

CASE STUDY

Geosynthetic Clay Liner

Project: McArthurs Ridge Estate
Date: August 2003 and November 2005
Client: Central Otago Pinot Noir Estates
Location: Alexandra, Central Otago



ELCOSEAL

The McArthur Ridge development involved converting open farmland, near the historic town of Clyde, into 56 individual holdings ranging from 8 to 49 hectares each with an average of 5 hectares of Pinot Noir vines. The vines are operated as a single vineyard by a management company.

Central Otago is surrounded by mountains and has four distinct seasons with New Zealand's most extreme temperature range. Rainfall is never high, typically <300mm and in summer it can get often get close to 40°C while in winter it plunge to below -10°C. The greatest risk to the vines is a late frost in spring. The technique used against frosts is to spray the vines with water to allow the ice to insulate the emerging buds from freezing. This process requires large amounts of clean water to be available to be pumped in a short amount of time. This required the construction of two large reservoirs. These would become major features clearly visible to the residents living on each holding. The reservoirs would be kept full much of the time they could be drained quickly when needed. The original intention was to contain the water with a compacted clay liner, sourced on site which would then be rock lined to minimise erosion. During initial excavation it became clear that use of the local clay was uneconomic and had a unacceptable risk.

A decision was made to use **ELCOSEAL X2000**, a Geosynthetic Clay Liner (GCL). A collaborative process between the Designer, the Main Contractor and Maccaferri determined that **ELCOSEAL X2000** would allow the efficiency of steep slopes, 2.5H :1V and also allowed onsite materials to be needed to provide a suitable sub grade surface base and the 300mm minimum cover layer required over the **ELCOSEAL X2000**.

The high hydraulic head of some 12m and the porous sandy gravels can present a significant risk to the long term performance of liners. **ELCOSEAL X2000** is specifically designed with features that minimise risk of leakage under these conditions.



View of site and start of laying of ELCOSEAL X2000



Close Up View



Front View

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