ENLARGED COTTER DAM & MURRUMBIDGEE PUMP STATION ENVIRONMENTAL FLOW PLAN

INTRODUCTION

ACTEW's key regulatory document for the provision of environmental flows is the Licence To Take Water (the Licence), issued under the *Water Resources Act 2007 (ACT)*. This Licence outlines what environmental flows are to be protected in ACTEW's water supply catchments (Cotter, Googong and Murrumbidgee), and what the required protection volumes are. The Licence is granted by the ACT Environment Protection Authority (ACT EPA) and is guided by the ACT *Environmental Flow Guidelines 2006*. The Licence only allows for water to be taken by ACTEW for the purposes of urban water supply and is covered by Water Access Entitlements held by ACTEW.

The Licence defines different levels of environmental flow protection at different levels of water restrictions being experienced by the ACT. In times of water shortage, the water protected for the environment is reduced at the same time as the community's water availability is reduced. That is, the higher the stage of water restrictions being experienced, the lower the levels of environmental flows required to be protected. Conversely, environmental flows are at their highest when the ACT is not in any water restrictions (i.e. Permanent Water Conservation Measures – PWCM). In this manner, the Licence balances the water resource needs of the ACT and surrounding population and the natural environment.

In addition to the Licence requirements, the Commonwealth Department of the Environment Minister's approval of the Enlarged Cotter Dam also required specific environmental flows to be released below the dam.

COTTER RIVER ENVIRONMENTAL FLOWS BELOW THE ECD

The 34ML/d environmental flow (12 month rolling average) requirement of the Commonwealth is currently met through the provision of base flows at 40ML/d, with a drop to 20ML/d at the end of each month, in order to provide ecologically crucial flow variability.

Environmental flow science clearly demonstrates that the timing and volumes of release is more important than volume alone. This concept is clearly illustrated in the ACT *Environmental Flow Guidelines*. Based on this concept, ACTEW's environmental flow management below Cotter Dam, in addition to the daily regime described above, is to:

- provide a peaking flow of at least 100ML/d to the Cotter River below ECD every second month
- for one of the above flows per year providing a peak of 150ML/d (minimum), between mid-July and mid-October
- only releasing the above flows during Permanent Water Conservation Measures (PWCM) and Stage 1 Water Restrictions in order to protect security of supply.

These flow rates will be delivered in a ramp-up/ramp-down fashion to replicate a natural hydrograph curve.

The provision of these flows will have the ecological objective of clearing riffles of fine sediments, thereby minimising bed armouring, and providing habitat spaces for aquatic organisms, which form part of the aquatic food chain for larger species (e.g. fish). Further, the release of the larger peaking flow between mid-July and mid-October will coincide with the timing of spring natural high flows experienced in this region. The increase in the provision of riffle maintenance flows in the Cotter River will have direct improvements on the aquatic ecosystem in that reach.

ENVIRONMENTAL FLOWS IN THE MURRUMBIDGEE RIVER BELOW THE JUNCTION WITH THE COTTER RIVER

ACTEW extracts water from the Murrumbidgee River below the junction with the Cotter River at the Murrumbidgee Pump Station. Environmental flows in the Murrumbidgee River are protected from abstraction at the Murrumbidgee Pump Station (MPS) by the ACT regulator (ACT EPA).

ACTEW's environmental protections at the Murrumbidgee River are to:

a. provide peaking flows below Cotter Dam, flowing in to the Murrumbidgee River above MPS as described above
b. increase protection of flows at MPS to the 80th percentile monthly flow in months November – May, and the 90th percentile monthly flow in June – October inclusive, during Permanent Water Conservation Measures (PWCM) and Stage 1 Water Restrictions (measured at Mt MacDonald), in order to protect security of supply.

The 80/90th percentile flows are supported through the *Environmental Flow Guidelines* for the Murrumbidgee River; and reflect the significant differences in natural flow volumes between the summer and winter months. Due to the larger volumes of water naturally present during the wetter months of June to October, the 90th percentile flow values for these months often exceed the 80th percentile volumes for the drier mid-July and mid-October months.

Table 1 below shows the environmental flow protection volumes at the Murrumbidgee Pump Station.

Table 1 – Updated environmental flow volumes to be protected at MPS

Month	%ile	ML/d
January	80th	76
February	80th	69
March	80th	54
April	80th	65
May	80th	73
June	90th	122
July	90th	193
August	90th	227
September	90th	312
October	90th	230
November	80th	276
December	80th	105

It can be seen from Table 1 above, that the increase in levels of environmental flow protection at MPS (from the previous 20ML/d or 67%, whichever is greater, during PWCM or 20 ML/day during Stage 1 and greater) has resulted in significantly greater levels of minimum environmental flow protection.

The protection of low flows (80-90th percentiles) in the Murrumbidgee is accepted as more ecologically important than higher flows. Further, high flows in the Murrumbidgee River are of such magnitude, that the pump capacity of MPS pump station is insignificant. The updated environmental flow protection rules significantly increase the protection of the low flows. For example, under very low flows (90th %ile) the availability of water for extraction reduces by an average of 37ML/d (Table 3). Table 3 also shows the distinct increase in protected flows as a result of the new protected flow rules.

The increased protection of environmental flows at MPS through the application of the 80/90th %ile rule is supported by the Environmental Flows Technical Advisory Group. The group considered that the application of this rule at the MPS would likely enhance conditions for less adverse impacts on Murray Cod ecology in that Murrumbidgee River reach.

SUPPLY OF POTABLE WATER

The proposed plans to increase environmental flow protection at the Cotter and Murrumbidgee rivers needs to be balanced against ACTEW's capacity to provide a secure drinking water supply to the residents of Canberra and Queanbeyan. Consequently, ACTEW does not consider it prudent to apply these increased rates of protection beyond Permanent Water Conservation Measures and Stage 1 water restrictions.

During water restrictions that exceed Stage 1 (i.e. Stage 2 or greater) environmental flows will be delivered in accordance with the ACT Environment Protection Agency regulations, which have established mechanisms to balance ecological and potable water supply needs. During the millennium drought, environmental flows were closely monitoring and adapted by the ACT EPA and the Environmental Flows Technical Advisory Group (EFTAG), which includes representatives from ACTEW, the ACT EPA, the ACT Government and the University of Canberra.

The Commonwealth Department of the Environment, through the Enlarged Cotter Dam Conditions of Approval 2.e. already indicate the Department's support of EFTAG as a suitable mechanism to manage environmental flows, and require ACTEW to report on compliance with EFTAG advice. ACTEW will use this reporting mechanism to advise the Department of the Environment how environmental flows are managed during Stage 2 or greater water restrictions, should they arise.