

IN THE MATTER of the Resource Management Act 1991

AND

IN THE MATTER of applications for water permits to abstract water, land use consents to excavate and disturb the bed of the Homestead Stream, the construction and operation of a dam and discharge of water from a dam for the proposed Forevan and Winterberg activities

BY ROBERT HAY ROBERTSON
Applicant

TO ENVIRONMENT CANTERBURY
Local Authority

**EVIDENCE IN REPLY OF ROBERT JAMES HALL
IN SUPPORT OF THE APPLICATIONS BY ROBERT HAY ROBERTSON**

NORTH SOUTH ENVIRONMENTAL LAW

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1. I have prepared this evidence in response to Commissioner Ryder's request for further information concerning the changes that might occur within the Winterberg Dam's storage area.
2. Based on the conceptual dam dimensions provided in my evidence in chief I have estimated a storage volume / head and surface area / head relationship for the Winterberg Dam. These relationships are then used to estimate what changes might occur within the dams storage compartment over an irrigation season 1 October through to 31 April inclusive assuming that the dam is full to maximum service level at the start of that season, that no significant inflow occurs during that season, that the seasonal drawoff is 3.37 million cubic metres of water, and that seepage and evaporation losses will occur. I have allowed for a combined loss from evaporation off an average dam surface area of 30 hectares plus seepage at a rate of 10 litres per second to be 400 000 cubic metres for the season.
3. The 3.37 million cubic metres of irrigation demand has been based on an irrigated area of 690 hectares, a maximum irrigation rate of 320 litres per second and a irrigation rate of 0.476 litres per second per hectare.
4. In this scenario the maximum service level depth of water at the dam at the start of the season (1 October) is 26.5 metres, this gives an estimated storage volume of 5.5 million cubic metres and an estimated surface area of 55 hectares. By the end of the season i.e. 31 April of the following year, the water depth at the dam will have receded to 14.0 metres, the storage volume to 1.71 million cubic metres and the surface area to 14 hectares.
5. This analysis is somewhat conservative since it disregards inflow to the dam during the irrigation season notwithstanding that the mean flow at the dam site is estimated at 161 l/s [evidence of D.Stewart]. On the other hand I have made certain assumptions relating to likely evaporation and seepage losses, so on balance, given these limitations I am of the opinion that the figures presented give a reasonable picture of what circumstances could prevail allowing that they have been based on a provisional surface area / head and storage volume / head relationships for the dam.

Robert Hall
24 September 2008