Melyn, which is situated between the towns of Neath and Briton Ferry. Melyn is also located approximately 7.5km north of Port Talbot and 12.5km north-east of Swansea. St Catherine's Close is a residential area located within the community of Melyn, approximately 520m east of the River Neath. The River Neath starts as the waters of the Nedd Fechan and Afon Mellte meet at Pontneddfechan then flow down the Vale of Neath towards the sea at Swansea Bay. There are several short, yet significant watercourses that adjoin this river system, their flow punctuated by a multitude of waterfalls.

The 4.85km^2 Cryddan Brook catchment eventually outfalls into the River Neath, via the intake at St Catherine's Close in Melyn. Melyn is within a key area of flood risk as identified in the 2015 Neath Port Talbot County Borough Council (NPTCBC) Flood Risk Management Plan (FRMP) and by Natural Resources Wales (NRW) in their most recent flood risk assessment for Wales.

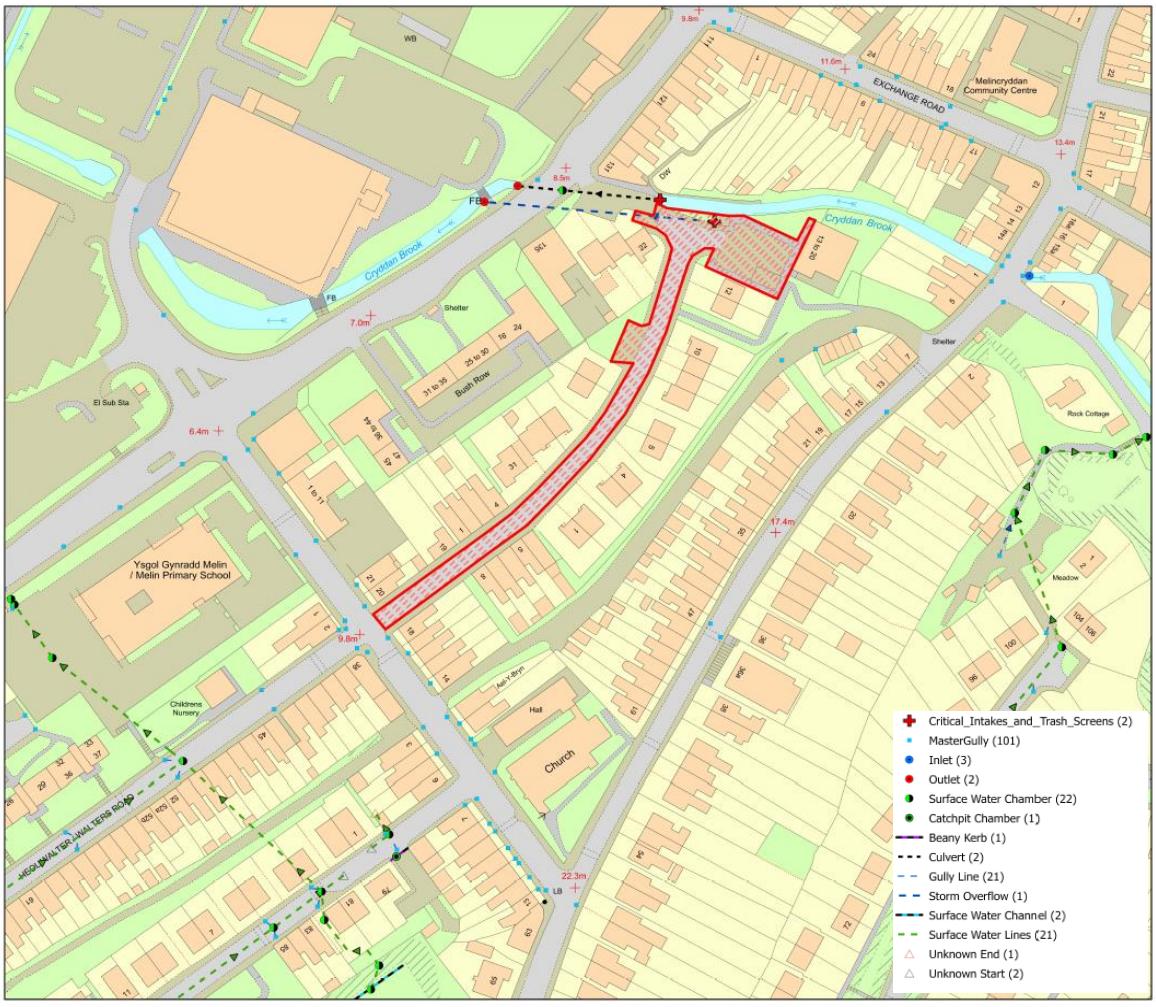

Figure 1 – St Catherine's Close Location Plan and Known Drainage Assets

2. Flood Incident

2.1. Rainfall event and analysis

Between 17:40hrs and 19:00hrs on Thursday 3rd November 2022, Briton Ferry suffered from an intense rainfall event that contributed to a significant overtopping of the St Catherine's Close intake structure and flooding of more than thirty (30) properties in the Melyn/Cryddan area. The flood waters first entered properties between 19:00hrs and 20:00hrs with flooding continuing for several hours after and into the evening.

The investigation highlighted that a significant accumulation of debris, coupled with varying levels of siltation build-up, contributed to the eventual obstruction of the intake at St Catherine's Close. Blockages at this culvert are primarily influenced by the upstream catchment flowing through Eaglebush Valley, a large wooded area which accumulates natural debris as water travels towards the intake at St Catherine's Close. A combination of natural coarse debris, including a tree log as well as general debris such as branches and foliage was present during subsequent cleansing. Additionally, unnatural material in the form of a large fly-tipped carpet was discovered at the intake. These materials became trapped and proved too large to penetrate through the trash screen and were considered key contributing factors to the blockage.

Historically, flooding at St Catherine's Close has been caused by a combination of culvert incapacity and continued blockage of the trash screen. This causes the water level to rise rapidly, leading to overtopping of the structure and flooding to the immediate area and adjacent properties.

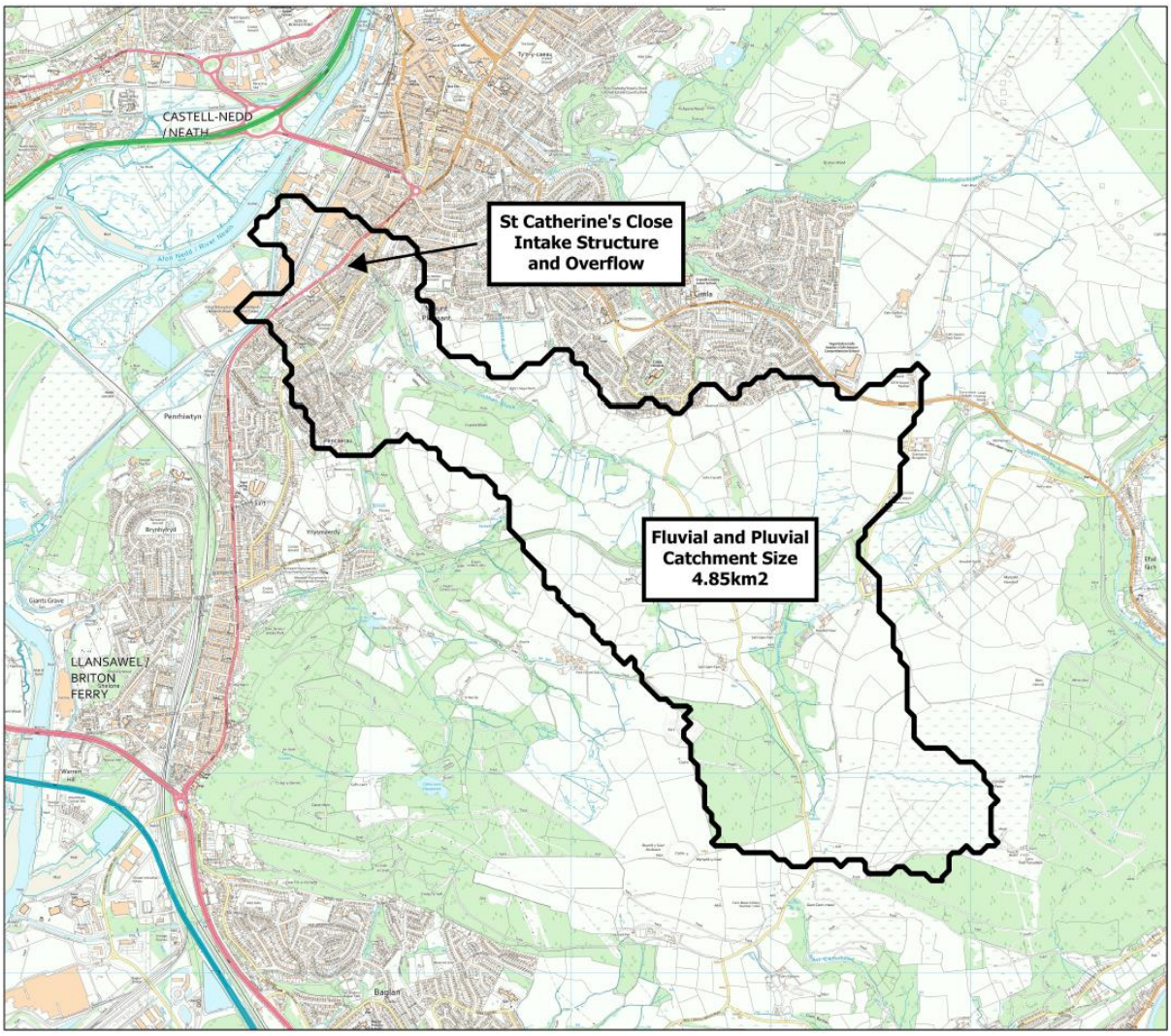

Figure 2 – Cryddan Brook catchment area with location of St Catherine's Close Intake Structure.

Figure 2 depicts the Cryddan Brook catchment area, highlighting the extent of the ~ 4.85km^2 catchment, starting at the Gelli-Gaer Brook towards the outfall into the River Neath. From this map, it can be observed that the single intake at St Catherine's Close accommodates for a vast catchment area and large watercourse.

From previous investigations and knowledge of the environment upstream of St Catherine's Close, it is evident that the intake receives a large amount of natural, coarse debris, much of which is sufficiently small to pass through the trash screen situated at the culvert. However, some of the debris that accumulates with the flow of the brook is too large and cannot pass through effectively. It would be appropriate to summarise that the flood event on November 3rd 2022 was mainly caused by a significant blockage, influenced by large debris transported downstream.

WEDNESDAY **THURSDAY**

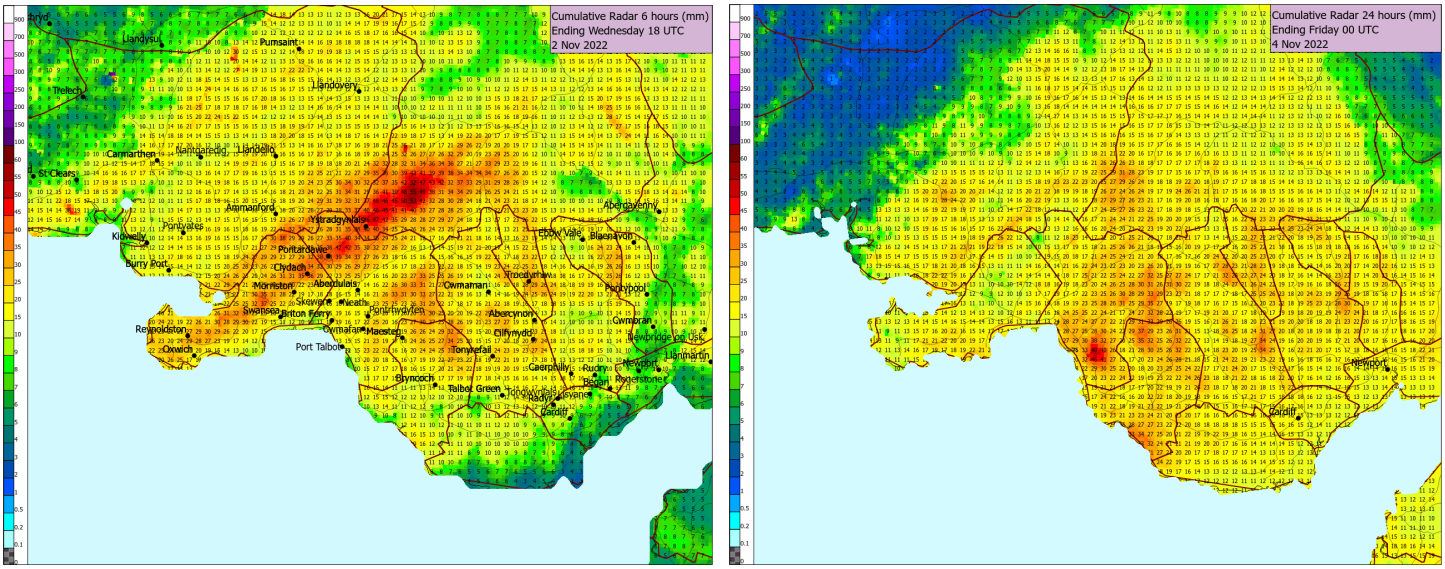

Figure 3 – Cumulative rainfall in NPT for Wednesday 2nd November (6hr) & Thursday 3rd November 2022 (24hr), Metdesk 2022.

Figure 3 depicts the special distribution of rainfall (cumulative values) across Neath Port Talbot and neighbouring authorities. The first graphic (left) depicts the cumulative rainfall over a six hour period for Wednesday 2nd November. During that afternoon, the Swansea Valley area experienced heavy precipitation of approximately 30-50mm over a three hour period from 15:00hrs to 18:00hrs. The county borough received little rainfall preceding and succeeding this window of three hours.

The second graphic displays cumulative rainfall over the twenty-four hour period spanning Thursday 3rd November 00:00hrs to Friday 4th November 00:00hrs. This covers the period of heavy rain which led to the localised flooding at St Catherine's Close, among other regions neighbouring Briton Ferry and Neath. Figure 3 illustrates the quantity of rainfall which fell over the thirty-six hour period that coincided with the blockage and resulting flood event.

The data in figure 4 overleaf presents rainfall values for the Cryddan catchment from 00:00hrs 02/11/22 to 00:00hrs 03/11/22 and 00:00hrs 03/11/22 to 00:00hrs 04/11/22.

A summary of the rainfall analysis for November 2nd 2022:

- Rainfall from 15:00hrs to 16:00hrs was in the range of 3.9mm/hr to 5.3mm/hr.
- Rainfall from 16:00hrs to 17:00hrs was in the range of 4.7mm/hr to 7.2mm/hr.
- Rainfall from 17:00hrs to 18:00hrs was in the range of 4.3mm/hr to 5.1mm/hr.
- 24hr rainfall recorded between 00:00hrs November 2nd and 00:00hrs November 3rd was in the range 16.0mm to 18.9mm.

A summary of the rainfall analysis for November 3rd 2022:

- Rainfall from 17:00hrs to 18:00hrs was in the range of 3.2mm/hr to 9.9mm/hr.
- Rainfall recorded between 18:00hrs and 19:00hrs was in the range 4.7mm/hr to 8.3mm/hr.
- 24h rainfall recorded between 00:00hrs November 3rd and 00:00hrs November 4th was in the range 19.4mm to 27.5mm.

Search	5d	5d Clim	24h	SMI	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	00
Asset - Cryddan (Inlet Cryddan Brook)	84.1	18.0	18.5	1.3	0.1	0.2	0.0	0.2	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.3	0.9	5.2	6.1	4.4	0.3	0.2	0.2	0.1	0.0	0.0	0.0
Asset - Cryddan (Inlet Eaglebush)	83.1	18.4	18.7	1.3	0.1	0.2	0.0	0.2	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.2	0.9	5.0	6.5	4.5	0.4	0.1	0.2	0.2	0.0	0.0	0.0
Sector 01 - Cryddan	82.0	22.5	17.4	1.3	0.5	0.0	0.1	0.1	0.2	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	1.0	4.5	4.7	5.1	0.6	0.2	0.1	0.1	0.0	0.0	0.0
Sector 02 - Cryddan	79.5	22.5	16.9	1.3	0.5	0.0	0.1	0.1	0.2	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.9	3.9	4.7	5.0	0.9	0.3	0.0	0.1	0.0	0.0	0.0
Sector 03 - Cryddan	75.8	22.1	16.9	1.3	0.2	0.0	0.1	0.1	0.1	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.8	4.4	5.3	4.7	0.5	0.1	0.1	0.2	0.0	0.0	0.0
Sector 04 - Cryddan	72.8	22.4	17.0	1.3	0.3	0.1	0.1	0.1	0.1	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.9	3.9	5.4	4.7	0.8	0.2	0.0	0.2	0.0	0.0	0.0
Sector 05 - Cryddan	84.7	19.6	18.9	1.3	0.0	0.1	0.0	0.1	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.8	4.8	7.2	4.5	0.4	0.1	0.2	0.4	0.0	0.0	0.0
Sector 06 - Cryddan	75.2	21.5	16.7	1.3	0.1	0.1	0.0	0.1	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.9	4.4	5.5	4.4	0.5	0.1	0.1	0.3	0.0	0.0	0.0
Sector 07 - Cryddan	73.0	22.1	16.0	1.3	0.1	0.1	0.1	0.1	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	1.0	4.0	5.0	4.5	0.7	0.1	0.0	0.2	0.0	0.0	0.0
Sector 08 - Cryddan	86.3	17.5	17.9	1.3	0.2	0.2	0.0	0.2	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.3	0.9	5.3	5.4	4.3	0.3	0.2	0.2	0.1	0.0	0.0	0.0
Sector 09 - Cryddan	83.0	18.8	18.9	1.3	0.0	0.2	0.0	0.2	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.2	0.9	4.8	7.0	4.4	0.4	0.1	0.1	0.2	0.0	0.0	0.0

Search	5d	5d Clim	24h	SMI	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	00
Asset - Cryddan (Inlet Cryddan Brook)	96.6	16.8	20.1	1.4	0.1	0.0	0.6	0.3	1.7	2.0	0.6	0.0	0.8	0.0	0.0	0.0	0.1	0.5	1.3	0.3	1.6	3.7	4.9	0.5	0.8	0.0	0.0	-
Asset - Cryddan (Inlet Eaglebush)	95.3	17.2	19.8	1.4	0.1	0.0	0.6	0.3	1.6	1.8	0.6	0.0	0.7	0.0	0.0	0.0	0.1	0.4	1.3	0.3	1.6	3.7	5.2	0.5	0.7	0.0	0.1	-
Sector 01 - Cryddan	98.5	21.0	26.6	1.4	0.5	0.3	1.3	1.4	1.6	1.7	1.3	0.2	0.2	0.0	0.0	0.2	0.2	1.1	1.3	0.3	2.3	6.5	5.3	0.5	0.3	0.0	0.1	-
Sector 02 - Cryddan	92.3	21.1	22.5	1.4	0.4	0.3	1.4	1.6	1.5	1.8	1.4	0.1	0.2	0.0	0.0	0.2	0.1	1.4	1.4	0.3	1.4	3.3	4.7	0.6	0.3	0.0	0.1	-
Sector 03 - Cryddan	93.5	20.6	27.1	1.4	0.2	0.0	0.8	1.0	1.6	1.6	0.8	0.0	0.2	0.0	0.0	0.1	0.2	0.9	1.3	0.2	1.9	7.5	7.6	0.5	0.5	0.0	0.1	-
Sector 04 - Cryddan	90.7	20.9	26.3	1.4	0.2	0.1	0.9	1.3	1.4	1.5	0.9	0.0	0.3	0.0	0.0	0.1	0.2	1.2	1.4	0.1	1.7	7.8	6.2	0.5	0.4	0.0	0.1	-
Sector 05 - Cryddan	99.3	18.4	23.4	1.4	0.1	0.0	0.7	0.4	1.7	1.9	0.6	0.0	0.6	0.0	0.0	0.0	0.1	0.7	1.4	0.3	1.8	4.6	7.3	0.4	0.8	0.0	0.1	-
Sector 06 - Cryddan	91.6	20.1	25.0	1.4	0.1	0.0	0.7	0.6	1.4	1.5	0.5	0.0	0.5	0.0	0.0	0.0	0.1	0.8	1.1	0.2	1.7	6.2	8.3	0.4	0.6	0.0	0.1	-
Sector 07 - Cryddan	92.0	20.6	27.5	1.4	0.1	0.0	0.7	0.9	1.3	1.3	0.6	0.0	0.5	0.0	0.0	0.1	0.1	0.9	1.1	0.1	2.2	9.9	6.7	0.5	0.3	0.0	0.1	-
Sector 08 - Cryddan	99.1	16.4	20.6	1.4	0.1	0.0	0.6	0.3	1.8	2.2	0.6	0.0	0.8	0.0	0.0	0.1	0.1	0.6	1.4	0.2	1.5	3.8	4.8	0.4	1.0	0.0	0.0	-
Sector 09 - Cryddan	94.9	17.6	19.4	1.4	0.1	0.0	0.6	0.3	1.6	1.7	0.5	0.0	0.7	0.0	0.0	0.0	0.1	0.4	1.2	0.3	1.7	3.2	5.5	0.5	0.6	0.0	0.1	-

Figure 4 – Rainfall data for Cryddan catchment - Wednesday 2nd November and Thursday 3rd November.

Figure 4 illustrates the severity of the rainfall event and how quickly a large quantity of rainfall can fall over a very short period. The data suggests there was a small downpour experienced between 05:00hrs and 07:00hrs in the Cryddan catchment area. The region then received very little/no rainfall for the rest of the day until the significant downpour starting at 17:00hrs.

Throughout late Thursday afternoon and into the evening, the authority responded to a number of flood related calls across the borough, which the emergency 'out of hours' staff responded to. Residents of St Catherine's Close did not have ample time to retrieve flood defence sandbags, which were kept along a paved path area adjacent to 26 St Catherine's Close and due to the speed at which the St Catherine's Close intake overflowed, the first floodwaters entered properties at roughly 19:15hrs. The first property to experience flooding was 21 St Catherine's Close, situated nearest to the culvert at the end of a row of terraced houses.

It is important to note that floodwater continued to overtop during a period of approximately two hours. Flows travelled west to Briton Ferry road A474 and followed the slope of the road south towards the Esso garage. Flood water also travelled over the impermeable road at St Catherine's Close towards the Vintage 7 Antique Centre, collapsing a stone wall that had been standing since the late 1800s. A photograph of the collapse can be seen in figure 5 overleaf. This collapse resulted in the flooding of both the outside open-area of the Vintage 7 Antique Centre, and ground-floor public house situated within the property. Efforts to fully clean St Catherine's Close carried on through the night until the daylight hours of Friday 4th November.

Figure 5 – Collapsed stone wall outside Vintage 7 Antique Centre.

2.2. Flood extent

More than thirty (30) properties suffered varying degrees of internal flooding on 3rd November in Melyn, including twelve (12) on St Catherine's Close. Figure 6 below illustrates the main flood location and the properties impacted on St Catherine's Close.

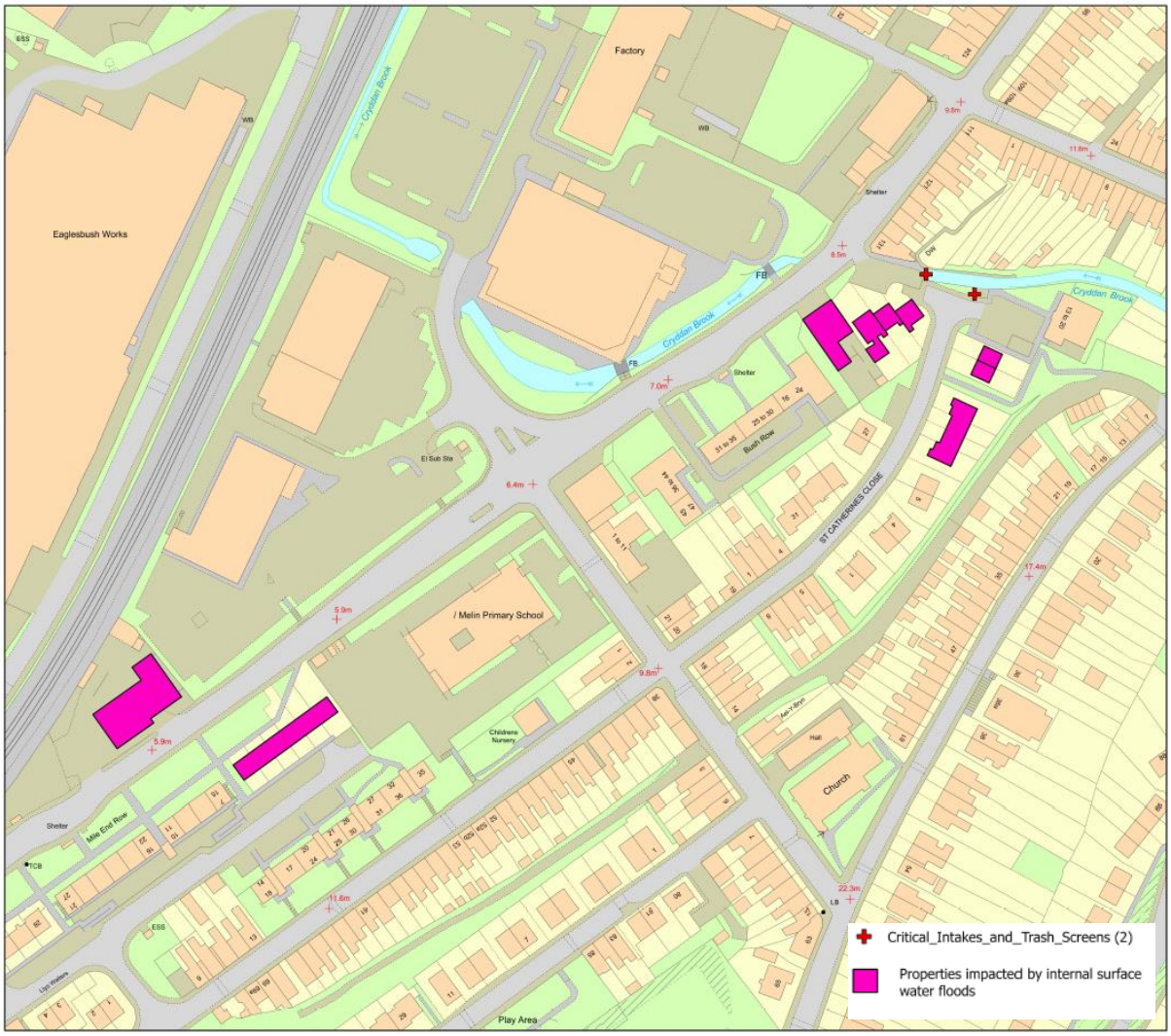

Figure 6 – Properties affected by the 3rd November 2022 flood event.

2.3. Site characteristics

The land upstream of the St Catherine's Close intake structure is dominated by ancient semi-natural woodland (Eaglebush Valley). As a result, the hydrological cycle is heavily influenced by existing, natural land cover. Historically, the Melyn/Cryddan area had been undisturbed woodland with a naturally regulated hydrological cycle. This provided the area with a great resilience to flood risk.

In this post-industrialised era, the introduction of rapid urban development has increased the amount of impermeable surfaces across Wales. The introduction of these impermeable surfaces has significantly altered the natural hydrological processes of previously undisturbed catchments. Furthermore, trees were felled to make way for grazing land which has impacted the hydrological cycle and accelerated surface water runoff. During rainfall events, surface water cannot percolate through impermeable surfaces such as tarmac roads, so is therefore forced to flow upon that surface until it either reaches an urban drainage system, such as a gully network, or an area with permeable land cover such as soils or Sustainable Urban Drainage Systems (SuDs).

2.4. Drainage networks and flood paths

Figures 7 and 8 identify surface water, land drainage and DCWW networks in the vicinity of the flooding incident, as identified in the corresponding legends.

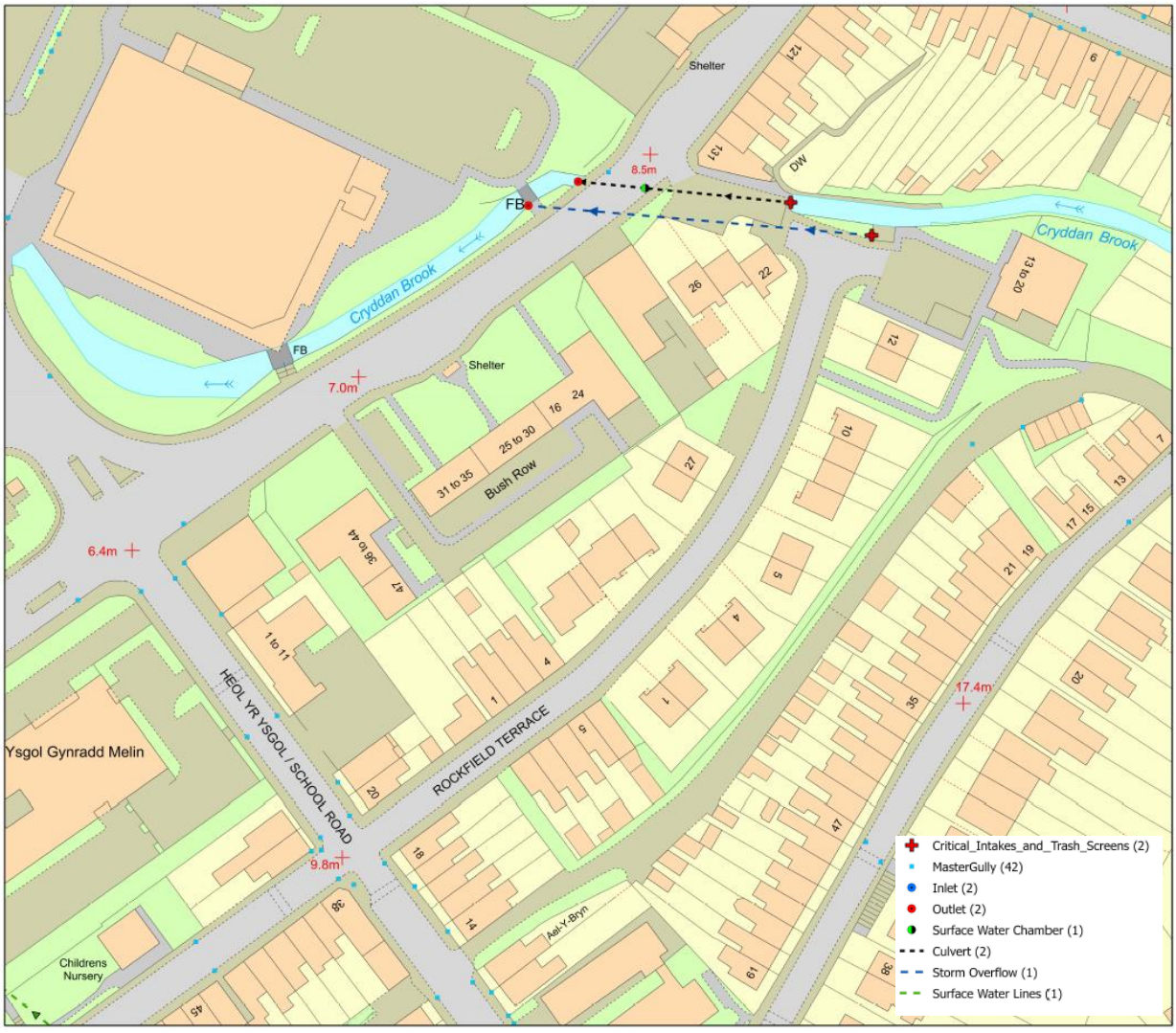

Figure 7 - Map identifying the surface water drainage infrastructure in the St Catherine's Close area.

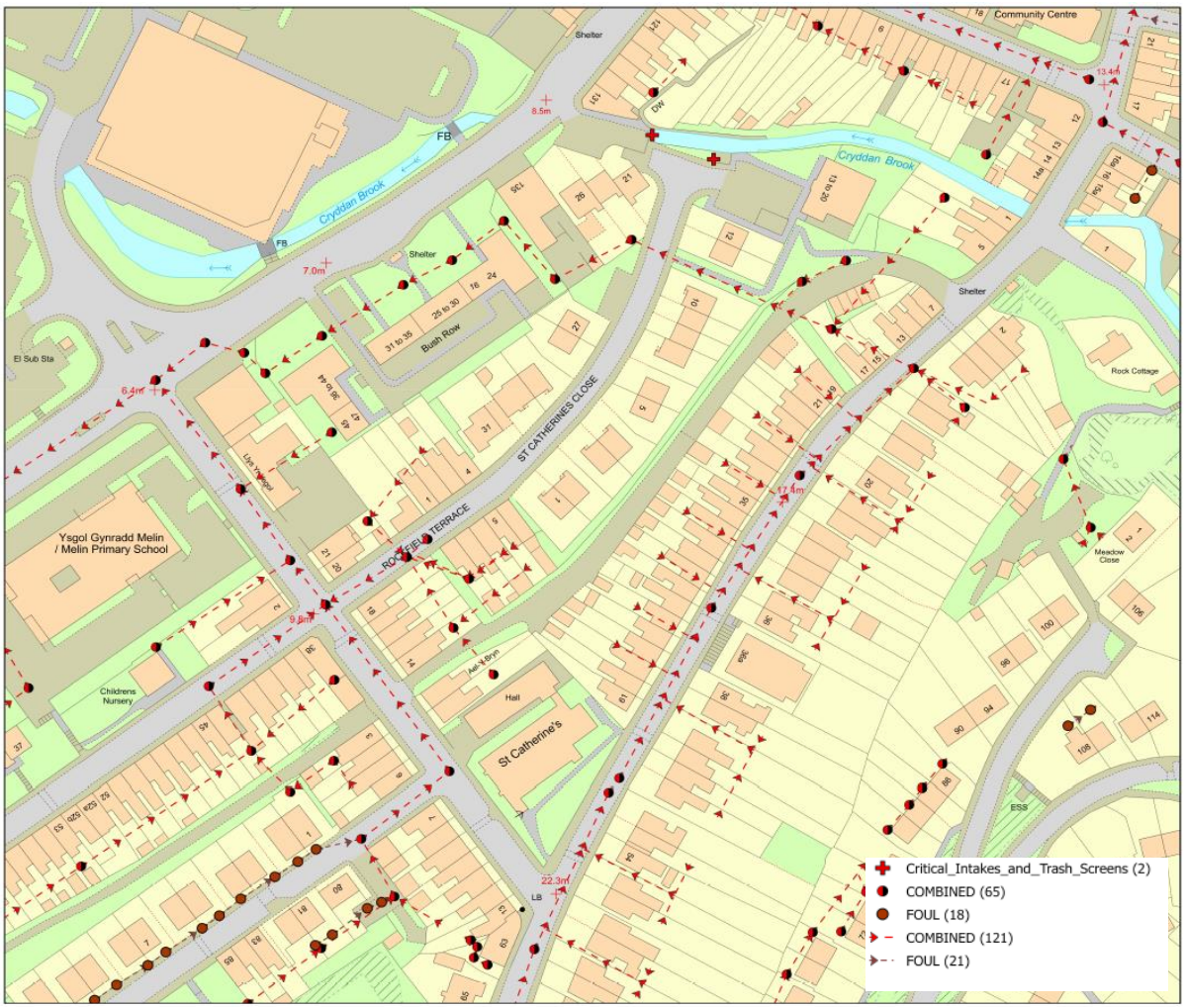

Figure 8 – Map of DCWW foul and combined sewer assets at St Catherine's Close.

Figure 9 overleaf illustrates the general flow path of the flood water that overtopped on the afternoon of November 3rd 2022, with the arrows marking the direction of flow. From the map, it is clear that the properties at St Catherine's Close are at severe risk when this overtopping occurs due to their location in relation to the position of the culvert.

These flood paths provide an indication into the topography of the site. For instance, when overtopping occurs, the flow of water first travels in a north-westerly direction before diverting south west along the A474, towards the Esso Garage. This reflects the difference in ground level where the topography of the site dips west of the culvert and then dips again as the gradient of the road flows south-west.

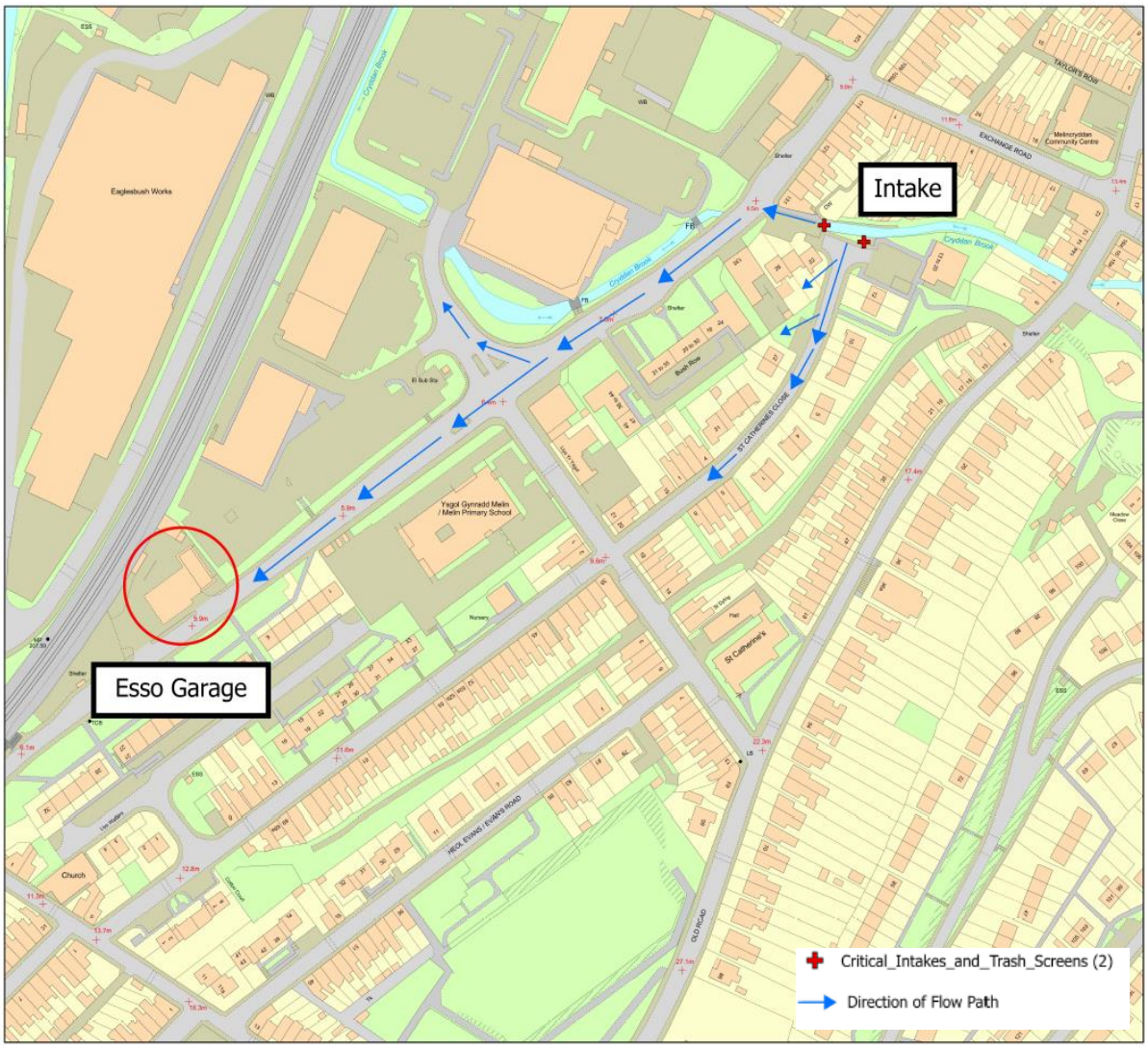

Figure 9 - Map depicting the genreal flow route of water through Melyn and St Catherine's Close.

2.5. Summary of Water Flows on 3rd November 2023

Intense rainfall over the course of a thirty-six hour period, coupled with the mass accumulation of large debris at the St Catherine's Close intake, contributed to the rapid rise of water. This resulted in overtopping and the distribution of water from the culvert. Floodwater first followed the topography of the site and travelled west before diverting south-west along the A474. Floodwater also followed the path of the impermeable, tarmac road, entering nearby properties until reaching the stone wall by the Vintage 7 Antique Centre. The pressure from the heavy flow of water collapsed this wall, entering the outside area of the Antique Centre and causing significant internal flooding.

2.6. Detailed Investigation Findings

During the afternoon of 3rd November 2022, St Catherine's Close intake overtopped as a result of an intense rainfall event, coupled with significant blockage of the intake. It was found that large natural logs from Eaglebush Valley and a fly-tipped carpet were present at the intake, preventing water entering via the pipe or overflow pipe. A total of thirty (30) properties experienced flooding, twelve (12) of which were at St Catherine's Close.

The investigation determined that the clearing procedure for removing debris within the channel was not optimal. This was due to the JCB machine which is typically used for safe clearance having a limited reach capacity when positioned next to the overflow chamber. A notable short term solution, which NPTCBC immediately implemented, was to position concrete blocks at ground level along the structural walls. This allows a machine to mount these blocks, achieving an improved reach to better clear the trash screen. Another immediate solution was to remove some of the bars of the trash screen in order to increase the spaces between remaining bars.

As well as the immediate actions that were taken, a steel fabricator has been engaged to carry out some improvements to both the main and overflow screens for the intake structure. For the main channel, a new screen will be installed further upstream which will allow a clearance machine to reach more easily and will capture larger material that is washed down. A new section of horizontal screen with large bar spacing will be provided directly behind the raking element and water will be able to enter the culvert more easily, should the raking section become blocked.

For the overflow channel, water currently has to pass through two sections of debris screen, one vertical, the other horizontal, over the overflow chamber. The horizontal section is proposed to be raised which will mean that water overflowing will only need to pass through one set of screens reducing the risk of blockage.

The new screens will be provided with the maximum bar spacing allowed for security. This work will be carried out in January 2024.

2.7. Summary of Investigation Findings

It can be noted that whilst the daily average rainfall values for Thursday 3rd November 2022 were particularly high, it was consistent with the rainfall that was also observed in preceding and succeeding weeks. Therefore, the blockage at the St Catherine's Close intake is considered the main contributing factor as to why flooding occurred at St Catherine's Close on this date. Without this blockage it is expected that the culvert would have been able to cope with the intensity of the rainfall experienced. Notwithstanding this however, the investigation has determined that the design of the culvert at St Catherine's Close can be enhanced in order to maximise mitigation efforts against future floods.

The temporary mitigation measures introduced by NPTCBC since the flood event included placing a circa 600mm concrete block adjacent to the existing brick wall, as close to the overflow chamber as possible, and increasing the trash screen bar spaces. Further alterations to the screens are expected to be completed early in 2024. Options for improvement, without a major multi-million pound scheme are however limited. Further investigations are however ongoing into a more comprehensive a longer term solution.

It is noted the culvert at St Catherine's Close has already been identified as a 'critical asset'. This means the culvert, among many others across the county borough, undergoes regular weekly cleansing procedures and is fitted with a camera to monitor the live water level in the event of a possible blockage. This allows NPTCBC to be aware of any potential flood event and commence responses as soon as possible.

3. Recommended Action

The actions contained within Table 1 are recommended to be taken forward by the relevant RMA or property/landowner.

No.	Action by	Action	How it will be achieved
1.	NPTCBC	Continued investigation and development of Cryddan Brook Flood Alleviation Scheme. Continue to maintain and inspect the structure on a weekly basis.	Continued investigation and business case development by NPT and consulting partners with grant funding from Welsh Government. Proactive development of the business case towards funding for a major scheme.
2.	NPTCBC	Raise awareness with the community about the repercussions of fly-tipping.	Letter drops and the sharing of information on fly tipping and enforcement action where necessary. Produce informative leaflet on the impact fly-tipping has on flood risk.
3.	NRW	Raise awareness with private businesses about the repercussions of fly-tipping.	Letter drops and the sharing of information on fly tipping and enforcement action where necessary.

Table 1 - Recommended Actions

4. Appendices

4.1. Appendix A - Duty to Investigate

The Flood Risk Regulations 2009 and the Flood and Water Management Act 2010 identify NPTCBC as the Lead Local Flood Authority (LLFA) for the area. This has placed a number of flood risk management duties and responsibilities on the Council. In particular, Section 19 of the Flood and Water Management Act 2010 places a duty upon NPTCBC to undertake investigations into flood events to the extent that it considers necessary.

A 'Risk Management Authority' (RMA) means:

Flood and Water Management Act: Section 19 - Local authority investigations:

(1) On becoming aware of a flood in its area, a lead local flood authority must, to the extent that it considers it necessary or appropriate, investigate—

(a) which risk management authorities have relevant flood risk management functions, and

(b) whether each of those risk management authorities has exercised, or is proposing to exercise, those functions in response to the flood.

(2) Where an authority carries out an investigation under subsection (1) it must—

(a) publish the results of its investigation, and

(b) notify any relevant risk management authorities.

Flood and Water Management Act (2010), S.19, c.29, London: HMSO

When considering if it is necessary or appropriate to investigate a flood event within its area, NPTCBC will review the severity of the incident along with the number of properties affected and the frequency of such an occurrence. The Council's Local Flood Risk Management Strategy sets out the criteria to be used when considering a Flood Investigation Report.

4.2. Appendix B - Risk Management Authorities Responsibilities

RMAs in Neath Port Talbot have responsibilities in relation to flood risk management. T able 2 below identifies numerous sources of flooding and the RMA that has responsibility and flood risk management functions relating to a particular source of flooding.

Table 2, Responsibilities of Risk Management Authorities

Flood Source	Natural Resources Wales	Lead Local Flood Authority	Water Company	Highway Authority
Main River	✓			
Ordinary Watercourse		✓		
Surface Water		✓		
Surface Water Originating on the Highway				✓
Sewer Flooding			✓	
The Sea	✓			
Ground Water		✓		

The general responsibilities placed upon RMAs in relation to flood risk management are outlined below.

Natural Resources Wales

Natural Resources Wales (NRW) is responsible for managing the risk of flooding from main rivers and the sea. NPTCBC works closely with NRW, especially when managing flood risk from combined sources and in the event of a large flood incident. NRW also provide a flood warning service throughout Wales in areas at risk of flooding from rivers or the sea.

Neath Port Talbot County Borough Council as LLFA

NPTCBC is responsible for managing the flood risk related to ordinary watercourses, groundwater and surface water. NPTCBC has produced a Flood Risk Management Plan in line with the Flood Risk Regulations 2009 which sets out how the Authority proposes to undertake this function. In addition to this and as previously stated, the Authority also has a Local Flood Risk Management Strategy which was produced to meet the requirements of the Flood and Water

Management Act 2010. There are a number of duties and responsibilities placed upon the Authority as the LLFA for the area by these two legislative documents. The Authority is also responsible for consenting works on ordinary watercourses and enforcing the removal of any unlawful structure or obstruction within the watercourse.

Neath Port Talbot County Borough Council as Highway Authority

The Authority undertakes routine maintenance on the water conveyance infrastructure contained within the highway including culvert and gully cleansing operations. These operations, together with visual inspections of the condition of such assets are undertaken to reduce the risk of flooding on the adopted highway network and adjacent land.

Dwr Cymru Welsh Water

Dwr Cymru Welsh Water (DCWW) is responsible for the supply of drinking water and for taking away, treating and properly disposing the wastewater that is produced throughout Wales. Any flooding that occurs from the overload of public sewers or burst water mains is the responsibility of DCWW.

South Wales Trunk Road Agency

The South Wales Trunk Roads Agency (SWTRA) is responsible for maintaining and managing the trunk road network throughout South Wales, including any associated drainage and flood risk assets.

Land/Property Owners

Under common law, land or property owners have rights and responsibilities relating to any watercourse that passes through or adjacent to the boundaries of their land. This means that the landowner must:

- Pass on flow without obstruction, pollution or diversion affecting the rights of others.
- Accept natural flood flows through their land, even if caused by inadequate capacity downstream, as there is no common law duty to improve a watercourse.
- Maintain the bed and banks of the watercourse (including trees and shrubs growing on the banks) and clear any debris, natural or otherwise, including litter and animal carcasses, even if it did not originate from their land.

- Not cause any obstructions to the free passage of fish.
- Keep the bed and banks clear from any matter that could cause an obstruction either on their land, or by being washed away by high flow to obstruct a structure downstream.
- Take responsibility for protecting their property from seepage through natural or constructed banks.
- Keep clear any structure that they own such as culverts, trash screens, weirs etc.

Under the FWMA 2010, a landowner needs consent from the Council if they want to construct a culvert or flood relief control structure on any ordinary watercourse.