



## Event Duration Monitoring

### Trigger Exceedance Notification

#### **Document ID**

Report type: Stage 6: Close Out Report

Permit Number: BP0237402

Receiving / Impacted waters: (BW )

Location: Combined Sewer Overflow at Dunns Lane/Park Street

DCWW Asset ID: 74550

CAR References: CAR\_NRW0045717

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## Document Control

| Version | Status                                       | Date     | Author(s)   | Description of Change  |
|---------|----------------------------------------------|----------|-------------|------------------------|
| 1       | Stage 2: Full Investigation Proposal - Draft | 29/01/25 | J.Turner    | Initial report - Draft |
| 2       | Please Select                                | 12/02/25 | G Griffiths | Final close out        |
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## 1. Summary of Each Stage

This TEN document follows the six Spill Frequency Trigger stages as detailed in the “*Water and Sewerage Company actions following a spill frequency trigger permit condition exceedance*” guidance document (GN005) to comply with the associated permit conditions.

The consent for asset Combined Sewer Overflow at Dunns Lane/Park Street is BP0237402. The EDM classification for this asset is Bathing Water and has a limit of 5 spills. The asset breached its EDM requirements on the 1<sup>st</sup> of September 2024 when it spilt for the 6<sup>th</sup> time as per the Spill Block Counting Method. On the issue of the TEN 1/10/2024 it had spilt 7 times.

Detailed root cause analysis has been undertaken at this asset. Abnormal readings were recognised from the monitor. The monitor was found to be faulty has since been replaced, there is a step change in the readings.

From the review we don’t believe this asset breached as the monitor was giving false readings. The monitor has since been replaced and is trending well.

### 1.1. Stage 1: Spill Frequency Trigger Summary

- Consent Number BP0237402 = BW/6 spills in bathing season (as per the spill block counting method)

TEN History:

| Year  | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 |
|-------|------|------|------|------|------|------|------|------|
| TEN ? | No   | Yes  | Yes  | -    | -    | -    | -    | -    |

- Stage 1 Acceptance of the TEN by DCWW 01-09-2024

### 1.2. Stage 2: Initial Investigation Summary

Through desk top analysis & onsite investigation, detailed Root cause could not be determined.



## 2. Stage 2: Initial Investigation

### 2.1. Site Location

Dunns Lane CSO is situated in the village of Mumbles, Swansea. The CSO is situated in the foreshore carpark at the bottom of Dunns Lane. Flows gravitate to the CSO before entering the trunk sewer to Knab Rock SPS.

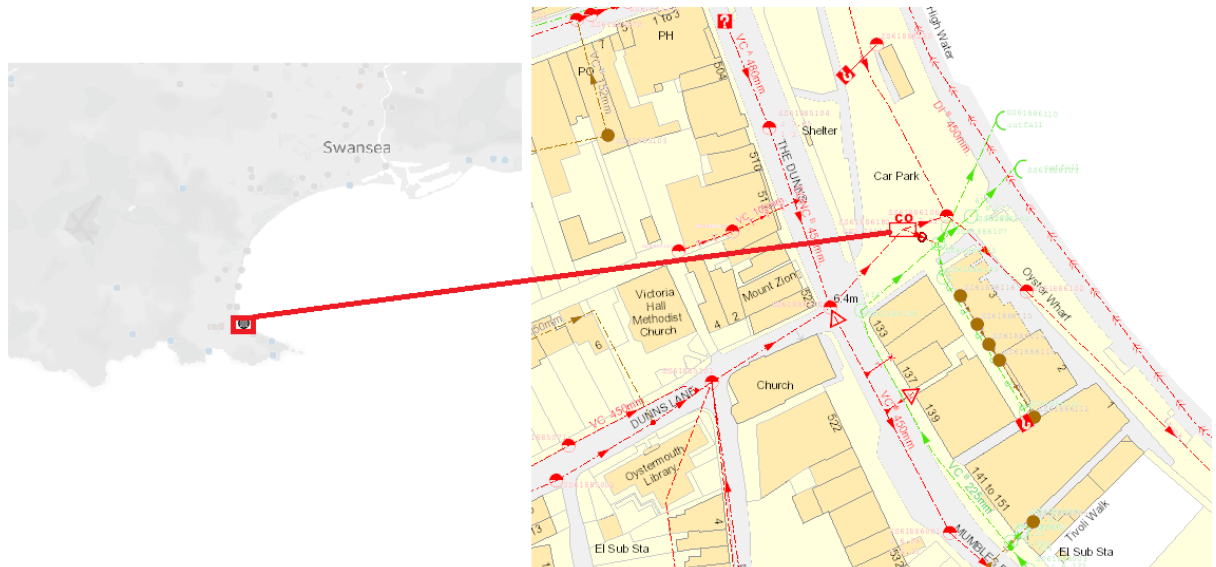


Figure 1: Location of the Dunns lane CSO and the surrounding sewage network



## 2.2. Permit & EDM Requirements

| Effluent and discharge point     | Parameter                         | Limit (including unit) | Reference Period                                               | Limit of effective range | Monitoring frequency        | Compliance Statistic                                                                                                                    |
|----------------------------------|-----------------------------------|------------------------|----------------------------------------------------------------|--------------------------|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| Storm sewage via Discharge point | Discharge start and end times     | N/A                    | N/A                                                            | N/A                      | Whenever a discharge occurs | N/A                                                                                                                                     |
|                                  | Block counted significant spills  | 5 spills               | 15 <sup>th</sup> May to 30 <sup>th</sup> September inclusive   | N/A                      | 15 minutes                  | (Condition 3.1.2 applies - the spills threshold is a trigger for investigation only and not a statistic for use in compliance of asset) |
|                                  | Block counted spills              | N/A                    | 15 <sup>th</sup> May to 30 <sup>th</sup> September inclusive   | N/A                      | 15 minutes                  | N/A                                                                                                                                     |
|                                  | Block counted significant spills  | N/A                    | 1 <sup>st</sup> January to 31 <sup>st</sup> December inclusive | N/A                      | 15 minutes                  | N/A                                                                                                                                     |
|                                  | Block counted spills              | N/A                    | 1 <sup>st</sup> January to 31 <sup>st</sup> December inclusive | N/A                      | 15 minutes                  | N/A                                                                                                                                     |
|                                  | Event recorder status operational | N/A                    | N/A                                                            | N/A                      | 15 minutes                  | N/A                                                                                                                                     |

| Effluent Name | Discharge Point | Discharge point NGR | Receiving water |
|---------------|-----------------|---------------------|-----------------|
| Storm sewage  | Discharge point | SS 61671 88163      | Swansea Bay     |

| Effluent and discharge point     | Description of discharge | Overflow setting l/s | Maximum size of solid matter                  | Screen aperture size | Minimum screen capacity flow l/s | Minimum storage capacity m <sup>3</sup> (off-line) |
|----------------------------------|--------------------------|----------------------|-----------------------------------------------|----------------------|----------------------------------|----------------------------------------------------|
| Storm sewage via Discharge point | Storm sewage             | 62                   | No greater than 6 mm in more than 1 dimension | 6 mm x 6 mm          | 122                              | N/A                                                |

Figure 2: Dunns Lane CSO Discharge Permit Details

## 2.3. Asset and Telemetry Description

The CSO consists of a concrete chamber with a 600mm diameter incoming pipe and a 600mm diameter continuation pipe connecting to the downstream network. The PFF is controlled with an orifice plate. When the flow entering the CSO is greater than 62l/s, the entering flow surcharges, and weirs to the Storm water system before discharging to the environment via a 375mm outfall pipe.

Telemetry is via a Cello monitor; a spill is triggered when the level reaches 100%.

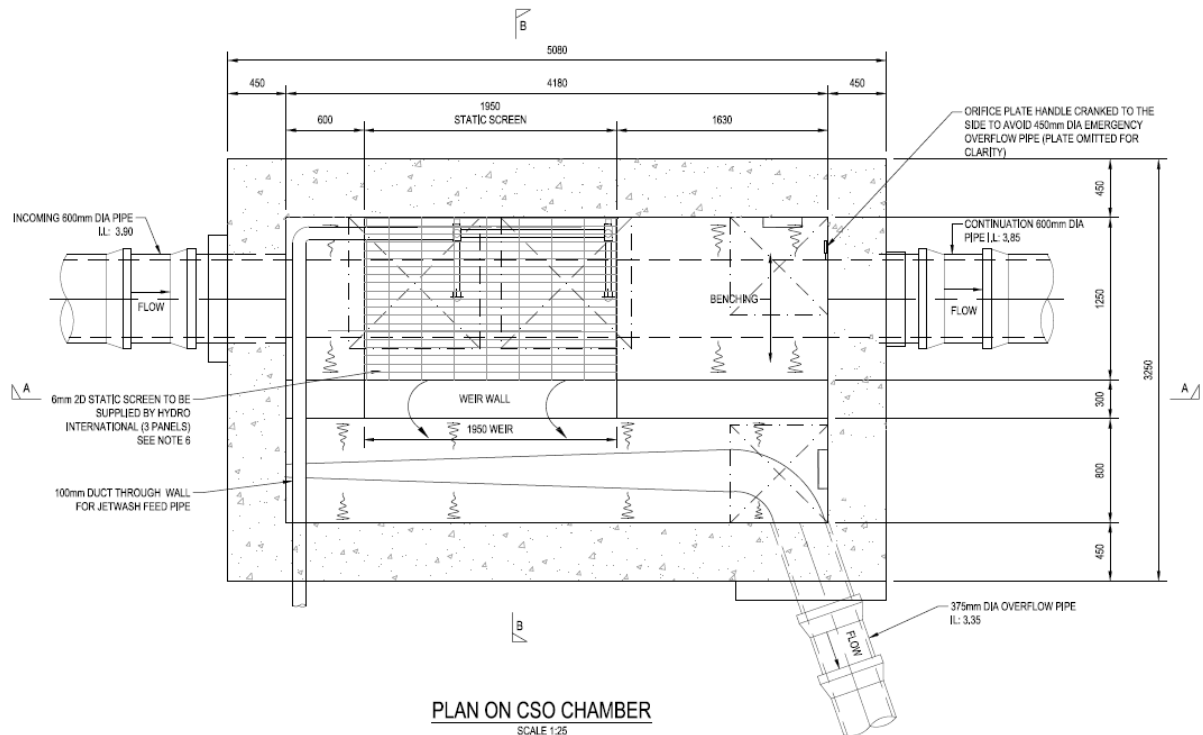


Figure 3: Plan View of CSO chamber

## 2.4. Telemetry Data Analysis

3. Bathing season spills occurred from 21/05/2024 – 01/09/2024 as shown in the screen shot below (Figure 4) taken in from Scopex / Prism telemetry data.

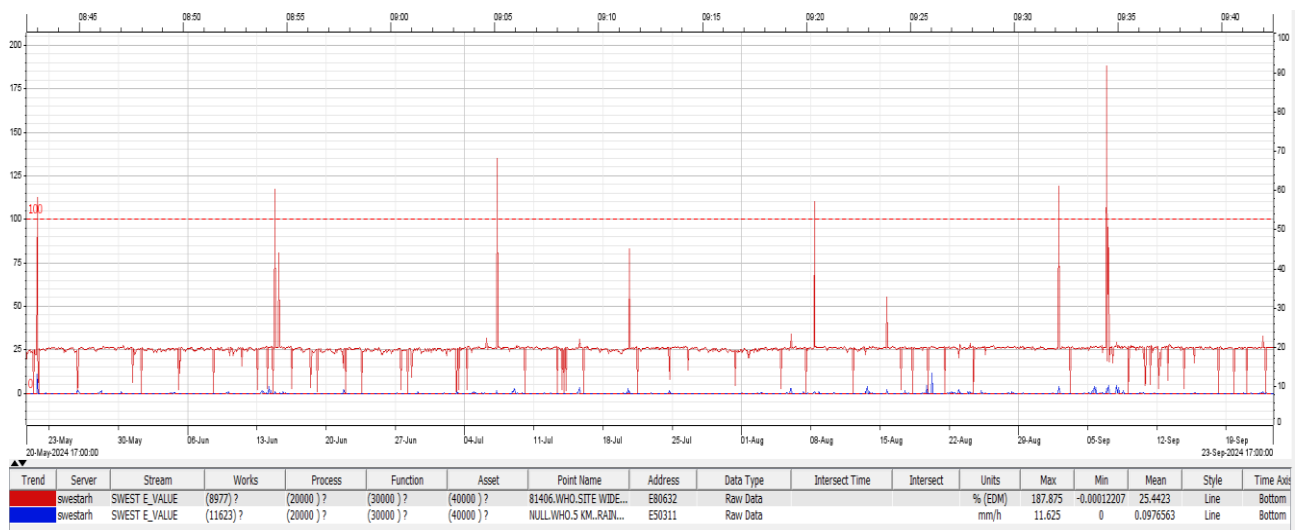


Figure 4: Scopex / Prism telemetry data.

Figure 4: graph showing –

■ = CSO Levels

■ = Rainfall Intensity



### 3.1. Catchment Review

The network in the area of the asset has been surveyed and no problems found.

### 3.2. Root Cause Statement

A detailed Root cause cannot be determined at this stage

### 3.3. Stage 2: Next Steps

Detailed root cause analysis has been completed, with several visits to the assets and surveys undertaken.

### 3.4. Stage 2 Full Investigation Plan

There has been a change in reporting, so our investigations have been undertaken before getting to this stage in the report.

Table X: Full Investigation Plan

| Action Ref. | Action Required                                       | Action Due Date | Comments                                                                                                                                              | Complete (Y/N) | Completion Date |
|-------------|-------------------------------------------------------|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-----------------|
| 1           | CCTV survey in the local area to check connectivity   | 01/03/2025      | Completed, no issues found                                                                                                                            | y              | 12/09/2024      |
| 2           | Check tidal flap valve                                | 01/03/2025      | Completed, no issues found                                                                                                                            | y              | 12/09/2024      |
| 3           | Check asset with CSO maintenance team                 | 01/03/2025      | Maintenance team confirm that the screen in this asset is always clean and very rarely spills.                                                        | y              | 21/06/2024      |
| 4           | Review of telemetry data for accuracy                 | 01/03/2025      | In reviewing the data, we found that the asset was spiking in both up and down. An asset of this size would be expected to see more or a gradual rise | y              | 19/11/2024      |
| 5           | Site visit to check telemetry monitor                 | 01/03/2025      | Monitor checked – evidence of water entering through the cover and running over the monitor – possible water damage.                                  | y              | 21/06/2024      |
| 6           | Task raised for the telemetry monitor to be replaced. | 01/03/2025      | Complete – step change in readings and spikes up and down no longer evident.                                                                          | y              | 09/01/2025      |



#### 4. Stage 3: Trigger Exceedance Reason Report (TERR)

The root cause has been found to be a faulty monitor in the asset. The monitor has now been replaced and is trending well. It seems on average the monitor was reading 20% above what it should have been and was also giving false spikes, both up and down. This is evidenced in the following figures.



Fig 5. site visit with CSO maintenance team 21/06/2024

The weir wall and screen within the CSO are both clean, indicating that the asset hasn't been spilling. There had been a spill indicated by monitor on 14<sup>th</sup> June so we would have expected to see some debris.



Fig 6. site visit check monitor 21/06/2024

Photo shows monitor and ultrasonic head in chamber – although in dry weather, there is evidence of where water and debris have been entering through chamber lid and running over sensor.



Fig 7. Outfall survey @ high tide 12/09/2024

Photo shows no tidal influence on outfall chamber.

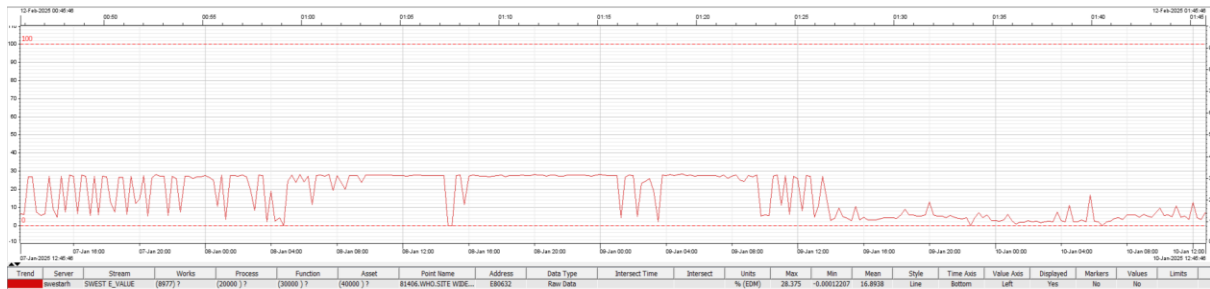


Fig 8. telemetry monitor replaced 9<sup>th</sup> January 2025 @2pm trend over multiple days.



Fig 9. telemetry monitor replaced 9<sup>th</sup> January 2025 @2pm trend over a few hours.

Figures above show the level trend between the 7<sup>th</sup> and the 10<sup>th</sup> of January, this picks up the step change. The high- and low-level spikes are no longer there, and the base line is a lot lower 20%.



5. Stage 4: Spill Reduction Plan

5.1. Spill Reduction Proposal

Identifies how the number of spills will be reduced. The plan must contain reasonable deadlines and be sent to NRW for approval.

**Complete Stage 5** which details our communication plan with NRW during the implementation of the SRP.

Table X: Spill Reduction Plan

| Action Ref. | Action Required | Action Due Date | Comments | Complete (Y/N) | Completion Date |
|-------------|-----------------|-----------------|----------|----------------|-----------------|
|             |                 |                 |          |                |                 |
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## **6. Stage 5: Implement Solutions**

### **6.1. Stakeholder Communication**

DCWW will implement actions outlined in the SRP. There is no permit requirement to send NRW any documents during this stage. However, NRW expect DCWW stay in communication with NRW's lead officer during this stage. This will enable discussion to take place such as progress on completing the actions to the approved deadlines agreed in the SRP.

Detail how NRW will be updated e.g. Tech surgery, TOG, regular update emails etc. and the frequency of these.



## **7. Stage 6: Close Out Report**

### **7.1. Spill Reduction Performance**

Following full root cause investigation, it is now evident that the telemetry monitor wasn't reading accurately.

Since the monitor was replaced and calibrated on 9th January, there is a distinct change in trend, with levels reading a 20% lower base line with removal of positive and negative spikes in readings.

There haven't been any spills recorded between the 9th of January and 12th February when this data was re-checked. There have been high rainfall events in this period and whilst the asset has reacted, it hasn't spilt.



The following table is a review of previous spills with over reading and spikes considered.

As the monitor was reading erratically, it is difficult to be conclusive, but it is unlikely that the asset breached its consent in either 2023 or 2024. In 2003 there were roughly 3 spills, all very heavy rainfall and in 2024 there were roughly 4 spills all very heavy rainfall.

| <b>2023</b>         |              |                    |                    |                                                                                                        |
|---------------------|--------------|--------------------|--------------------|--------------------------------------------------------------------------------------------------------|
| <b>Spill Start</b>  | <b>Block</b> | <b>Max Reading</b> | <b>dropped 20%</b> | <b>Comment</b>                                                                                         |
| 12/06/2023 02:45:00 |              | 140.5              | 120.5              | likely a spill, heavy rainfall 11.37 mm/hr                                                             |
| 24/07/2023 03:45:00 |              | 126.25             | 106.25             | likely a spill, heavy rainfall 14.18 mm/hr nit does seem too reactive                                  |
| 26/07/2023 14:30:00 |              | 115.75             | 95.75              | unlikely to have spilt, with over reading and spiking data rain 8.15mm/hr                              |
| 02/08/2023 11:00:00 |              | 156.625            | 136.625            | unlikely to have spilt, spike data down and up, too reactive for asset type - 9.9mm/hr rain            |
| 13/08/2023 23:30:00 |              | 127.625            | 107.625            | likely a spill, very heavy rainfall 16.75 mm/hr                                                        |
| 25/08/2023 23:45:00 |              | 144.25             | 124.25             | spike data down and up, too reactive for asset type - no rainfall                                      |
| 21/09/2023 08:00:00 |              | 111.875            | 91.875             | unlikely to have spilt, with over reading and spiking data there was rainfall but after spikes         |
| <b>2024</b>         |              |                    |                    |                                                                                                        |
| <b>Spill Start</b>  | <b>Block</b> | <b>Max Reading</b> | <b>dropped 20%</b> | <b>Comment</b>                                                                                         |
| 21/05/2024 18:15:00 |              | 122.5              | 102.5              | likely spill - very high rain fall 39mm/hr but spiking data                                            |
| 14/06/2024 18:45:00 |              | 117                | 97                 | unlikely to have spilt - spike data down and up, too reactive for asset type minimal rainfall 2.5mm/hr |
| 07/07/2024 02:45:00 |              | 134.75             | 114.75             | unlikely to have spilt - spike data down and up, too reactive for asset type minimal rainfall 4.6mm/hr |
| 08/08/2024 08:00:00 |              | 113.625            | 93.625             | unlikely to have spilt - spike data down and up, too reactive for asset type minimal rainfall 1.9mm/hr |
| 24/08/2024 00:30:00 |              | 129.125            | 109.125            | spike data, unlikely to have spilt but possible 8.2 mm/hr rainfall                                     |
| 01/09/2024 23:45:00 |              | 176.75             | 156.75             | spike data, unlikely to have spilt but possible 16 mm/hr rainfall                                      |
| 06/09/2024 20:40:00 |              | 187.87             | 167.87             | likely spill - very high rain fall 59mm/hr but spiking data                                            |
| 26/09/2024 02:25:00 |              | 174.12             | 154.12             | unlikely to have spilt - spike data up, too reactive for asset type low rainfall 5.7mm/hr              |
| 26/09/2024 18:57:00 |              | 137.25             | 117.25             | unlikely to have spilt - spike data up, too reactive for asset type low rainfall 5mm/hr                |

Fig 10. Review of spill data now that over recording and spikes are identified.

## 7.2. Trigger Exceedance Close Out Statement

Following our investigations and interventions, we believe that this asset is performing in line with its permit, and we don't believe it breached its spill number in 2023 or 2024. This is covered above however this is difficult to prove since the monitor wasn't working properly.

CAR form reference - CAR\_NRW0045717



## 8. Appendices

### 8.1. Appendix A: Acronyms/Abbreviations

| Acronym/Abbreviation | Meaning                             |
|----------------------|-------------------------------------|
| AMP                  | Asset Management Plan               |
| CSO                  | Combined Sewer Overflow             |
| DWF                  | Dry Weather Flow                    |
| DCWW                 | Dwr Cymru Welsh Water               |
| EDM                  | Event and Duration Monitoring       |
| FFT                  | Flow to Full Treatment              |
| NGR                  | National Grid Reference             |
| PFF                  | Pass Forward Flow                   |
| SAS                  | Surplus Activated Sludge            |
| SOAF                 | Sewer Overflow Assessment Framework |
| SPS                  | Sewage Pumping Station              |
| SRP                  | Spill Reduction Plan                |
| STMF                 | Storm Tank Flow                     |
| STMRF                | Storm Tank Return Flow              |
| TEN                  | Trigger Event Notification          |
| WWTW                 | Wastewater Treatment Works          |



## 8.2. Appendix B: Attachment X1



### **8.3. Appendix C: Attachment X2**