

Annexe 11 – Carr Bottom, DP2022-NE0270016032

A. Summary of the proposal

Yorkshire Water Services Limited (YW) is applying for drought powers under the Water Resources Act 1991 (as amended by Environment Act 1995) to replace the conditions under the Burley-in-Wharfedale Urban District Water Act 1899.

YW hold an abstraction licence (number 2/27/19/009) which authorises abstraction of 409,149 cubic metres per year from Carr Bottom Reservoir for the purpose of public water supply.

Under the Burley-in-Wharfedale Urban District Water Act 1899, YW are required to provide a compensation release of not less than 85 cubic metres per day from the Carr Bottom Reservoir to the Carr Beck (see Figure 1). The proposed Drought Permit application is to reduce the compensation release to 42.5 cubic metres per day, with a further reduction to 28 cubic metres per day if regional reservoir stocks were below the Drought Control Line for four consecutive weeks or more, as defined in the Yorkshire Water Drought Plan.

The Drought Permit has been applied for due to an exceptional shortage of rainfall in the area. The proposed reduction of the compensation release will help to conserve water levels in the Carr Beck Reservoir to maintain public water supply during winter 2022 – 23 and increase the chance of returning to normal reservoir levels by April 2023.

The proposed reduction in compensation release has been requested until 31 March 2023.

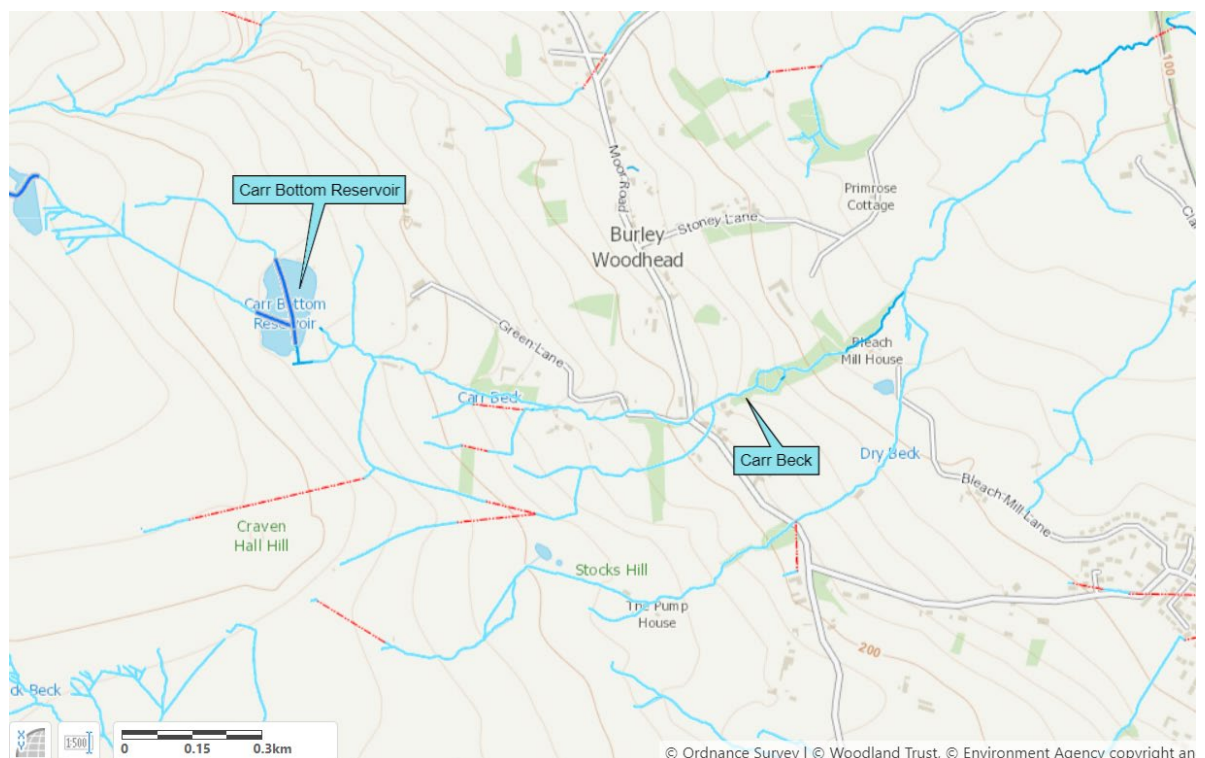


Figure 1: Carr Bottom Reservoir and Carr Beck

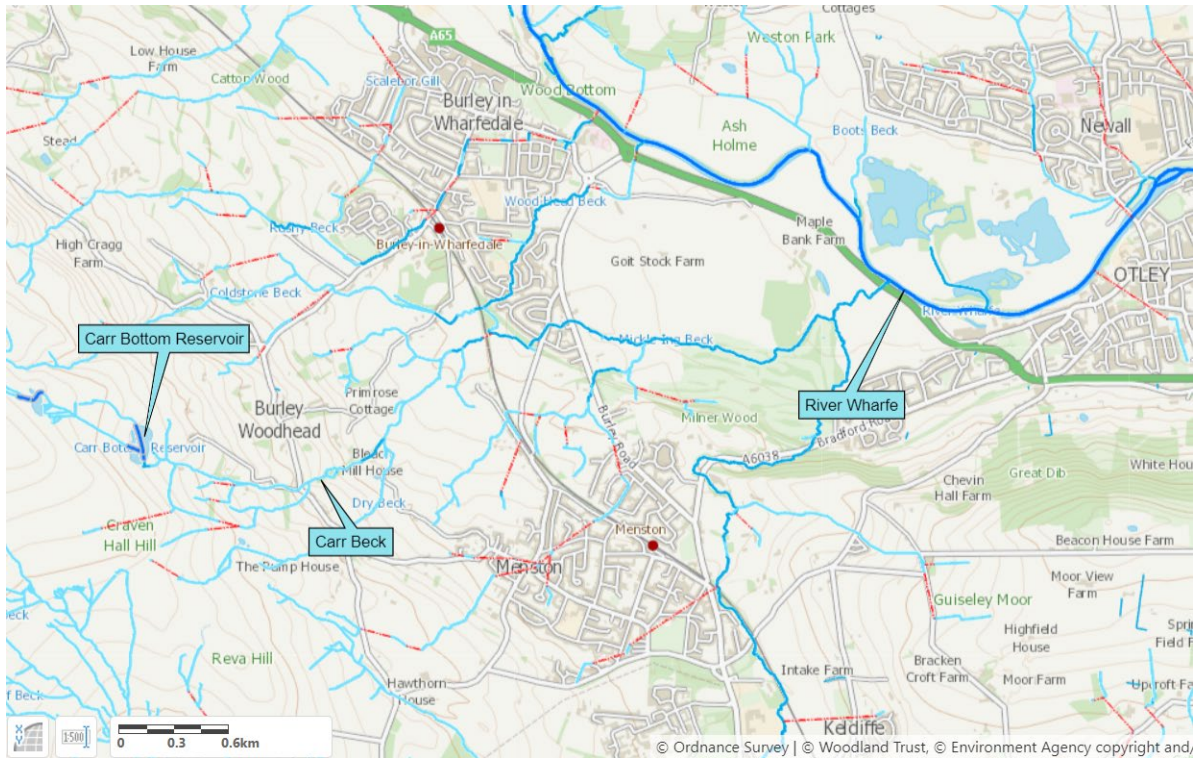


Figure 2: Location of site

B. Details of proposal

Details of the existing and proposed compensation discharge are below:

Compensation release details	Existing details	Drought permit application changes
Location of discharge	Carr Bottom Reservoir to Carr Beck	No change
Duration of drought permit	N/A	Up to and including 31 March 2023
Point of discharge	SE 14732 44559	No change
Rate of compensation release	85 cubic metres per day	42.5 cubic metres per day <u>If reservoir levels below Drought Control Line:</u> 28 cubic metres per day

Drought permit further conditions

See section G for recommendations of the drought permit.

C. Quantities

There are no abstraction quantities associated with this application for a drought permit. Please see sections A and B for details of the existing and proposed compensation release quantities.

D. WFD

This application is outside the Abstraction Licensing Strategy process. This is because it relies on drought powers to address exceptional circumstances. However, the proposal still needs to be Water Framework Directive (WFD) compliant. The proposal will be assessed against the WFD statuses, including identifying the risk of any temporary deterioration of status.

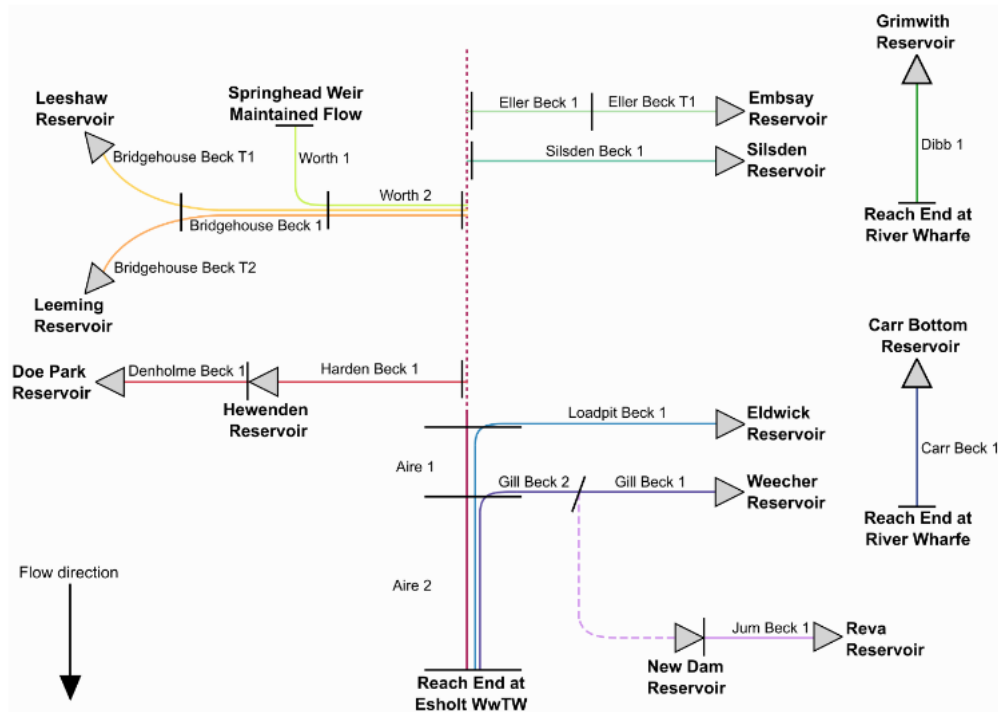


Figure 3: North West Area reservoirs drought permits reach schematic

Carr Bottom Reservoir is hydrologically linked to the following reach (as shown above in Figure 3):

- Carr Beck 1 - Wharfe from Hundwith Beck to River Washburn, (GB104027064258).

The corresponding WFD waterbody has therefore been assessed in relation to the Carr Bottom Reservoir drought option.

Wharfe from Hundwith Beck to River Washburn, GB104027064258

This reservoir is not directly within a WFD waterbody, so we have used the waterbody provided by YW in the EAR. The Wharfe from Hundwith Beck to River Washburn, (GB104027064258) is classed as heavily modified. These are water bodies where there is a significant risk of failing to achieve a good ecological status because of modifications to their hydro-morphological characteristics. Therefore, they have a target of achieving Good Ecological Potential (GEP) rather than Good Ecological Status (GES). For heavily modified water bodies, flow is the first element assessed as part of the classification. If flow standards are passed, then potential is based on a combination of mitigation measures and 'non-sensitive' quality elements. For river water bodies, these consist of the physico-chemical, specific pollutants and phytobenthos elements. If flow standards fail, then potential is based on the worst result of either the mitigation measures assessment or any of the quality element assessments.

Consideration	Status		
	Baseline status (2015)	Cycle 2 current status (2019)	Cycle 2 Objective
Overall WB status	Moderate (Quite Certain)	Moderate (Quite Certain)	Good by 2027
Ecological potential	Moderate (Quite Certain)	Moderate (Quite Certain)	Good by 2027
Fish	-	-	-
Invertebrates	High	High	Good by 2015
Macrophytes	Good	Moderate (Very Certain)	Good by 2027 (Combined)
Phytobenthos	Moderate (Quite Certain)	Moderate (Quite Certain)	Good by 2027 (Combined)
Hydrological regime	Supports Good	Supports Good	Supports Good by 2015
Mitigation measures	Moderate/Less	Moderate/Less (Uncertain)	Good by 2027
Physico-chemical	Good	High	Good by 2015
Chemical	Good	Fail (Uncertain)	Good by 2015

Table 1: Wharfe from Hundwith Beck to River Washburn, GB104027064258 (Heavily modified)

Reasons For Not Achieving Good:

Ecological Potential –The ecological potential is at moderate status and does not meet Good WFD status due to several contributing factors explained below.

Macrophytes and Phytobenthos – The WFD status for macrophytes is moderate (very certain) and the WFD status for phytobenthos is moderate (quite certain). This is due to suspected point and diffuse sources of pollution including phosphates from the sewage industry and poor nutrient management within agriculture.

Mitigation measures – The mitigation measures assessment is classed as being at moderate / less (uncertain) due to physical modifications of the waterbody as a result of urbanisation. The drought permit will not exacerbate this particular classification as it will not result on changes to the physical modification structures.

Chemical – The chemical WFD status is Fail (uncertain). This is due to the levels of mercury and its compounds and Polybrominated diphenyl ethers (PBDE) for which measures have been delivered to address the reasons for failure and the levels of Perfluorooctane sulphonate (PFOS)m, which is pending investigation.

WFD objectives assessment:

- The objectives of Good by 2027 indicates the long-term ambition for the waterbodies as it is technically feasible to fix the issues, but these were not funded in the Cycle 2 plan. In the Cycle 3 plan these objectives will be revised and if the required fixes are still not funded the deadline could be extended again.
- Where we have a baseline (2015) status of 'Good' then our objective has been set as Good by 2015. This is because the waterbody is already meeting its default objectives, and nothing less than good can be predicted as this would go against the directive.

Risk of deterioration of elements:

Fish – The WFD status for fish has not been assessed. YW's EAR states that the impacts to the fish population are assessed as having a major impact magnitude for brown trout, and moderate impact magnitude for bullhead. Considering the hydrological impacts and the risk of water quality deterioration in the reach, the risk to the WFD status the fish component of the WFD GB104027064258 Wharfe from Hundwith Beck to River Washburn (associated with Carr Beck 1) is considered to be **moderate**, however, there are uncertainties relating to the fish community within the impacted reach as limited survey data is available.

Invertebrates – The WFD status for invertebrates is currently high. YW's EAR states that the potential changes to river flows is likely to result in major reduction in flow and will lead to a major reduction in wetted width and depth which will directly reduce the overall habitat availability within the reach. The macroinvertebrate community shows a good level of diversity, and consequently, loss of habitat may further reduce the diversity of the community as a result of habitat loss for certain species. Furthermore, the increased friction between flow and channel bed may reduce flow velocity, as the macroinvertebrate community is sensitive to flow velocity reductions, as indicated by high LIFE scores. This may reduce the suitability of the reaches to species which require high flow velocities. The community is considered to be sensitive to water quality pressures as indicated by good WHPTASPT EQRs, however the water quality changes as a result of the implementation of the drought option are predicted to present a minor risk. Furthermore, there are no significant flow pressures, either abstractions or discharges, influencing flow in Carr Beck 1. The combined physical environment changes (river flows, river habitat and water quality) as a result of the implementation of the drought option are predicted to present a major risk to the macroinvertebrate component of the GB104027064258 Wharfe from Hundwith Beck to River Washburn waterbody (associated with Carr Beck 1). The duration of impacts could be up to 6 months. However, the macroinvertebrate community recovery is expected to be relatively quick due to effective re-colonisation strategies in macroinvertebrates. Therefore, the risk to deterioration of the WFD status of the waterbody is considered to be **moderate** however, there are uncertainties relating to the invertebrate community within the impacted reach as limited survey data is available.

Macrophytes and Phytobenthos – This element is screened out of the impact assessment as neither are deemed to be impacted by changes in flow. Wetted width reduction would not result in a deterioration of status due to the way monitoring is carried out. Reduced dilution of phosphate caused by drought option implementation may have an impact if P deterioration is predicted but would be

temporary and unlikely to impact on either status. We don't believe this drought option poses any risk to the deterioration of macrophyte or phytobenthos status.

Hydrological regime – The WFD status for the hydrological regime currently supports good. YW's EAR states that During the implementation of North West Area drought options, storage in Carr Bottom Reservoir is likely to be below top water level and therefore the reservoir compensation flow represents a high proportion of the flow in this reach. A reduction of up to 0.06MI/d in the statutory compensation release rate of 0.09MI/d represents a 67% reduction in the flow at the upstream end of the reach, regardless of the time of year. During a winter refill period when catchment flows are generally increasing, there may be some limited flow accretion along the reach so that the percentage flow reduction is less at the lower end of the reach. However, the flow reduction at the top of the reach will remain at 67% until the reservoir reaches top water level and begins to spill again. The hydrological impact of drought options on Carr Beck 1 is therefore assessed as **major** for both a summer/ autumn period and any winter refill period while drought options remain in place. There is one potentially significant flow pressure influencing flow in Carr Beck 1, a golf club spray irrigation licence for 0.024MI/d daily maximum with multiple abstraction locations.

Mitigation Measures – The drought permit will not exacerbate this particular classification as it will not result in changes to the physical modification structures.

Physico-Chemical – The physico-chemical WFD status is currently high. YW's EAR states that there are no sample locations in Carr Beck 1. As such the average pH and maximum temperatures cannot be determined for this reach. In order to assess the water quality, the neighbouring Gill Beck catchment has been used as a representative example due to its similarities as a catchment. There are no significant continuous or intermittent discharges into Carr Beck 1 and no significant intermittent pressures. Therefore, this drought option is considered to present a minor risk to water quality.

Chemical – The EAR has not assessed the specific chemical parameters that are the cause of failure in the EA's catchment planning system. However as there is a risk to physico-chemical parameters then it is reasonable to state there may be a risk to chemical parameters due to the same pathway. Although there is a risk of potential further deterioration to this element, it's considered that the mitigation measures will be sufficient to protect against this.

Risk of Deterioration: A summary for all Reaches

Although YW EAR identifies that there is a possible moderate or major risk to certain WFD elements as a result of this drought option (Fish, Invertebrates, Physico-chemical, Chemical), we are satisfied that the monitoring and mitigation conditions included within the drought permit mitigates any possible risk of deterioration in the status of WFD elements (Fish, Invertebrates, Physico-chemical, Chemical). If the monitoring schedule identifies any impacts to the WFD elements as a result of this drought permit, then reactive mitigation will be carried out, dependent on the problems identified. Additionally, should any environmental problems be identified, YW will increase their compensation flows as laid out in the relevant permit.

E. Impact on ecology and conservation sites

Conservation sites

The sites, species and habitats listed in the table below are within the 5 km reach from the point of the compensation release at Carr Bottom Reservoir to the confluence with the River Wharfe.

The River Aire downstream of that confluence has potential to be cumulatively affected by reservoirs in YW's North West area reservoir group. Please refer to the main determination report for this group of reservoirs for further details.

Nearest conservation sites (distance searched – 5 km downstream)			
Designation types	Name of site	Distance downstream	Potential Impact
Special Areas of Conservation (SACs)	South Pennine Moors	Within site	Negligible – there is no hydrological connectivity between the site and Carr Beck so there is no anticipated impact.
Ramsar sites	None	N/A	N/A
Special Protection Areas (SPAs)	South Pennine Moors	Within site	Negligible – there is no hydrological connectivity between the site and Carr Beck so there is no anticipated impact.
Sites of Special Scientific Interest (SSSIs)	South Pennine Moors	Within site	Negligible – there is no hydrological connectivity between the site and Carr Beck so there is no anticipated impact.
Groundwater Dependent Terrestrial Ecosystems (GWDTEs) that are not designated as SSSIs	N/A as surface water application	N/A	N/A
National Nature Reserves (NNRs)	None	N/A	N/A
Local Nature Reserves (LNRs)	None	N/A	N/A
Ancient Woodland	None	N/A	N/A
Scheduled Ancient Monuments (SAMs)	None	N/A	N/A

Local Wildlife Sites (LWSs)	River Wharfe, Otley & Mid Wharfedale/Wetherby	5 km	Not sensitive - assessed in Environmental Assessment Report (EAR) Table B2.107 Likely to be in connectivity with impacted reach and support aquatic receptors. A typical lowland river. Unlikely to be impacted, due to the relative size of the River Wharfe compared to Carr Beck.
National Parks	None	N/A	N/A
Areas of Outstanding Natural Beauty (AONBs)	None	N/A	N/A
Heritage Coast	None	N/A	N/A
Restoring Sustainable Abstraction (RSA) Programmes	None	N/A	N/A
Protected Species	European Eel migratory route; Atlantic salmon migratory route	5 km; 5 km	<u>Eels</u> : No impact. Very small stream, well upstream of tidal Ouse. No record of them in surveys. <u>Salmon</u> : No impact. The watercourse is more suited to brown trout, with salmon tending to prefer spawning in larger tributaries. NB: there are two survey sites on this watercourse, with average widths of 1.3m and 1m respectively.
Protected Habitats	Upland heathland; Deciduous woodland	At site; 1 km	Unlikely to be in connectivity with impacted reach or support aquatic receptors
Invasive Non-native Species	New Zealand pigmyweed	Within Carr Bottom Reservoir	The implementation of this drought option is not anticipated to increase the spread of invasive non-native species.

Table 2: Conservation screening results

Designated sites

The Carr Bottom Reservoir is located within the South Pennine Moors SAC/SPA/SSSI site boundary. The Carr Beck flows towards the south east and away from the site.

A Habitats Regulations Assessment 1 (HRA 1) has been completed and concluded that there is no likely significant effect as a result of the proposed drought permit. An Appendix 4 has also been completed and concluded that the proposal is not likely to damage the site. The HRA 1 and Appendix 4 were sent to Natural England for consultation on 15 September 2022. Natural England responded on 27 September 2022 and confirmed that they agree with our conclusions and have no concerns.

Monitoring and mitigation

YW will be required to carry out the following monitoring and mitigation measures (which will be included in Appendix 1 and 2 of the Drought Permit):

Monitoring:

- IDMON_1: Surveillance walkover surveys of habitat quality and ecological stress, recording signs of environmental problems at:
 - Carr Beck between SE 16017 44642 and SE 16310 44972.
- If the monitoring identifies signs of environmental distress, the following actions shall be undertaken by the water company:
 - upon finding any signs of environmental problems the water company shall notify the Agency in writing and by telephone on 0800 80 70 60 and shall provide details of the signs of distress and the location;
 - the water company shall undertake a remedial course of action to address the signs of environmental problems, as directed in writing by the Agency.

Mitigation:

- If, upon being notified of any signs of environmental problems, the Agency gives written notice that there is a disruption to the ecology, the water company shall increase compensation flow from Carr Beck and River Wharfe at National Grid Reference SE 14732 44559 to a rate of not less than 85 cubic metres per day, or a lesser quantity if agreed in writing by the Agency.
- The increase in compensation flow to the Carr Beck and River Wharfe shall continue until the Agency serves a subsequent written notice stating that the reduction in compensation flow in accordance with conditions of this drought permit may be resumed.
- The changes to the compensation water specified in conditions of this drought permit shall be made in a steady and controlled manner at a rate so as not to cause any flooding of land or disturbance to water users downstream or any adverse effects on the quality of water in the inland water or any adverse impacts on the ecology of the inland water or dependent ecosystems.
- **Freshet flows condition**
If, upon being notified by the Agency, or upon discovering through environmental monitoring, or through other evidence that an increase in compensation flow is needed to support riverine ecology and/or support trout and salmon species, as identified in the Water Company Environmental Monitoring Plan North West Area Appendix, termed IDMIT_9 and IDMIT_17, the Water Company shall increase compensation flow at a time, to a rate and for a duration, as directed in writing by the Agency, and release from Carr Bottom Reservoir to Carr Beck at National Grid Reference SE 14732 44559, or other location as agreed in writing by the Agency.

F. Measurement

The discharge from Carr Bottom Reservoir is authorised under the Burley-in-Wharfedale Urban District Water Act 1899. There will be no change to the way the discharge is measured as part of this drought permit.

G. Recommendations

Based on the conclusions of the main determination report (section 14), the Agency has decided to grant a drought permit under section 79A of the Water Resources Act 1991 subject to conditions, as drafted and attached to this report. The drought permit will suspend the provisions of the Burley-in-Wharfedale Urban District Water Act 1899 during any period in which YW can abstract under the conditions of the drought permit.

The drought permit will be time limited to 31 March 2023 and will include the following conditions along with appendices detailing the monitoring and mitigation requirements.

Condition	Source of the condition wording
1.1 (i) Compensation Flow	Compensation flow reduced. Condition has been legally approved.
1.2 (ii) Compensation Flow	Compensation flow when regional reservoir stocks are below the Drought Control Line (as defined in YW Drought Plan 2022) for more than four consecutive weeks. Condition has been legally approved.
The following conditions will be included for environmental monitoring and mitigation. They have all been legally approved.	
2.1	Condition requiring YW to follow the monitoring set out in Appendix 1 of drought permit.
2.2	Mitigation actions to be undertaken by YW if environmental problems identified.
2.2.1 (i)	YW must notify Agency of any environmental problems.
2.2.1 (ii)	YW must formulate remedial course of action to address problems.
2.2.2	YW must increase compensation flow.
2.3	All changes to compensation flow must be made in a steady and controlled manner.
2.4	Freshet flows condition.
3.1	Drought permit only relied upon if Temporary Use Ban restrictions imposed and in force.

Table 3. Recommendations of drought permit