DERWENT HYDROELECTRIC POWER LIMITED

Issued by	D Needle
Date	13/12/2021
Version	1.0

Scour Valve Operation: Management Plan

Site: Cynwyd Reservoir
Operator: Dopower Limited

Introduction

Derwent Hydroelectric Power Limited (DHPL) is appointed by DoPower Limited to provide Operation and Maintenance (O&M) services to Cynwyd Reservoir.

This document details management of the reservoir scour valve for that site.

Management Plan

The scour valve is not to be opened under normal operating scenarios, except in the following circumstances:

1. Annual testing

It is a recommendation of the reservoir Inspecting Engineer that the scour valve is tested annually[1]. This means that the valve should be fully opened at least once per year and allowed to run clear before being closed again.

In DHPL's operational experience of this site, a 'plug' of silt forms over time that is washed downstream when the valve is first opened. Visible water discoloration has usually cleared shortly after the valve has reached the fully open position. The scour valve handwheel takes twenty-three full rotations (anti-clockwise) to fully open the scour valve, and another twenty-three full rotations (clockwise) to return the valve to the fully closed position. Scour valve testing is anticipated to take two minutes.

The sediment transfer that occurs during this small time period is thought to be negligible: no environmental impact is anticipated. Nonetheless, annual testing is scheduled for the Autumn months when river flows are typically higher, and the dam is likely to be spilling. This reduces any impact of sediment transfer to the Afon Trystion.

[1] REPORT ON AN INSPECTION UNDER SECTION 10(2) OF THE RESERVOIRS ACT 1975, November 2021

A Risk Assessment for this action is provided in appendix 1

2. During emergency scenarios

A Flood Plan is in place to manage scenarios where a breach occurs to the dam, or where damage may be anticipated. That plans out emergency operation practices for the scour valve.

Cynwyd Reservoir is subject to regular maintenance and monitoring. No flooding scenarios are anticipated that might require operation of the scour valve.

3. Other pre-planned and licensed works

Should the operator desire to draw down reservoir water level using the scour valve for any other purpose, this should be subject to a task-specific planning and licensing process. It is anticipated that a Water Discharge Permit would be required prior to any planed operation of the scour valve.

Summary

Planned operation of the scour valve is limited to a very brief period of annual testing. Any other movements of the scour valve will be as an emergency response or subject to task-specific planning and licensing processes.

Appendix 1: Risk Assessment

Site Risk Management Record

Revision Control:
Originator: D Needle Date: 13/12/2021
Reason: Annual Scour Valve Testing
Revision: 1

Likelihood
Rating 0 = Zero to very low
Rating 1 = Very unlikely
Rating 2 = Unlikely
Rating 3 = Likely
Rating 4 = Very Likely
Rating 5 = Almost certain

Severity
Rating 0
Rating 1 = No injury or illness
Rating 2 = First aid injury or illness
Rating 3 = Minor injury or illness
Rating 4 = "3 day" injury or illness
Rating 5 = Major injury or illness
Rating 5 = Fatality, disabling injury etc.

Site	Cynwyd Hydro
Date Inspected	

S = Severity

L = Likelihood

Risk = Likelihood x Severity

Ref.	Task	Hazard	Risk			Immediate Action / Control Measures	Residual Risk			Residual Action	Comment
			L	S	Risk		L	S	Risk		
Health and Safety Aspects											
1.0	Access	Slips and trips	2	5	10	Maintain a tidy site. Do not store materials or tools on walkways or access routes. Hold on to hand rails and do not cross safety barriers when crossing the dam.	1	2	2		
1.1	Access	Public use of the downstream reach of the Afon Trystion	3	5	15	Undertake a visual inspection of the immediate downstream reach to ensure no people are likely to be affected by an increase in river flows.	1	5	5		Natural and man-made ponds in the immediate downstream reach will attenuate the flow variation to lower reached of the Afon Trystion.
1.2	Access	High water level over dam crest	4	5	20	Do not attempt to cross the dam crest if water depth of velocity make walking in wellington boots hazardous.	0	5	0	Foot access should instead be made via the Secondary Dam Access point.	The safe wading depth should be assessed on site. As a guide, it is anticipated that maximum safe wading depth will be around 150mm.
2.0	Manual Handling	Muscular damage.	2	3	6	All staff to have manual handling training, wear grip enhancing gloves; ensure a sturdy standing position to operate the valve.	1	1	1	Consider the impact of weather conditions. For example, wet or icy conditions could increase the risk of slipping when operating the valve.	
3.0	Environmental	COVID-19	3	5	15	Observe social distancing practices.	1	5	5	Anyone displaying symptoms of COVID-19 is requested to self-isolate and avoid attending site.	
Environmental Risks											
1.0	Reservoir Drawdown	Sediment transfer	1	3	3	Abort testing and close valve if signs of failure occur.	2	2	4	If the drive shaft or handwheel fail it may still be possible to operate the valve itself. The disused scour valve is also retained in the open position. It may be possible to close the disused valve in an emergency scenario.	Possible occurrence if the scour valve fails during testing
1.1	Reservoir Drawdown	Release of stratified water	3	4	12	Minimise scour valve test time - aim two minutes in total. Testing to be completed during Autumn months. This increases chances that the dam will be spilling, diluting any stratified water. Cooler ambient conditions also reduces water stratification.	2	1	2		
1.2	Reservoir Drawdown	Scouring, damage to structures or risk to animals caused by artificially increased flows in the downstream watercourse	0	0	0	Scour flow rate is well within the normal seasonal flow rates.	0	0	0		The water course is ordinarily subjected to flow fluctuations of 234lps in relation to hydro operation.
1.3	Reservoir Drawdown	Release of fish	2	2	4	Minimise scour valve test time - aim two minutes in total.	1	2	2		Coarse fish (the general population of the reservoir) are not expected to be drawn unintentionally through the scour valve during testing.
1.5	Reservoir Drawdown	Affect on downstream environmental or other protected designations	3	3	9	Minimise scour valve test time - aim two minutes in total.	1	2	2		River Dee at the confluence wit the Afon Trystion is designated SAC and SSSI. There are no designations on the Afon Trystion.