SOAF Investigation Output Summary

Dŵr Cymru Welsh Water

Cyfoeth Naturiol Cymru Natural Resources Wales

Reference: SOAF.R 00001

Please see Aurill Statement Technical Guidance for further information

ASSET INVESTIGATION DETAILS					
SAP Asset Name:	Pennant WwTW		**Asset Template reference**	BN0015602-CSO at Pennant STW-51745-Stage 4 - Non CBA-Ceredigion	
Investigation Type	SOAF (River)				
Year of breach:	*2020*	**Spill Trigger cause:**		*Hydraulic*	
Year of Investigation:	*2022*	**Investigation year performance:**		*230*	
Population of Asset	*179*	**Modelled Performance: (DESIGN) / (CALIBRATED)**		*50 / 219*	
Permit Details					
Storm Permit ID:	BN0015602	**Storm Permit Name:**		PENNANT STW	
Asset NGR:	SN5090063000	**Waterbody ID**		GB41002G203300	
Discharge NGR:	SN5086763020	**Water body Discharge location**		0	

Brief description of asset
(Screen, PFF flow control, Storage, outfall)

Incoming Pipe: 150mm ; CSO Type: Two low level spill points within WwTW; Screening: Screen with bar gap on 17mm and bar size 10mm (non consented); Flow Control: Limiting discharge orifice ; PFF Pipe: 150mm; Storage Provision: None consented; PFF Consent: Unknown SocA: 5.8l/s

This description relates to the storm sewage discharge from the inlet and outlet of the primary tank (BN0015602). Flow enters the works to the inlet balance tank. Flow in excess of the overflow setting passes over the storm separation weir and discharges to the outfall pipe. There is a second spill downstream of the PST, where flow in excess of the overflow setting pass through the bellmouth pipe and to the outfall pipe.

SOAF STAGE 1	
Details of assessment:	Asset condition surveys supported by hydraulic model assessment of the asset performance against available telemetry information (EDM and radar rainfall datasets). Additional flow and rainfall monitoring was undertaken to improve the baseline model accuracy and assist in defining the root cause of spills.
Permit Compliance	
PFF	Deemed Permit – Meets SocA
Storage	N/A
Screening	N/A
Bespoke/Other	N/A

SOAF Stage 1 findings

Following the hydraulic model assessment, the cause of the high spills at the asset is concluded to be Hydraulic, with OC Telemetry as secondary cause of spills. The asset has a deemed Permit and hydraulic assessment shows PFF meets SocA. The model is fit for use, based on the reported spill numbers and telemetry trends.

Telemetry trends clearly show the effects of rainfall induced groundwater infiltration during the winter months which has a significant effect on the predicted spill count. Representations using an industry standard, average level of infiltration (40% PG) predict a spill count for the assessment year of 50 which is above that of the threshold for investigation level.

Cause of spill count :	**Other Cause**	**OC Telemetry**	**Catchment Hydraulic**	**Yes**	**Infiltration & IRP required**	**No**
Future Operational Management Proposal:	*The primary cause of the high spills is hydraulic and as such the asset progresses for Stage 2 and 3 assessments under the worst-case impact scenario of the current performance. However, operational interventions detailed below are required to mitigate excessive spills beyond the design criteria and should be implemented prior to the final Stage 4 decision confirmation*					
Operational intervention required:	*The standing water present in the syphon chamber to be removed. Re-calibrate telemetry according to the survey spill depth.* *The system is operating as designed and no additional maintenance changes are required to improve the operation of the asset.*					

SOAF Operational Intervention					
Start Date:	**Jun-24**	**Completion Date:**	*TBC*	**Indicative future annual spill performance** *(less than 40 do not continue to stage 2)*	50

Intervention Description:	**Telemetry has been identified as a factor in excess spills at this asset. Telemetry maintenance has been issued to address this problem. This is focused on, the re calibration to correctly capture spills and future performance will be monitored** **Infiltration has been identified as a factor in excess spills at this asset. An infiltration reduction plan (IRP) is in the process of development to address the problem.** **It is recognised in the Storm Overflow Assessment Framework that investigation and resolution of infiltration issues can be difficult and that solutions may be iterative with IRPs potentially only succeeding over the medium to long-term.**				
Target Completion by Date:	**Jun-29**	**Data years to be excluded from future SOAF triggers calculations**	-	**Request to hold stage 2 surveys for environment recovery**	

SOAF STAGE 2					
Receiving Waterbody WFD Status			Good		
Stage 2a					
Aesthetic survey:	Spring	2023	**Aesthetic Total score** (inclusive of amenity classification, previous complaints & pollutions)	10	Very Low
	Autumn	2023		25	Low
Stage 2b				*Yes / No unable due to culverted watercourse*	
Invertebrate survey:	Spring	2023	**Invertebrate survey score:**	8	High
	Autumn	2023		1	No impact
Stage 2c Required:				*Yes / No*	
Stage 2c screening:	Not Required	**Progressed through screening?**	No	**Stage 2c water quality assessment Score:**	Not required

SOAF STAGE 3 - STEP 1>3						
Options assessed	Rainscape		Traditional Storage	Y	PFF Increase	N
Equivalent storage volume required	265m3	**Rainscape Cost**		Not Acheivable	**CBR**	-
Bespoke future trigger agreement	40	**Traditional Storage**		£1,259,628.61	**CBR**	0.0
		Other		N/A	**CBR**	N/A
Key Constraints	*None*					
Future Active Management Proposal	*The primary cause of spills was hydraulic and Stage 2 impact assessments have shown that the asset was having a significant effect on the receiving waterbody, with the waterbody itself currently achieving a good or higher status. Assessment of the potential high-level solutions have indicated that any solution entailed excessive costs for the benefit it provided and thus the asset does not pass the SOAF Cost Benefit threshold and will not progress to detailed benefits assessment.* *Further details are shown below detailing DCWW's plans for storm overflow spill reduction*					

Conclusion and Future Spill Reduction Proposals					
Summary	*Based on the direction from the Welsh Government led Better River Quality Task Force, DCWW Storm overflow spill reduction programme will target the elimination of ecological harm and prevention of adverse ecological impact of any SO.* *With a large programme of assets requiring improvement priority will be given to CSOs having the greatest impact in the most sensitive receiving waters.* *To ensure that the improvement delivered is long term, the improvements for each site will be based on the expectation that water quality upstream of the discharge meets good or high ecological status (GES) irrespective of the actual status of the water.* *This approach has formed the basis of DCWW's portfolio investment plan for Storm Overflows.* *PENNANT STW was Shown to have a High/Very High Impact therefor as set out above based upon our Long Term Delivery Strategy a spill reduction scheem to elimeite this level of impact is Profiled to be delivered before 2040*				
Asset Prioritisation Level	*Priority 2*			**Delivery Predicted Period**	*AMP9*
Asset NEP ID	*N/A*	**Asset NEP Driver Code**	*N/A*	**Detailed Design Predicted Period**	*AMP8*
Progression to Stage 5 In AMP	*No*	*Proposed Solution yet to be taken through detailed design devloped*			

SOAF AGREEMENT					
	Date	**SOAF STAGE**	**Name**	**Contact Details**	**Location of Output**
DCWW Approval	01/06/2024	*Stage 4 - Non CBA*	**Christian Phillips Adams**	christian.phillipsadams@dwrcymru.com	*Email*
Regulator Liaison Date	Click here to enter a date.				
CSO Classification					
Satisfactory	**N**	Unsatisfactory	**Y**	Sub Standard	**N**
		Any operation in dry weather conditions?	**N**	Does not meet modern standards of engineering and aesthetic control for storm overflow structures set out in the British standard BS EN 752:2017 drain and sewer systems outside buildings	**N**

Any operation in breach of permit conditions?	**N**	Does not have sufficient hydraulic capacity compared to accepted minimum design standards	**N**
Any significant visual or aesthetic impact due to solids or sewage fungus?	**Y**	Risks becoming unsatisfactory because discharges have increased beyond the original design due to infiltration, growth and urban creep	**N**
Cause or significantly contributes to a deterioration in the biological or chemical status of the receiving water?	**Y**		
Causes or significantly contributes to failures in bathing water quality standards for identified bathing waters?	**N/A**		
Causes or significantly contributes to failures in shellfish quality standards for identified shellfish waters	**N/A**		
Causes or significantly contribute to failures in water quality standards in coastal and transitional waters?	**N/A**		
Causes pollution of groundwater?	**N/A**		