DŴR CYMRU WELSH WATER

EVENT DURATION MONITORING

December
2024

Document ID:

EDM TEN Initial investigation report
BW4108401
Elmgrove Road CSO, Swansea

Asset ID No. 71023

DOCUMENT CONTROL

Version	Status	Date	Author(s)	Description of Change
1	Initial draft	24/10/2023	A.Moule	
1	Draft Check approved	01/11/2023	G.Griffiths	
2	Initial Investigation Report Peer Review	02/11/2023	Helena Hopkins	
3	Final Report	13/12/2024	G.Griffiths	

Abbreviations

EDM……	**Event and Duration Monitoring**
TBN……	**Trigger Breached Notification**
CSO……	**Combined Sewer Overflow**
SPS…….	**Sewage Pumping Station**
WwTW……	**Wastewater Treatment Works**
DWF……	**Dry Weather Flow**
PFF……	**Pass Forward Flow**
STMF……..	**Storm Tank Flow**
STMRF……...	**Storm Tank Return Flow**
FFT……	**Flow to Full Treatment**
SAS……	**Surplus Activated Sludge**

1.0 Executive Summary

Elmgrove Road CSO is permitted to discharge under BW4108401 to a surface water sewer that discharges into Washinghouse Brook, West Cross. Washinghouse Brook eventually discharges into Swansea Bay approximately 750m away.

The asset breached its EDM requirements on 02/08/2023 when it spilt for the sixth time during the bathing season as per the Spill Block Counting Method.

Desktop studies and catchment investigations have been undertaken, and the root cause for spills were caused by serviceability issues in the downstream network. A series of operational maintenance activities have been undertaken and the spills have dropped off.

2.0 Site Information

2.1 Site Location

The village of West Cross is an urban area adjacent to Mumbles, in the SA3 region, approximately 3.5miles Southwest of Swansea city centre.

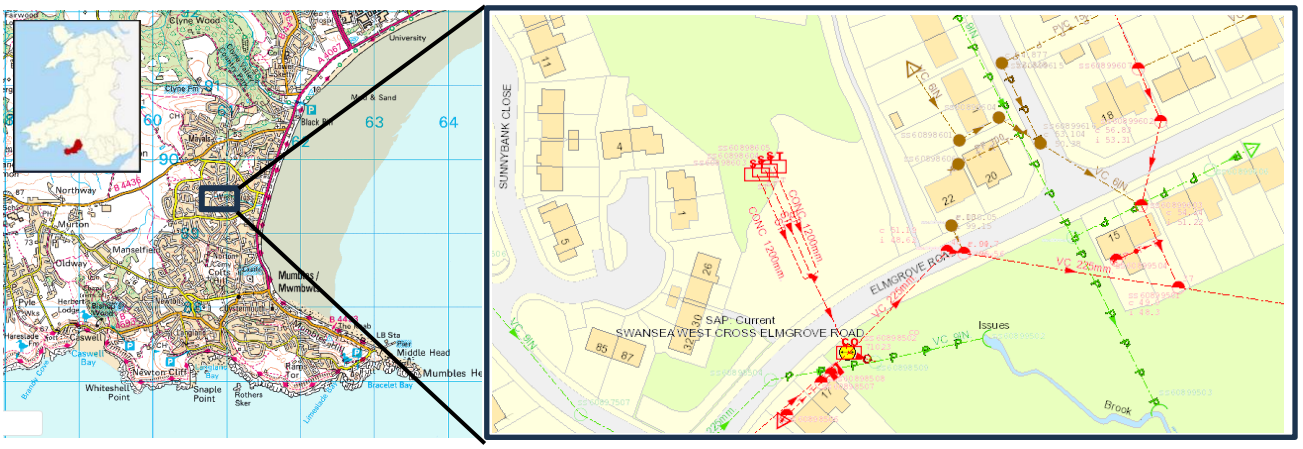


Figure 1: Location of Elmgrove Road CSO, West Cross, Swansea, Wales

2.2 Consent and EDM Requirements

Elmgrove Road CSO is permitted to discharge under BW4108401. The notable conditions for discharge are:

- Overflow setting 38l/s
- Solid matter no greater than 6mm in more than 2 dimensions
- Screen aperture 6mm wedge wire screen
- Discharge Point NGR SS 60901 89573

The asset breached its EDM requirements on 02/08/2023 when it spilt for the sixth time during the bathing season as per the Spill Block Counting Method.

2.3 Asset and Telemetry Description

The catchment upstream of Norton Avenue CSO consists of mainly residential properties covering an area of approximately 0.24sq. km

Discharges are monitored with a 'CELLO' ultrasonic sensor, used for EDM purposes. PFF is controlled by the diameter of the outgoing pipe and capacity of the downstream network.

If the incoming flow exceeds the capacity of the continuation pipe, the level in the CSO chamber rises and the adjacent storage tanks start to fill. Once these are full, the level in the CSO chamber continues to rise until it reaches the weir level. Spill occurs when PFF rate from the CSO is more than 38 l/s & storage of 120m^3 is full, resulting in flows passing through the screen and into the overflow which connects into an adjacent surface water sewer that discharges into Washinghouse Brook, West Cross. Washinghouse Brook eventually discharges into Swansea Bay approximately 750m away.

3.0 Desktop Study

3.1 Telemetry Data Analysis

A review of the telemetry data has been carried out for the period of recorded spills across the 2023 bathing water season. Data sets for all spills are consistent with response to rainfall events in the catchment and also other monitored assets in the surrounding area.

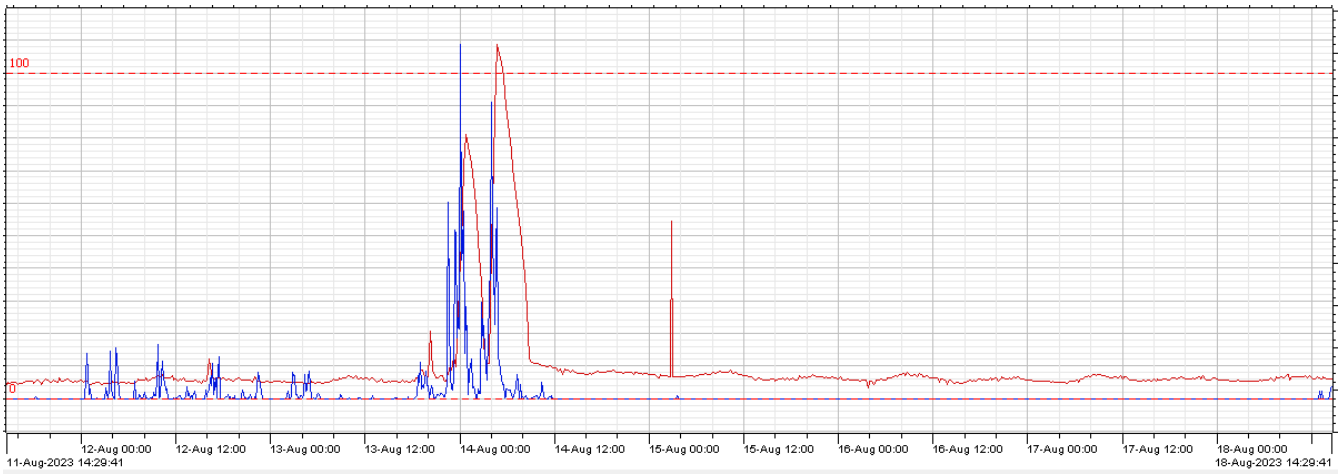


Figure 2 - Red displays wet well level. Dotted red line indicates spill level. Blue displays rainfall. Data indicates direct link to rainfall events and suggest hydraulic overload issues.

3.2 Catchment Review

There is currently no Sustainable Drainage Plan scheduled for the catchment.

4.0 Initial Investigation Conclusions

4.1 Root cause statement

The root cause of CSO spill frequency has been determined as reduced capacity of the storage tanks due to siltation combined with restrictions in the downstream network caused by root ingress where the sewer continues through a dense woodland area.

4.2 Root cause Investigations and work undertaken

Upon notification of the asset breaching its' EDM conditions, an inspection of the storage tanks and CCTV investigations of the downstream network were undertaken to check for any obstructions that may be impeding PFF through the CSO. A partial settlement of silt and minor root intrusion was found in the storage tanks, whilst the sewer downstream of the CSO was found to have root intrusion over a 165m distance between manholes SS60898510 and SS61890501.

4.3 Further Work Required

- Works have been released to DCWW framework contractor to undertake full cleansing and root removal of the tanks and sewer downstream of the CSO.

4.4 Initial Investigation Recommendations

We aim to complete the investigation works by 29th February 2024.

Stage 5: Implement Solutions

Stakeholder Communication

CCTV and cleansing work have been undertaken at the asset. Material was removed from the storage tanks and a root mass removed from the downstream network.
This work was undertaken 12/09/2023 and spills have now reduced.
See report extract in appendix 1

Stage 6: Close Out Report

Spill Reduction Performance

There have been 4 spills sine 1st January this year, these are all related to heavy rainfall and storm conditions.
See appendix 2 for spill trend pre and post cleansing.

Trigger Exceedance Close Out Statement

The trigger exceedance was due to a root mass in the downstream system, compounded with debris buildup in the storage tanks. The root mass has been removed and the tanks cleansed. The spills have now reduced to the expected number.

Appendix 1

METRO ROD
DRAIN CARE AND REPAIR

CCTV Inspection Report

Metro Rod (Swansea)
Unit 15/16
Swansea Valley Business Park
Ystalyfera
SA9 2EB

Surveyed by (Operator)	Job Number	Pipe Length Reference (PLR)	Date	Pre Cleaned
Chris Williams	**123456**	**SS608985 X**	**01/09/2023**	**Not Cleaned**
Weather	Customer Present	Service Grade/Structural Grade	Base Unit	Section Number
3 - Light Rain		**5/0**	**AFMS5KN8HP**	**7**

Road **Elmgrove Road, West Cross, SA3 5LD**
Place
Location

Ground Surface
Code List **Drain and Sewer Codes (5th Edition)**
Location Details

Shape/Size **225mm**
Material **Vitrified clay**
Duty **Combined**

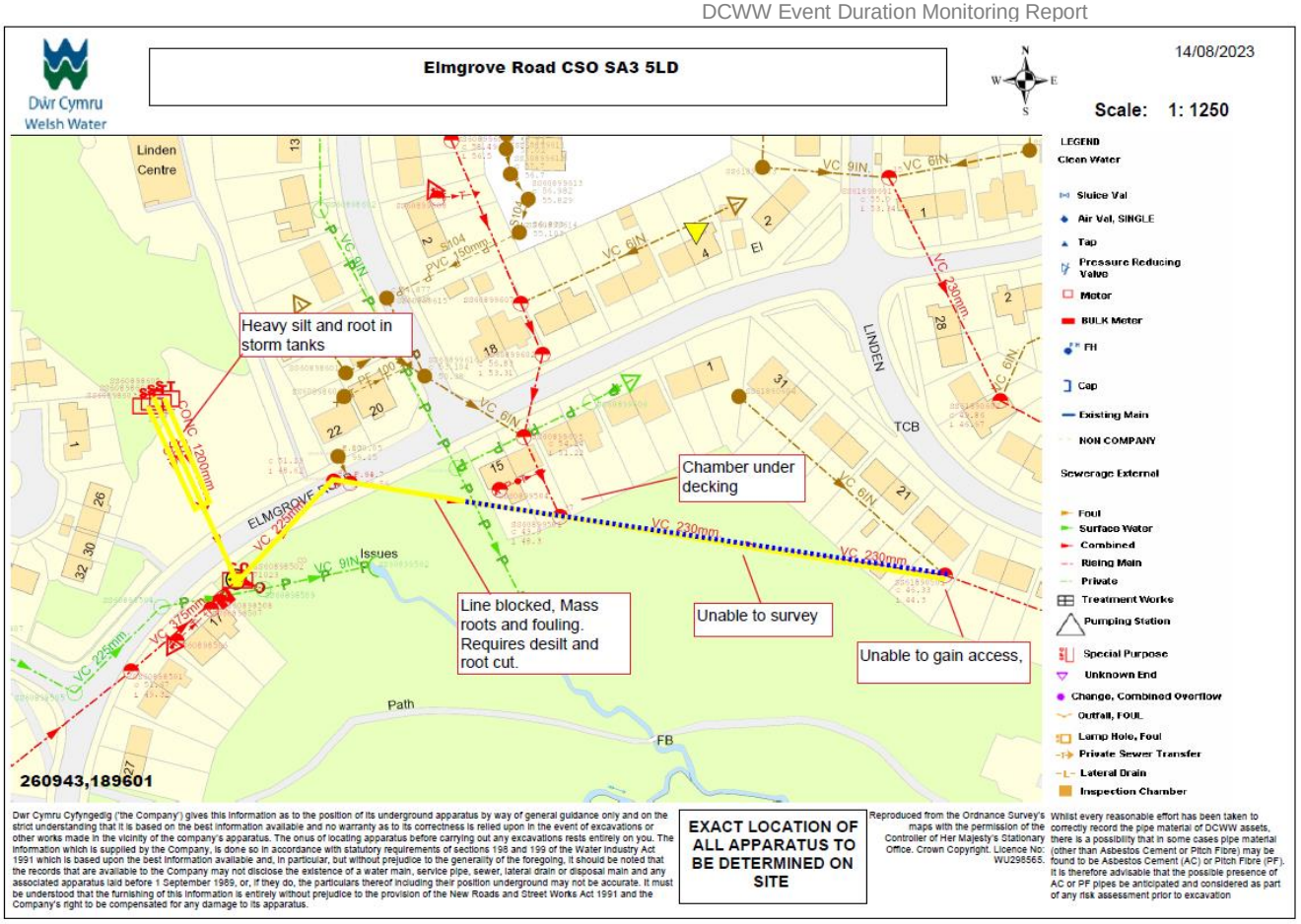
Start MH **SS608985**
End MH **SS60898501**
Total length **60 metres**

Scale **1:3.15**
Direction **Downstream**

Start Node Ref:SS608985 | I/L : metres | Depth: 2500 metres

Position	Code	Description	Photo	Type/Grade
0.00	MH	Start node type, Manhole, reference SS608985	8496221	Null / 0
0.00	WL	Water level 30% height/diameter	8496222	Null / 0
0.81	WL	Water level 60% height/diameter - Remark: Camera Under Water	8496227	Comment / 0
9.75	WL	Water level 10% height/diameter - Remark: Water level reduces down to 10%	8496257	Comment / 0
20.11	WL	Water level 60% height/diameter - Remark: Water level increase and Camera Under Water	8496276	Comment / 0
31.33	DEX	Other settled deposits 100% cross-sectional area loss - Remark: Blue roll and Wipes	8496288	Service / 5
31.33	RM	Roots mass 100% cross-sectional area loss - Remark: Blue roll push off and identified mass roots	8496310	Service / 5
31.33	SA	Survey abandoned - Remark: Blocked Sewer - Mass roots and Fouling	8496333	Comment / 0

End Node Ref:SS60898501 | I/L : metres | Depth: N/A metres

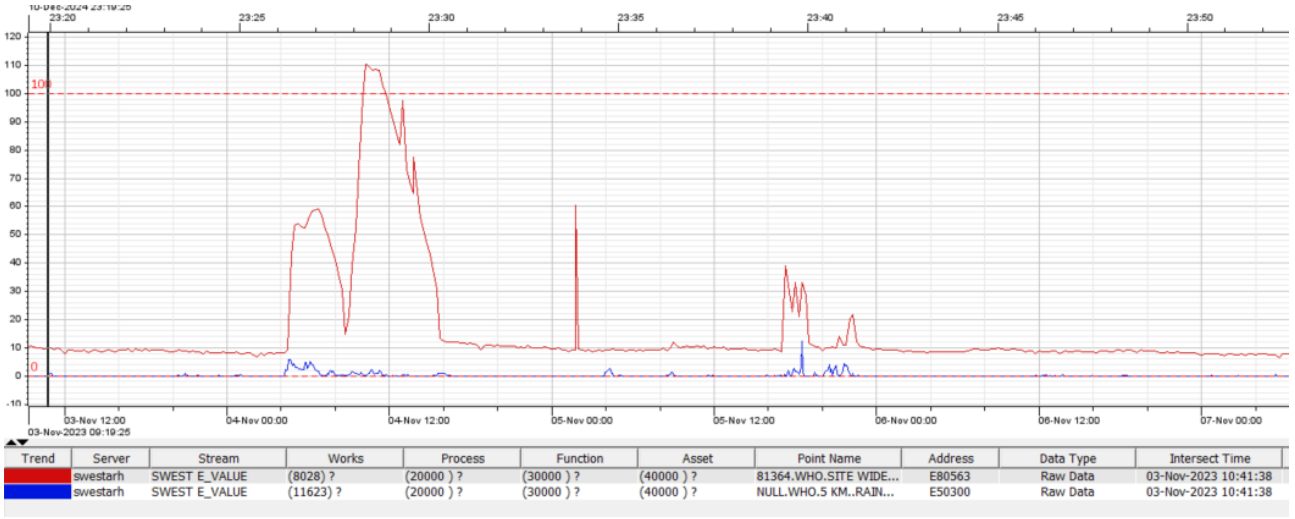


Dwr Cymru Cyfyngedig ("the Company") gives this information as to the position of its underground apparatus by way of general guidance only and on the strict understanding that it is based on the best information available and no warranty as to its correctness is relied upon in the event of excavations or other works made in the vicinity of the company's apparatus. The onus of locating apparatus before carrying out any excavations rests entirely on you. The information which is supplied by the Company, is done so in accordance with statutory requirements of sections 198 and 199 of the Water Industry Act 1991 which is based upon the best information available and, in particular, but without prejudice to the generality of the foregoing, it should be noted that the records that are available to the Company may not disclose the existence of a water main, service pipe, sewer, lateral drain or disposal main and any associated apparatus laid before 1 September 1989, or, if they do, the particulars thereof including their position underground may not be accurate. It must be understood that the furnishing of this information is entirely without prejudice to the provision of the New Roads and Street Works Act 1991 and the Company's right to be compensated for any damage to its apparatus.

EXACT LOCATION OF ALL APPARATUS TO BE DETERMINED ON SITE

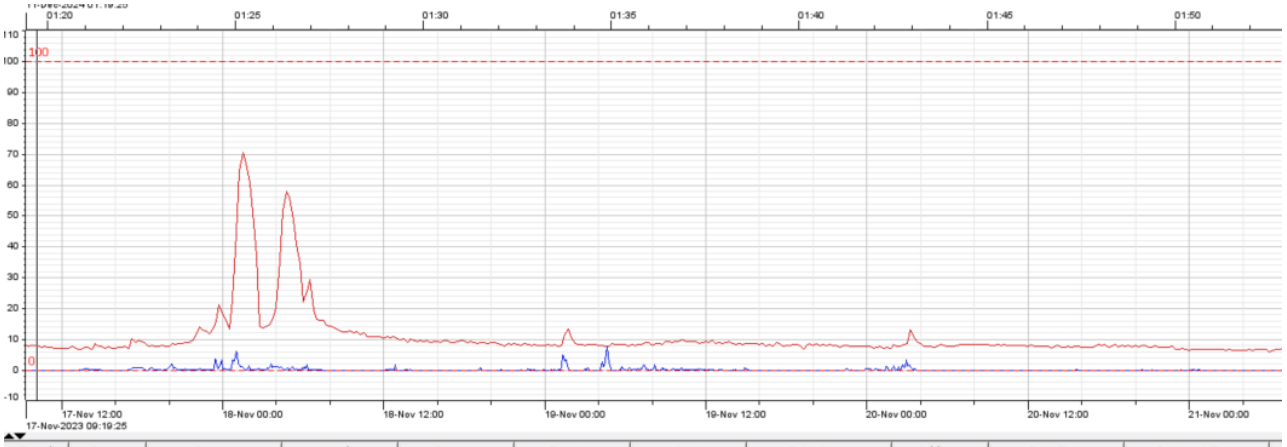
Whilst every reasonable effort has been taken to correctly record the pipe material of DCWW assets, there is a possibility that in some cases pipe material (other than Asbestos Cement or Pitch Fibre) may be found to be Asbestos Cement (AC) or Pitch Fibre (PF). It is therefore advisable that the possible presence of AC or PF pipes be anticipated and considered as part of any risk assessment prior to excavation

Appendix 2



Trend	Server	Stream	Works	Process	Function	Asset	Point Name	Address	Data Type	Intersect Time
	swestarh	SWEST E_VALUE	(8028) ?	(20000) ?	(30000) ?	(40000) ?	81364.WHO.SITE WIDE...	E80563	Raw Data	03-Nov-2023 10:41:38
	swestarh	SWEST E_VALUE	(11623) ?	(20000) ?	(30000) ?	(40000) ?	NULL.WHO.5 KM..RAIN...	E50300	Raw Data	03-Nov-2023 10:41:38

Figure 1: extract showing telemetry trend before cleansing task complete



Trend	Server	Stream	Works	Process	Function	Asset	Point Name	Address	Data Type	Intersect Time
	swestarh	SWEST E_VALUE	(8028) ?	(20000) ?	(30000) ?	(40000) ?	81364.WHO.SITE WIDE...	E80563	Raw Data	17-Nov-2023 10:02:41
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Figure 2: extract showing telemetry trend after cleansing task complete