

**A REPORT ON THE
MONUMENT CREEK CATCHMENT**

**A proposal for proclamation
prepared for consideration by the
Land Conservation Council**

by
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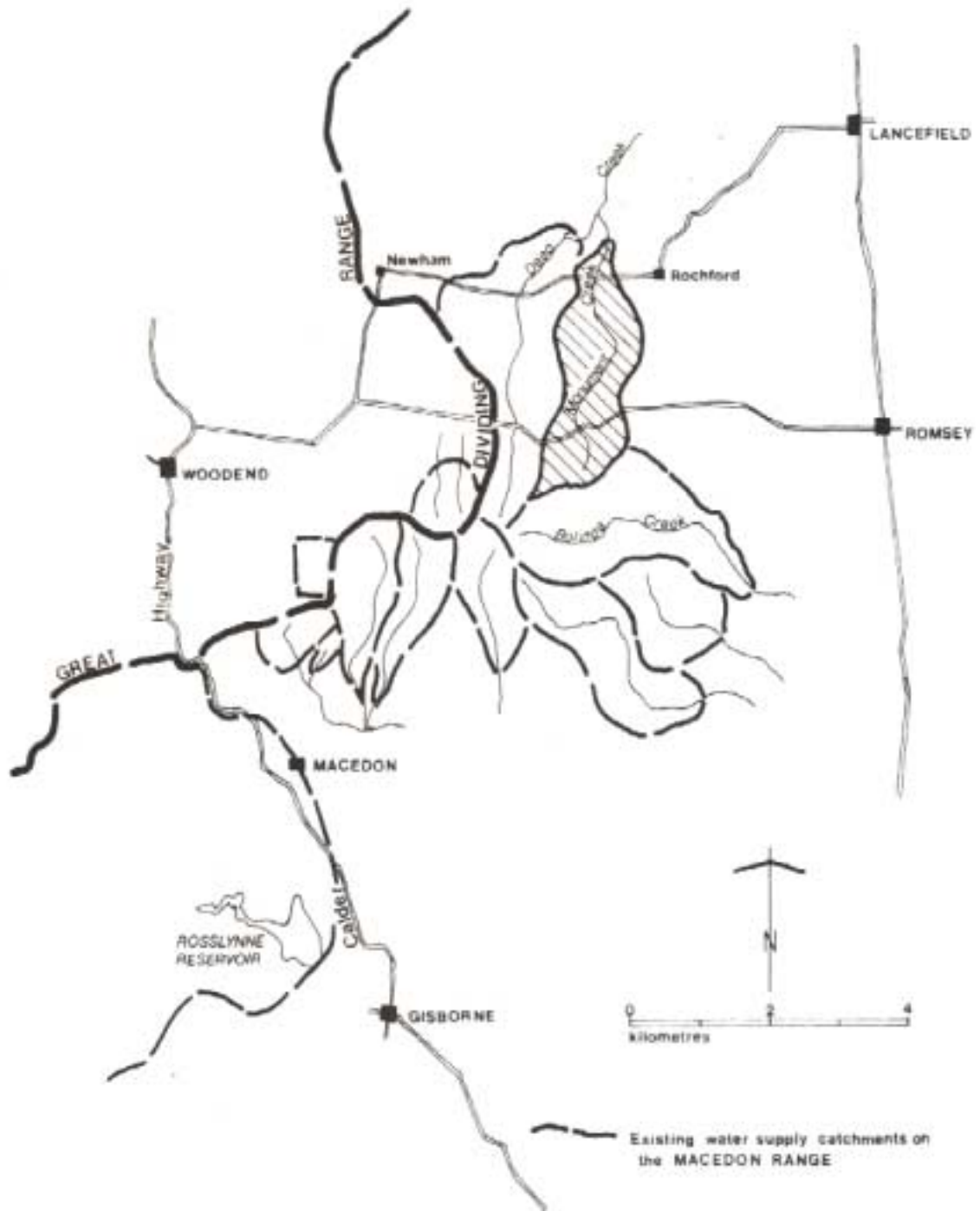
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Figure 1 - Locality Plan



1. INTRODUCTION

The Lancefield Waterworks Trust has recently constructed a low level diversion weir on Monument Creek to augment the water supply to the Lancefield township.

A request from the Trust for the proclamation of the catchment above the diversion point was forwarded to the Land Conservation Council in November 1977. This request was subsequently referred to the Soil Conservation Authority for investigation and report.

The Monument Creek catchment is located within the Land Conservation Council's Melbourne Study Area. In the Final Recommendations for the Area, Council maintains that all domestic Water Supply Catchments within the study area should be investigated by the Soil Conservation Authority and, where appropriate, recommended for proclamation by the Land Conservation Council, in order to ensure a uniform procedure for land use planning within these areas.

This report is based on a field investigation undertaken by the Soil Conservation Authority.

It is presented for consideration by the Land Conservation Council and recommends proclamation under Section 22 (1) of the *Soil Conservation and Land Utilization Act 1958* and Section 5 (1)(b) of the *Land Conservation Act 1970*.

2. SUPPLY SYSTEM

At present water for the Lancefield township is supplied from two storages:

- (i) the No. 1 Reservoir on Deep Creek, the capacity of which is 45 ML
- (ii) the No. 2 Reservoir which has a capacity of 68 ML and is supplied from the Deep Creek Reservoir by an old 150 mm diameter pipeline.

The water enters the reticulation system via a 300 mm diameter pipe from No. 2 storage.

In 1978 a diversion weir was constructed on Monument Creek and connected by a 225 mm diameter pipeline to the existing 150 mm diameter supply main. This enabled the supply to Lancefield to be augmented from Monument Creek when necessary. Water from this creek was first available for the 1978-79 summer.

The useable catchment yield from both sources is presently governed by available storage capacity.

The present population of Lancefield has been estimated as 600 persons; and if the present growth rate is sustained the population is anticipated to reach 4000 persons within 25 years.

The estimated present water usage for 600 persons is 110 ML annually with a maximum daily requirement of 0.81 ML. A population of 4000 would require 730 ML annually and a maximum daily requirement of 5.4 ML.

With careful operation of the two sources of supply, Deep Creek and Monument Creek and with restrictions imposed, the existing works could supply a population of 800 in Lancefield.

Operation of the supply system would be:

Step 1 Utilize flow in Monument Creek at the start of the summer until -

- (a) Deep Creek Reservoir overflows, or
- (b) there is minimum flow in Monument Creek (0.6 Ml per day) to preserve water rights down stream of the weir.

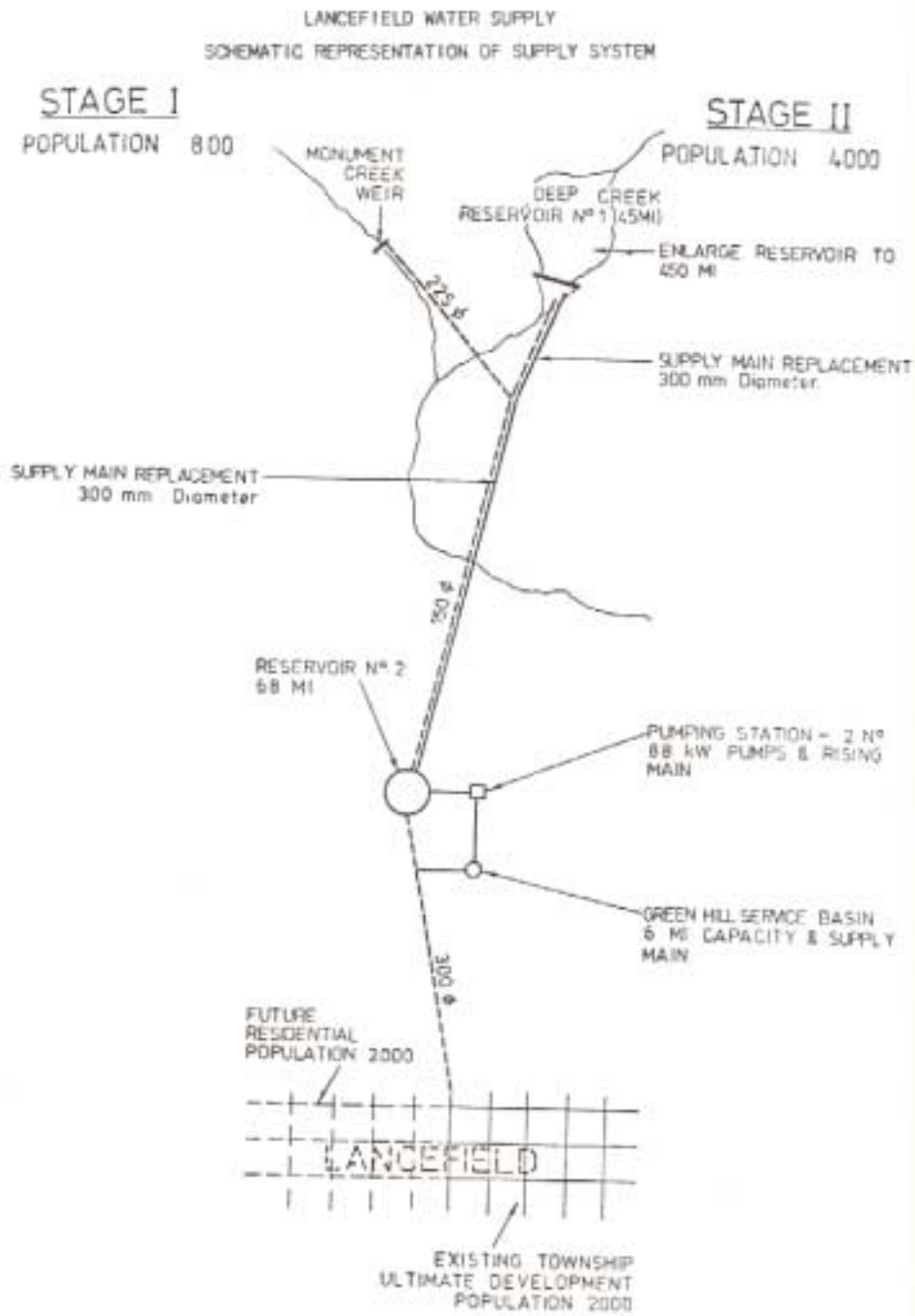
Step 2 Draw down Deep Creek Storage to low water level.

Step 3 Draw down No. 2 Reservoir to a reserve capacity of 23 ML.

The Trust has adopted proposals (see Fig. 2) for the enlargement of headworks and the provision of new works to supply a future population of 4000 persons in Lancefield by:

1. Replacing the existing 150 mm diameter supply main with a 300 mm diameter main.

Figure 2 - Lancefield Water Supply - Schematic presentation of supply system



SUPPLY SYSTEM: Existing _____, Proposed _____.
Adapted from diagram supplied by Lancefield Waterworks Trust.

FIG 2

2. The enlargement of the Deep Creek Reservoir from 45 ML to 450 ML.
3. The provision of a high level pumping station and 6 ML service basin.

3. WATER RESOURCES

The major contribution to the water yield from Monument Creek arises from surface runoff. Springs located near the southern catchment boundary provide a basic perennial source of extremely high quality to the creek. Some springs are located lower down in the catchment, however, the contribution from these is minimal and less reliable.

Neither the yield nor the quality of water from Monument Creek, has in the past been monitored.

Due to the fact that the major input to yield comes from surface runoff, fluctuations in quality and quantity would reflect the current state of the catchment.

Local, experience indicates that summer flow in Monument Creek continues after Deep Creek has ceased to flow, and that the water quality is superior to that of Deep Creek.

Due to the nature of the catchment and the activities that occur within its boundaries, there is an ever present threat of siltation and turbidity of streams and biological pollution occurring.

At present, water supplied by the Lancefield Waterworks Trust is untreated and unchlorinated.

4. PLANNING CONTROLS

The catchment is within the area covered by the "Statement of Planning Policy, No. 8 (Macedon Ranges and Surrounds)". This provides broad policies for the future planning and development of individual areas within the policy area.

The policy states that protection and utilization of the resources of the policy area for water supply, tourism, recreation and nature conservation shall be of primary concern and that, where appropriate, due account shall be given to the value of the area for forestry and agriculture.

The catchment area to the east of Monument Creek is within the Shire of Romsey and is currently zoned Rural A - General Farming Zone. Within this zone Council approval is required for subdivision of land and there is a 40 hectare minimum subdivision area.

Under the Shire's proposed Interim Development Order, which has been adopted but not yet approved, part of this Rural A zone has been rezoned to Conservation Zone (Fig.3). Within this zone Council approval is required for subdivision of land and most forms of development. The primary purpose of this zone is to protect domestic water supply catchments.

It would be anticipated that, once proclamation has occurred, the Conservation Zone would be extended to cover the whole of the Monument Creek Catchment.

The remainder of the catchment, to the west of Monument Creek is within the Shire of Newham and Woodend, and under the control of that Shire's Planning Scheme, approved in 1978.

The west bank of Monument Creek, between the offtake and the Woodend - Lancefield Road, is covered by the Watercourse Zone (Fig. 3). The provisions of this zone prohibit the erection of houses and further subdivision other than for restructuring purposes.

The remainder of the catchment is within the Rural B Zone and requires council approval for subdivision and the erection of a house. The minimum subdivision area is 40 ha. It is to be noted that zonings within the catchment are not consistent between the two Shires. The Romsey Shire's Conservation zone is primarily designed to protect water supply catchments. The Shire of Newham and Woodend has no equivalent zoning except for part of the immediate stream environs covered by the Watercourse Zone.

It would be desirable, if not essential that the zonings within the two Shires recognise the relative importance of the area as a Water Supply Catchment with complementary zonings.

Figure 3 - Planning Controls

MONUMENT CREEK WATER SUPPLY CATCHMENT



Lancefield Water Works Trust

PLANNING ZONES

Shire of Romsey

-  General Farming
-  Conservation

Shire of Newham & Woodend

-  Watercourse
-  Rural B - General Farming

-  Catchment Boundary
-  Shire Boundary

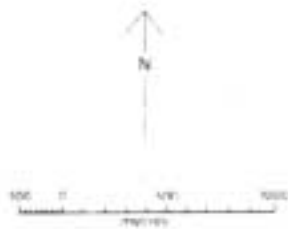


FIG 3
PLANNING CONTROLS

5. CATCHMENT DESCRIPTION

(a) *General*

Monument Creek is a northward flowing stream with its catchment located in the northern foothills of the Macedon Ranges. The township of Romsey is 6.5 kilometres to the east and the rural locality of Rochford is just to the east of the catchment boundary.

The catchment has an area of approximately 940 hectares and runs in a northerly direction. It is 6.5 kilometres long and 2 kilometres wide. The Romsey (Bolinda Creek) catchment is located adjacent to the southern catchment boundary and the Lancefield (Deep Creek) catchment is immediately to the west (Refer Fig. 1).

The elevation at the offtake is 515 m rising to 775 m at the south-eastern and south-western boundaries.

(b) *Geology and Physiography*

The geology of the catchment falls into three categories:

- Devonian Conglomerates and sandstones near the catchment boundary in the south-east.
- Quaternary trachyte (Basalt) to the west and south-west.
- Lower Palaeozoic sandstones and slates for the remainder of the catchment (with the exception of a minor Basalt ridge in the centre).

The topography ranges from hilly in the south to gentle, ridges and undulating plains to the north. At the head of the catchment, Monument Creek and its tributaries are well entrenched. On the lower areas the creek is located within a narrow alluvial flood plain.

(c) *Climate*

Rainfall records are available for three recording stations near the catchment (refer to Table 1).

Table 1. - Average Annual Rainfall

Recording Station	Location	Average Annual Rainfall (mm)
Romsey	6 km east	734
Lancefield	8 km north-east	733
Kyneton	18 km north-west	751

Within the catchment the average annual rainfall is estimated to increase from 750 mm in the north to above 800 mm in the south. The wettest months of the year are June to September with approximately 41% of annual rainfall occurring during these months. January through to March are the driest months and record approximately 18% of the annual rainfall.

The average daily maximum temperature is estimated to be about 25⁰C in January and February. In July, the estimated average daily maximum temperature is about 8⁰C. The average daily mean temperature drops to an estimated 5⁰ C in July, at which time the average daily minimum temperature is estimated to be 1⁰C.

The normal growing season in the catchment would be from early March to mid-December. However growth will be restricted by low temperature for 2-3 months of the year.

The nearest meteorological station that records the occurrence of frosts is Kyneton which has an average of 114 frost free days and frosts could be expected between mid-March to mid-November. The frost free period in the catchment would be expected to be somewhat shorter.

(d) *Soils and Vegetation*

Red gradational soils are present on the Devonian conglomerates in the south-east of the catchment. These soils are well structured, have moderate permeability and have a moderate sheet erosion hazard. The surface texture of these soils is generally a loam through to a fine sandy clay loam. The soils on the lower slopes are deep and sown to improved pasture while the shallower soils on the crests carry a low open forest of Eucalypt species.

On the upper slopes of the Quaternary basalt, strongly structured red gradational soils of high permeability are found. The surface texture ranges from a loam to clay loam and these soils have a low erosion hazard. These deep, friable soils are used for grazing and potato cropping.

The soils that occur on the lower basalt plains are brown gradational soils of moderate structure and moderate permeability. The surface texture is generally a clay loam and a low erosion hazard prevails. These soils are not as deep as those on the upper slopes and are used predominantly for grazing and some fodder cropping.

Soils derived from the Ordovician sedimentary parent material are predominantly red duplex soils on the upper slopes in the east of the catchment and mainly yellow duplex soils lower in the catchment to the north. The surface soils are generally poorly structured sandy loam to clay loam over a more strongly structured clay subsoil. These soils have a moderate permeability and a moderate sheet and gully erosion hazard.

In the east on the red duplex soils there is an area of approximately 140 hectares which has remained forested. It comprises an open forest; mainly of Manna gum (*Eucalyptus viminalis*), Messmate (*E. obliqua*) and Broadleaf Peppermint (*E. dives*) and is of little commercial value. The lower strata is made up of various shrubs, grasses and herbs. The remainder of the soils based on Ordovician material are used for grazing.

The soils found on the flood plain to Monument Creek are alluvial and reflect the nature of the parent materials that occur within the catchment.

The pastures found within the catchment are generally improved with such species as perennial ryegrass, cocksfoot and various clovers and subclovers.

6. LAND TENURE AND LAND USE

Apart from a narrow strip of public land frontage adjacent to Monument Creek and road reserves, all other land in the catchment is in freehold ownership.

The range of allotment sizes throughout the catchment closely reflects the nature of the soil. Towards the south, on the better structured, basalt soils, the allotments are significantly smaller than those located to the north on soils derived from Palaeozoic parent materials.

Cattle grazing is the major land use in the catchment, while sheep enterprises take up a minor portion of land use. There has been a trend of horse agistment replacing sheep and cattle, as the population drift from Melbourne to the rural areas progresses.

A small amount of fodder cropping and oats cropping is associated with the grazing enterprises.

On the red and brown gradational soils derived from basalt, intensive cropping for potatoes is practiced on a significant scale.

Those areas that remain timbered have little or no economic value for forestry purposes, and may in the future be cleared, or used as large residential allotments.

7. HAZARDS TO THE WATER SUPPLY

In the south-western area of the catchment, where the soils are derived from basalt, the erosion hazard is generally low; the remaining areas, with soils derived from Palaeozoic parent materials, generally have a moderate erosion hazard.

Biological pollution and high levels of turbidity are likely to result from the accessibility of both humans and animals to the water supply. A further threat exists from the location of a domestic dwelling within metres of the creek, a few hundred metres upstream from the offtake.

The intensive cropping enterprises could be a source of turbid runoff, pesticide pollution, and increased nutrient levels due to leaching of fertilizers.

Unsealed roads throughout the catchment are a source of siltation to the water supply. This is especially so for Monument Creek Road which for most of its length runs adjacent to the creek.

Any additional clearing in the catchment may give rise to increased overland flows, erosion and turbidity.

The threat from potential hobby farm development and intensive animal industries appears to be covered by the respective Shires' planning controls.

Figure 4 - Public Land (LCC Recommendations)



8. LAND CONSERVATION COUNCIL RECOMMENDATIONS

The final recommendations for the Melbourne Study Area state "that all domestic water supply catchments within the study area should be investigated by the Soil Conservation Authority and, where appropriate, recommended for proclamation by the Land Conservation Council, in order to ensure a uniform procedure for land use planning within these areas".

The report further states that "where a number of other products are required from a catchment supplying water used for domestic, industrial or irrigation purposes, the catchment should be proclaimed, under Section 22 (1) of the *Soil Conservation and Land Utilization Act* 1958 and Section 5 (1)(b) of the *Land Conservation Act* 1970".

The only specific recommendation for the catchment refers to public land adjacent to Monument Creek shown in Fig. 4. The present status of the land is road reserve and a road is constructed in this section. In the recommendations the area is defined as a "public land water frontage reserve" and that it be used to:

- (i) protect adjoining land from erosion by the maintenance of an adequate vegetation cover;
- (ii) maintain the local character and quality of the landscape;
- (iii) conserve native flora and fauna;
- (iv) provide opportunities for low-intensity recreation;
- (v) allow access to water and for grazing of stock by adjoining landholders under licence where appropriate and that public land water-frontages be permanently reserved under section 14 of the *Land Act* 1958.

9. SUMMARY

Monument Creek is a northward flowing stream draining the northern foothills of the Macedon Range. Lancefield Waterworks Trust have constructed headworks to, enable the water supply to be augmented from this source when necessary.

Almost all land is in freehold tenure, and apart from a small area of forest cover on poorer soils, the land is highly developed for agriculture, predominantly stock grazing and some cropping.

Siltation and turbidity of streams and also biological pollution are all threats to the water supply.

In the adjacent Lancefield (Deep Creek) catchment, which has catchment characteristics very similar to Monument Creek, a biological pollution emergency arose in early 1973. The water in the No. 1 Reservoir had an extremely high *E. coli* reading and could not be used for human consumption. This type of deterioration could easily occur within the Monument Creek catchment due to the accessibility of the water supply to humans and animals.

Present water management practices are not sufficient to overcome the threats of deterioration of the water supply. Control measures are required to reduce these threats and these may need to be implemented via the statutory planning process.

10. RECOMMENDATIONS

1. That the Authority approve this report and forward it to the Land Conservation Council for consideration.
2. That the Land Conservation Council recommends to the Governor-in-Council that the Monument Creek Water Supply Catchment, as shown in Figure 5, be proclaimed under Section 5(1)(b) of the *Land Conservation Act* 1970 and Section 22(1) of the *Soil Conservation and Land Utilization Act* 1958.

Figure 5 - Catchment Plan No. S-757

