Reference SC/C/96A

SOIL CONSERVATION AUTHORITY

REPORT ON THE LAKE MERRIMU (GOODMAN'S CREEK) CATCHMENT

Prepared for consideration by the
Land Utilization Advisory Council
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REPORT ON
LAKE MERRIMU (GOODMAN'S CREEK)
WATER SUPPLY CATCHMENT

INTRODUCTION

The Lake Merrimu Water Storage is at present under construction by the State Rivers and Water Supply Commission. The project is divided into three stages comprising, firstly a 15,000 acre feet capacity reservoir on the Coimadai Creek some four miles north of Bacchus Marsh and a diversion tunnel from Goodman's Creek; secondly, a diversion tunnel from the Lerderderg River to Goodman's Creek, and finally an enlargement of the reservoir to 60,000 acre feet.

The Coimadai Creek catchment was proclaimed on the 31st August 1965. Notice of Determination of Land Use appeared in the Government Gazette on the 2nd November 1966. As construction of the diversion tunnel from Goodman's Creek became part of "Stage One" of the Lake Merrimu project, investigation of the Goodman's Creek catchment was carried out for the purpose of being proclaimed a Water Supply Catchment under Section 22 of the *Soil Conservation and Land Utilization Act* and its presented here.

GENERAL DESCRIPTION OF THE CATCHMENT

(i) Site of Diversion Weir, Details of Tunnel I

The 30ft high rockfill diversion weir will be located in CA 47, parish of Coimadai, about 6 m north of Bacchus Marsh. From here the waters of Goodman's Creek will be taken east along a 5,500 ft long tunnel to Coimadai Creek to be discharged at a point east of CA 84 in the parish of Coimadai some 3 m upstream from the embankment of the Lake Merrimu Reservoir.

The invert level of the upstream tunnel portal is at RL 627, that of the downstream portal at RL 606.5, giving a slope of 1 in 267. The tunnel will be 6 ft wide and 9" high, partly concrete lined having at 3'4" water level, an estimated flow capacity of 200 cusec.

(ii) Catchment Area and Land Tenure

The Ballan and Daylesford 1 inch to 1 Mile Military maps cover the area. The catchment falls within the Parishes of Coimadai, Coornmill and Bullengarook in the Shire of Bacchus Marsh and Gisborne.

The south end of the catchment, at RL 600, at the site of the diversion weir is about 6 m north of Bacchus Marsh. The north boundary is formed by a ridge traversed by Carroll's Road, at RL 2000, about 7.5 m upstream from the weir. The east side adjoins the Coimadai Creek Catchment on the west is the Lerderderg River catchment, the divide between the two being traversed by the Bluegum Track.

The catchment is a relatively narrow area, being about two miles wide and seven and a half miles long. About 7450 acres are in the State Forest, the balance, some 2,200 acres is alienated land. Most of the freehold land lies between Goodman's Creek and the Bacchus Marsh-Gisborne Road.

(iii) Geology and Topography

The catchment is based on two main formations. Newer Basalt covers the area south-west of Mt Bullengarook running along the Bacchus Marsh-Gisborne Road in a long tongue on the uplifted block. The land then falls away very sharply to the west where the bedrock consists of Ordovician sandstones and slates. A deposit of Miocene sediments, limited in extent, is found in the top north-east corner of the catchment.

The topography is very steep with slopes up to 65%. The streams are deeply entrenched, the more important tributaries come down from the western ranges while a few very steep gullies enter from the east. The steep slopes combined with poor soils and stony areas make Goodman's Creek a potential "flash flow" stream.

(iv) Climate

At Bullengarook East the average rainfall is 29.3 inches. The lower, southern part of the catchment appears to be affected by the rain shadow effect following the foothills of the highlands. Thus, Toolern Vale has an average fall of 23.4 inches.

The northern part of the catchment evidently has a longer growing season with more reliable rainfall, but also greater extremes of temperature. While there is a definite winter maximum rainfall, heavy summer thunder storms occur and May often turns out as one of the wettest months of the year. The effect of aspect is very marked.

(v) Soils and Vegetation

The soils on the basalt area consist of reddish-brown clay loams with heavy greyish-yellow clay subsoil. The land on these soils is all cleared, developed for pastures with cattle and sheep being grazed.

The soils on the ordovician area are shallow, very poor yellow solodics. In many steep areas the soil is skeletal. The land on these soils east of the creek is all cleared and carries native pasture. West of the creek the forest is of low quality stringybarks, red box and iron bark. There is little timber in the southern half of the area above fire wood standard, though there is some improvement in the stands of the northern section, with better stands of Messmate, Candlebark and Grey gum. Over most of the forested parts trees are accompanied by very sparse undergrowth, tussock grass and grass-tree. Growth on the ridge is extremely stunted.

(vi) Erosion

The soils on the basalt area are the most stable in the catchment. Because of the steepness of the slopes runoff for most part of the year is rapid and scours are present in the drainage lines, also noticed were some slips.

Sheet erosion, gullying and tunnelling are widespread on the solodic soils. The worst example of gully and tunnel erosion was found on CA 64 in the parish of Coimadai. West of this allotment on a foothill block, also tunnelled even if not as severely as the freehold land, Forests Commission successfully established a pine plantation and in consequence further outpouring of clay from the tunnels has been noticeably reduced. Sheet erosion and gullying under the sparse ground cover of these forests is a continuing process, its speed governed by the seasonal climatic conditions.

Since with the exception of the three small block owners in the north-east corner of the catchment the bulk of the alienated land is held by absentee owners and landholders who also own land on the east side of the Bacchus Marsh-Gisborne Road and have their homes on that more productive portion of their farms, human activity in the area is very limited. This is favouring conditions for the rabbit population and is adding to the already considerable erosion hazard.

Two of the small-block holders in the north-east on CA 62A and 62B, parish of Bullengarook, run pigs and have induced thereby considerable sheet erosion.

(vii) Land Use Problems in Relation to Water Spply

The aim of the Proclamation and subsequent Land Use Determination is to ensure a reduction of the silt load and the control over the quality of the water.

To achieve these aims in the catchment a considerable amount of assistance would be necessary. Although one of the landowners by using a "dozer for contour ripping and chisel seeding demonstrated that but for the steepest areas, over 50% slopes, considerable improvement of the pastures may be brought about. By increasing water use and the area of uniform infiltration this work is dispersing the water energy responsible for tunnelling.

However, judging by the way the local landholders farm their more productive land, it is unlikely to expect much support to treat these hazardous areas. To improve on the existing conditions considerable effort and expenditure on the part of the Authority would be required.

A land use determination can provide the basis for such improvement and undoubtedly will give immediate protection and assurance against further catchment deterioration brought about by human influence.

Viewed in this light the immediate effects of a land-use determination on

Freehold Land are:-

(a) Control over further clearing. (Because of the high erosion hazard and extremely low carrying capacity there does not seem to be any justification for further removal of forest cover);
(b) Protection of drainage lines;
(c) Control over extractive industries;
(d) Control over piggeries;
(e) The establishment of co-operation between departmental extension officers and landholders.

On Reserved Forests and Crown Lands:-

(a) The application of Forests Commission Standing Instruction No. 101. "No further earthworks shall be undertaken in any urban water supply catchment proclaimed under the *Soil Conservation Act* until after approval by the Soil Conservation Authority of the proposed work referred to the Authority by the Commission."

(b) Control over extractive industries;

(c) The establishment of close co-operation between the various departmental officers concerned and the co-ordination of policies and activities of the Government departments and public authorities concerned.

CONCLUSION

In consideration of the above it is recommended that for the protection of the Goodman's Creek Catchment as defined on the attached SCA Plan No. 2056 action be taken under the *Soil Conservation and Land Utilization Act*, Part III, Division 1, Section 22 and 23.

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