

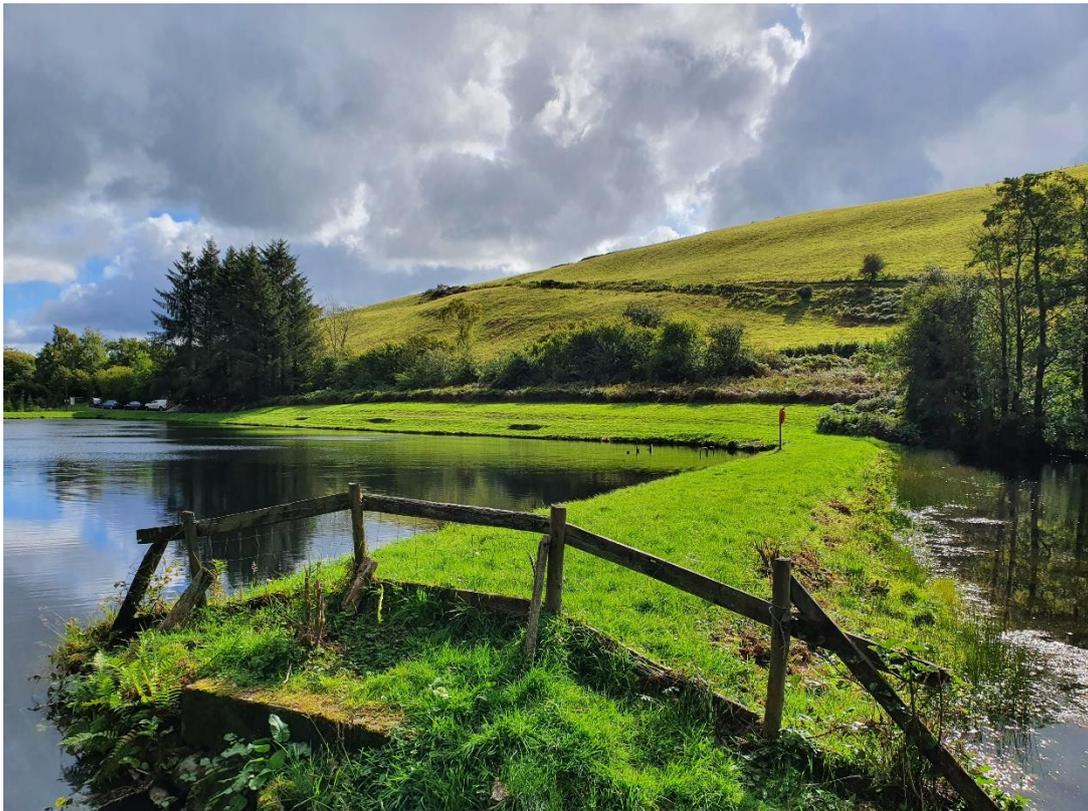


## North Wales Reservoir Discontinuance Project

Scheme Overview – Cilcain Reservoirs 1 & 2

[Overview version 2]

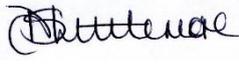
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**APPLICATION FOR IMPOUNDMENT LICENCE**

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## Summary

Dŵr Cymru Welsh Water (DCWW) has identified the following four reservoirs in North Wales for discontinuance in accordance with the requirements of the Reservoirs Act 1975.

- Llyn Bran Reservoir
- Brithdir Mawr Reservoir
- Cilcain Reservoirs No.1 and No.2
- Penmaenmawr – Mountain Reservoir

These reservoirs were identified following a RARS2017 report prepared by ARUP as part of a wider portfolio risk assessment on behalf of DCWW. It is understood that additional sites may follow in due course.

This document summarises the discontinuance scheme proposal for **Cilcain Reservoirs 1 & 2**.

The 'discontinuance' of a reservoir, under Section 13 of the Reservoirs Act 1975 requires an owner to reduce a reservoir's water storage capacity to a volume that is less than 10,000 m<sup>3</sup> (in Wales). This reduction can be achieved either by creating a large notch in the dam, or by complete removal of the dam.

Stillwater Associates were subsequently commissioned to undertake a discontinuance feasibility assessment for Cilcain Reservoirs 1 & 2. A systematic approach was followed for the assessment of the reservoirs. First, a visual inspection was carried out at the site to determine the current condition of the dams and appurtenant structures and to become familiar with the general surrounding landscape. A number of studies and analyses were then undertaken to determine appropriate discontinuance options.

The studies included detailed technical assessments of options to retain the reservoirs in their current form, and options to discontinue the reservoirs in accordance with the requirements of the Reservoirs Act 1975. An archaeological assessment of the site and a Preliminary Ecological Appraisal was also carried out to inform the need for mitigation measures, and to identify potential enhancement opportunities. These options were presented to DCWW in a feasibility study report in 2019.

This report serves to provide a short summary of the Cilcain Reservoirs 1 & 2 discontinuance option and includes extracts taken directly from the discontinuance feasibility assessment report prepared by Stillwater Associates in 2019.

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### 1. Site Location

Cilcain Reservoirs 1 & 2 are situated in the County of Flintshire, approximately 1.5km southwest of Cilcain and 3.3km west of Pantymwyn as shown in Figure 1 below.

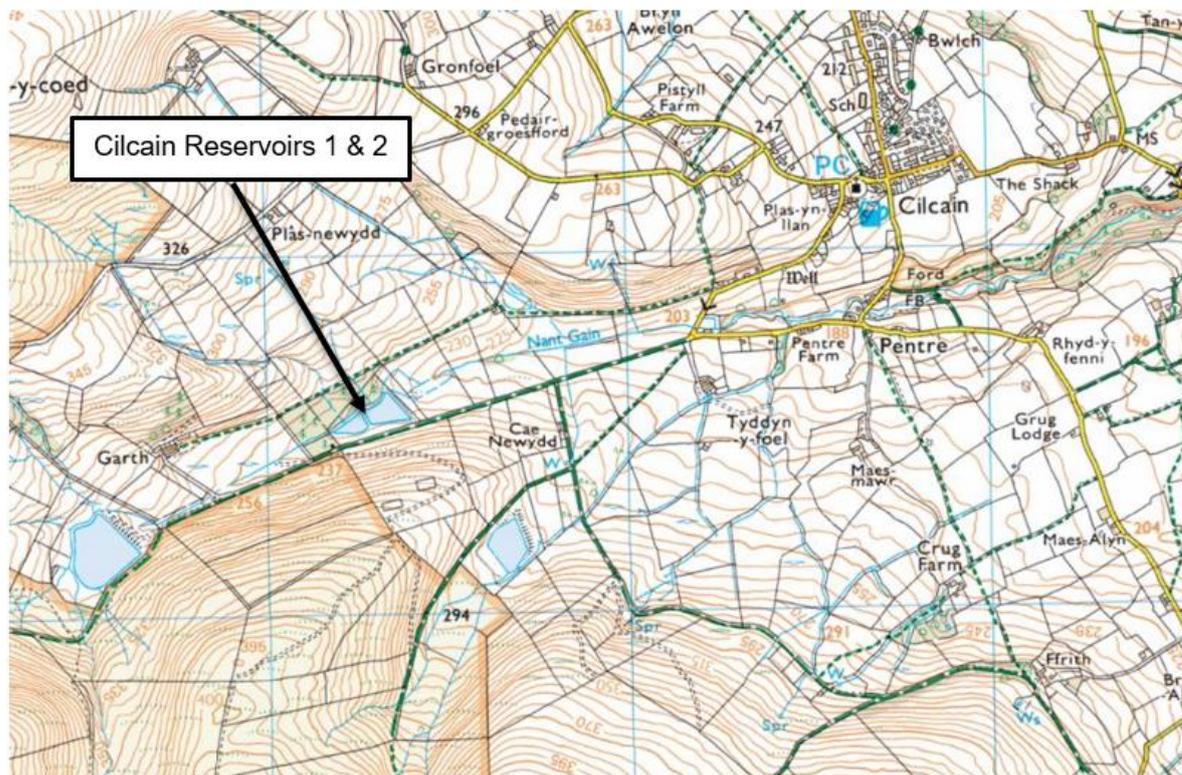


Figure 1: Location of Cilcain Reservoirs 1 & 2 (courtesy of [www.bing.com/maps](http://www.bing.com/maps))

### 1.2 Recommended Option 2: Discontinuance

The recommended option is for the partial removal of the lower reservoir (Cilcain No.2) embankment by excavating a full-height notch, at least 10m wide at its base, to ensure large debris, such as fallen trees can pass through the breach during a flood event. The entire dividing embankment between the reservoirs, Cilcain No.1 embankment, will be removed. The notch created in the lower embankment will ensure the entire combined reservoir basin drains without impounding water.

Complete removal of the entire lower embankment structure was discounted during the feasibility stage as it was concluded that the substantially higher cost of this approach would be disproportionate to any additional benefit achieved.

Under this option the excavated embankment material from both embankments will be relocated and landscaped to form a new river corridor through the reservoir basin, with the valley returned to its pre-reservoir state as far as possible. This approach will also avoid the need to remove material from the site.

The original natural stream through the reservoir basin will be excavated, with careful silt management, retaining silt on site as part of the landscaping scheme.

Control of normal flows up to the 1 in 100year flood event will be achieved by means of a low flow channel incorporated into the main notch through the lower embankment. The low flow channel will have a base width of approximately 3m, side slopes of 1V:2.5H and an approximate depth of 0.5m.

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For this option it is proposed that all the existing pipework be removed.

The main overflow structure, by-wash channel and downstream masonry channel will be retained.

Table 1 below provides a summary of the preferred discontinuance option, important considerations and the estimated scheme implementation costs.

A sketch of the preferred option is presented in Figure 2.

**Table 1: Cilcain Reservoirs 1&2 - important considerations relating to the discontinuance option**

Consideration	Option 2: Discontinuance
Summary of option	Remove entire dividing embankment and a section of the lower embankment by excavating a full-height notch down to original ground level to reinstate the river to its pre-reservoir course through the site of both reservoirs.
Technical constraints (dam structure and stability, overflow capacity and emergency drawdown requirements)	<i>None – removal of dam in both cases is technically straightforward.</i>
Silt Management	<i>Formal silt management works required throughout entire basin of both reservoirs, including:</i> <ul style="list-style-type: none"> <li>• <i>Downstream silt trap during discontinuance works;</i></li> <li>• <i>Excavate silt to form channel through the site of the reservoir basin;</i></li> <li>• <i>Contain the silt adjacent to the channel by constructing bunds from excavated embankment fill material;</i></li> <li>• <i>Use existing stone pitching to form pools and riffles within channel.</i></li> </ul>
Downstream Flood Risk	<i>No change to downstream flood risk</i>
Access	<i>Construction of formal access track required and subsequent removal following completion of the works.</i>
Amenity, Landscape and Biodiversity	<i>Change in landscape through removal of both reservoirs and returning river to pre-reservoir course through the middle of the reservoirs. Removal of all the upper dividing embankment and the majority of the lower main embankment via notching – considered to be not detrimental to landscape. Preliminary Ecological Appraisal indicates likely adverse impacts unless appropriate mitigation measures implemented – requires consultation with NRW and Flintshire CC, and further ecological assessments and surveys.</i>
Archaeology and Heritage	<i>No adverse impacts anticipated in terms of archaeology and no requirement for an archaeological watching brief.</i>
Safety	<i>Additional safety signage should be installed to minimise long term public safety liability.</i>
Planning and Consents	<i>Planning permission may be required, subject to pre-planning consultation.</i>
Ongoing Monitoring and Maintenance	<i>Reservoir removed from Reservoirs Act 1975. Infrequent visits to monitor estate interests.</i>
Total Cost (DCWW Cost Range)	<b>£1,070,000</b> <b>(£1m – £2m)</b>

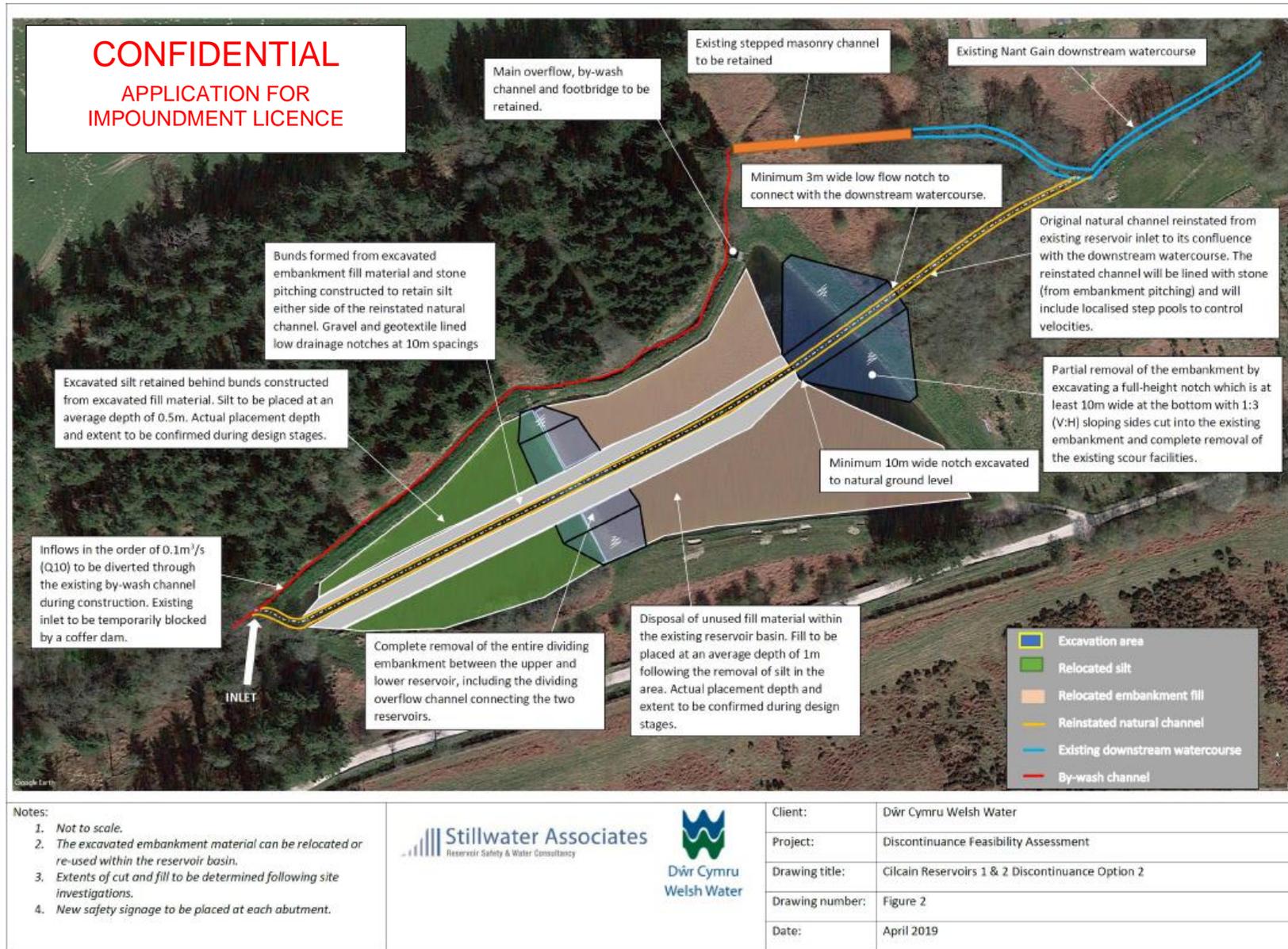


Figure 2: Cilcain Reservoirs 1 & 2 discontinuance Option 2