

A REPORT ON THE TANJIL RIVER CATCHMENT

**A PROPOSAL FOR PROCLAMATION PREPARED FOR
CONSIDERATION BY THE
LAND CONSERVATION COUNCIL**

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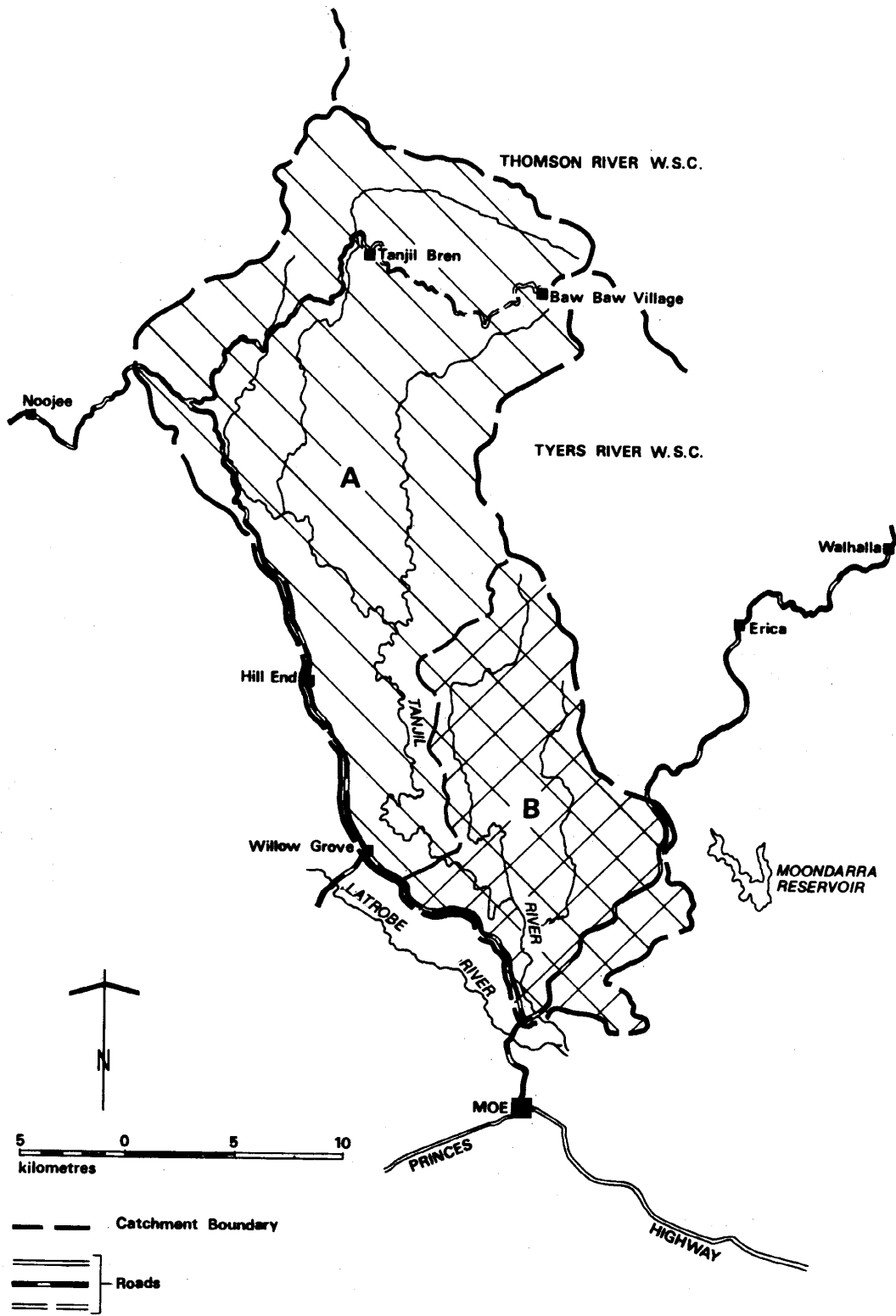
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Figure 1 - Locality Plan



FOREWORD

In April 1979 a draft report recommending proclamation of the catchment (area A of figure 1) to the proposed Tanjil River Reservoir was prepared.

Towards the final stages of the investigations preceding the report, it was discovered that proposals for the augmentation of Moe's water supply from the Tanjil River were at an advanced stage of consideration by the Moe Waterworks Trust. Reference to this was made in the report but investigation of the additional catchment, area B of figure 1, was not made because of uncertainty in several areas.

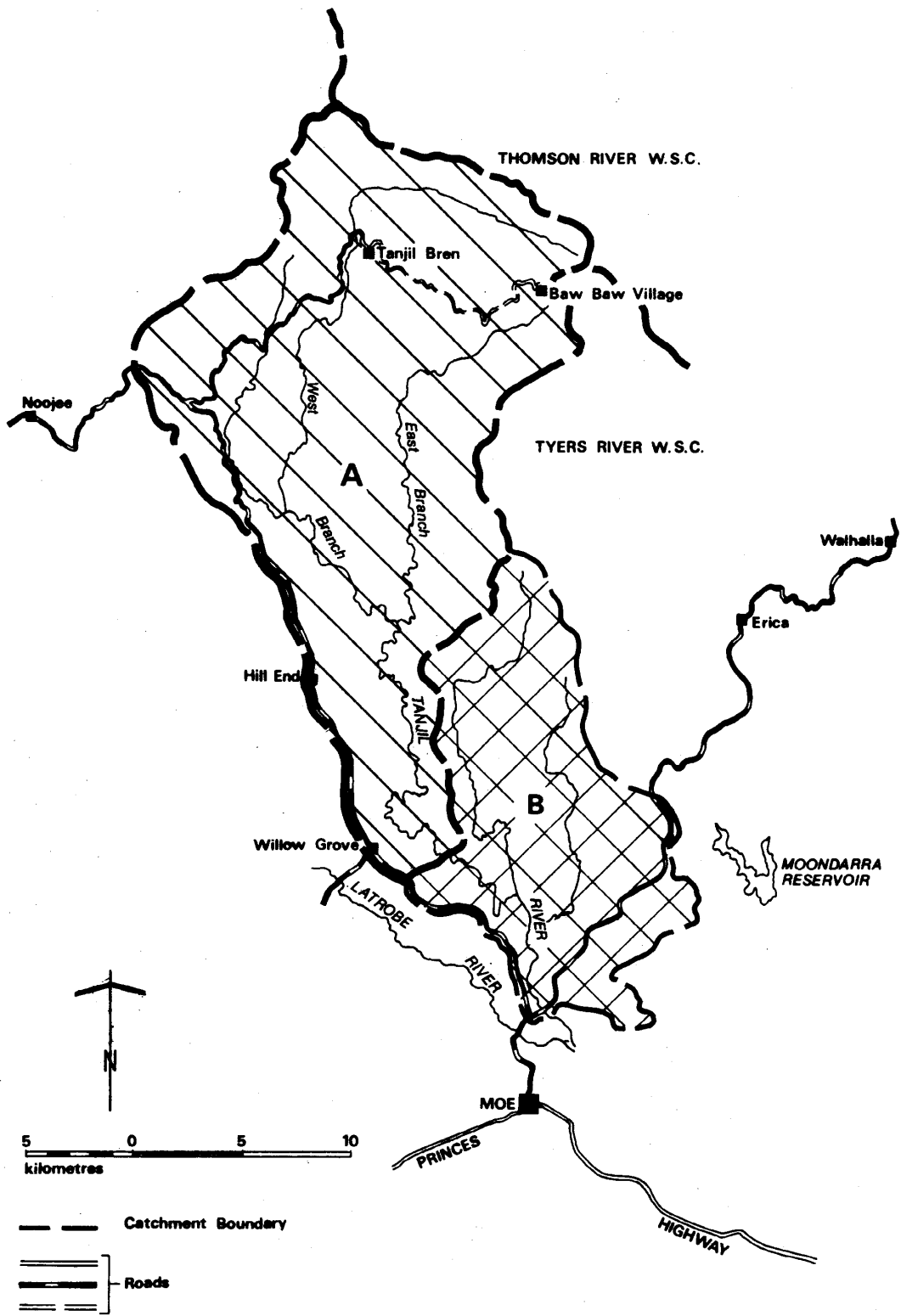
Before presentation to the Land Conservation Council the report was circulated to several Public and Government bodies for comment. In commenting on the report, both the State Rivers and Water Supply Commission and the Latrobe Valley Water and Sewerage Board were of the opinion that proclamation should extend to the proposed Moe offtake point.

These views were made known to the LCC when it met on May 3rd 1979 to consider the initial report. As a result of discussion at this meeting it was resolved to proceed with the investigations and reporting of the additional catchment area to the Moe offtake. Council would then consider a recommendation for proclamation of the Tanjil Catchment.

The supplementary report, included in this present report, is an account of these additional investigations. Duplication of information has not been made where aspects of a general nature applicable to areas both A and B occur. These are noted in the text.

INITIAL REPORT

Figure 2 - Locality Plan



INTRODUCTION

In February 1979, the State Government accepted the recommendations of all Party Parliamentary Public Works Committee for the construction of a dam on the Tanjil River in Gippsland.

The dam is to be located at T4 site, downstream from the Blue Rock site, and near Willow Grove (refer figure 2). It is due for completion by 1983 when cooling water will be needed for the Loy Yang Power Station. Storage capacity will be 200,000 ML.

Water from the storage would also be available for industrial and urban development and the expansion of authorised private irrigation within the Latrobe Valley.

The Land Conservation Council, in its Final Recommendations for the Melbourne Study area, has recommended that where "other products are required from a water supply catchment, the catchment should be proclaimed under Section 22(1) of the *Soil Conservation and Land Utilization Act 1970*". The Tanjil River Catchment was not specifically mentioned in these recommendations because the location of the reservoir was not finalised before the recommendations were published.

A request for proclamation of the catchment, (area A figure 2) arose from discussions held between the Soil Conservation Authority, State Rivers and Water Supply Commission and State Electricity Commission in 1978, when protection of the storage area was being considered. The State Rivers & Water Supply Commission will be constructing the authority.

In the preparation of this report, consideration has also been given to the additional catchment area involved in the proposed relocation of the Moe water supply offtake to a point on the Tanjil River some 9 km downstream from the intended damsite.

The additional area is half as much again as that to the damsite, and before a decision is made in regard to proclamation it is felt that further consideration should be given to factor of:

- * Dairying and cropping on the river flats between the damsite and the offtake
- * The present level of water treatment for Moe's domestic supply
- * The possibility of obtaining supply direct from the dam.

Following from the above, this report therefore presents information about land in the catchment of the Tanjil River and recommends that the catchment of the Tanjil River above the new reservoir be proclaimed.

WATER RESOURCE

Water Yield

The average annual discharge of the Tanjil River at Tanjil South is 150,00 ML.

Average annual runoff in the catchment increases from about 125 mm in the south to more than 850 mm on the Baw Baw Plateau in the north. Discharge records indicate that the area is amongst the most efficient within the Latrobe catchment in the production of surface water per unit area of catchment, and amongst the most reliable in Victoria in terms of base flow characteristics.

Water Quality

Regular analyses¹ of water samples, obtained from the river in the vicinity of the damsite, have been carried out since 1966. The physico-chemical and biological parameters measured included turbidity, suspended solids, electrical conductivity, pH, heavy metals, nutrients, BOD and *E. coli*. Water quality in the Tanjil River is reported to be quite good.

¹ Monthly sampling and analysis carried out by the Latrobe Valley Water and Sewerage Board

Supply Systems

Provision for obtaining urban supplies directly from the storage has been included in the design. However until such time as the advantages of direct supply become economically feasible, local authorities, along with the other downstream users, will obtain their allocations from releases to the river.

The proposed Tanjil River storage will have a capacity of 200,000 ML and will increase the regulated output from the Latrobe River System by 225,000 ML annually. Fifty per cent of the output of the dam will be reserved to meet the increasing requirements of the State Electricity Commission of Victoria and the remainder will be available for domestic, irrigation and industrial purposes in the Latrobe Valley.

THE CATCHMENT

General

The Tanjil River is one of the main tributaries of the Latrobe River entering its middle reaches near Moe.

The damsite on the Tanjil River is four km east of Willow Grove, eleven km north of Moe and ten km upstream of its confluence with the Latrobe River.

The approximate water surface at Full Supply Level will be 870 hectares. The catchment has an area of some 362 km².

From an elevation of 70 m (asl) at the dam site river levels, the catchment extends to the north, rising to an elevation of 1,500 m (asl) on the Baw Baw Plateau, where common boundaries with the water supply catchment of the Thomson River and Tyers River are located.

Baw Baw Alpine Village and the township of Tanjil Bren are in the headwaters of the catchment. Other small towns present are Willow Grove, Icy Creek, Vesper, Fumina, Fumina South and Hill End. These are located chiefly on the western perimeter of the catchment.

About 20% of the catchment is in the Shire of Buln Buln with the remainder in the Shire of Narracan. The catchment includes the Parishes of Fumina and Fumina North and parts of Tanjil, Neerim East, Toorong and Telbit West.

The catchment is within the Melbourne Study Area of the Land Conservation Council. Final recommendations for this Study Area were published in 1977.

Physiography and Geology

The Tanjil River Catchment is a small part of the extensive mountainous region in eastern Victoria. It consists of the dissected remnants of two plateaux and the erosional slopes below each of them. Baw Baw Plateau, the older and higher of the two and its slopes have been formed on granodiorite. The lower plateau and its slopes have been formed on a series of sedimentary rocks. Minor parts of the lower catchment are capped by basalt and unconsolidated sediments.

The Baw Baw Plateau is one of a number of uplifted erosional surfaces called high plains situated in the eastern highlands of Victoria that are considered to be the remnants of an extensive Mesozoic land surface.

The intrusive mass consists of granodiorite, and is surrounded by metamorphic rocks.

The massif is moderately dissected and has a rolling to hilly topography with flat bottomed valleys between the hills of 60-90 m height. Joint planes have caused the pronounced rectangular-stepped pattern of the drainage lines and shallow valleys. There is an abundance of tors in outcrops and wide peaty flats and swamps along streams. The deeply dissected rugged ranges of the Baw Baw Plateau on the metamorphics consist of a series of major spurs aligned in a general north-south direction, with an irregular network of inter-fingering secondary spurs.

The lower plateau of Siluro Devonian age sediments occupying the central and southern catchment, is preserved only as narrow ridge tops below which there are comparatively short erosional slopes forming steep sided valleys. The mature dissection has produced a dense dendritic drainage pattern within the sedimentary material.

Basalt flows in the Tertiary Period filled the ancestral Thomson, Tanjil and Latrobe rivers causing these rivers to abandon their former courses to create twin laterals. This resulted in the modern Thomson and Aberfeldy in the Thomson system and the Tyers, Latrobe and Tanjil in the Latrobe system.

Within the catchment the basalt forms areas of broad and moderately dissected rolling plains, capping the sediments on the western perimeter.

In the southern area of the catchment there are deposits of Late Tertiary unconsolidated sediments of sands and gravels capping the ridges and forming the present land surface. Broad gently undulating ridges with short slopes with steeper slopes across the ridges are present.

Occasional pockets of narrow flats consisting of alluvium occur along the main valley.

In a belt extending east of Fumina and Fumina South, and from Hill End to Willow Grove, gold bearing reefs and alluvial deposits are present and have been worked extensively.

Soils

On the Baw Baw Plateau, the brown gradational soils are characterised by a high organic colloid content, high permeability and high water holding properties. The soils have a sandy loam surface texture and vary in depth from 2 m to 0.7 m depending on aspect, site exposure and position on the slope. The maintenance of vegetation which provide a source of organic matter is critical to the stability of these and the peat soils on the plateau which are susceptible to erosion by both wind and water.

The brown and red gradational soils of the long mountain slopes of the massif and surrounding metamorphic based rock area are deep and have a loam surface horizon. The water holding capacity and permeability of the upper horizons are greatly influenced by organic content. The lower horizons although poorly structured have an open friable nature with large proportions of air space and large volumes available for water storage. Sheet erosion which can occur when heavy rain falls on an unprotected catchment after wildfires is the greatest potential hazard to these soils.

The steep foothills of the lower plateau have brown gradational soils which are highly acidic, are generally poorly structured, but friable in the upper horizons. Their water holding capacity is lower than soils described above and their surface textures together with depth of profile will vary between shallow soils with gravelly loam surfaces on exposed aspects to deep soils with loam surfaces in sheltered aspects. The potential hazard for sheet erosion is high amongst these soils because of steep slopes and erodible soils.

On the basalt capping, a finely structured deep red gradational soil has formed. The clay loam surface and red clay subsoil are well structured throughout showing good stability when wet. Under a cropping regime these soils are moderately susceptible to rilling and sheet erosion.

Within the environs of the damsite a small area of duplex soils is present. These show an abrupt change from either sand or sandy loam in the upper 250 - 400 mm to a predominantly clay texture below, often with a cemented layer at the point of change. Permeability in the subsoil is poor and seasonal waterlogging of these soils is common. Soils are susceptible to sheet erosion, but this is generally low except where steeper slopes and bared surfaces are present.

Vegetation

Based on the LUC classification, several structural forms of vegetation occur within the catchment. These are summarised below.

The plateau area above 1 200 m supports a sub-alpine complex of white sallee woodland, heath, herbfield, grassland and sedgefield.

Between 1200 m and 370 m ash forest predominate. A transition area around 950 m of Shining Gum is roughly the boundary between the upper area of Alpine Ash and the lower area of Mountain Ash species. The more sheltered gullies in the ash forests contain closed forest of Myrtle Beech with some Blackwood and Sassafras. Most of the area supports regrowth from the fires of 1939 and where repeated wild fire have occurred as near Tanjil Bren, closed forests of Silver Wattle and Mountain Hickory Wattle have developed over large areas.

At lower elevations, forests of mixed species become more common, although they may occur at higher elevations on drier sites, such as ridges and westerly aspects. The main species in these forests range between messmate

stringybark, narrow leaf peppermint, silver top and red stringybark depending on elevation and site conditions. For example at the lower elevations narrow leaf peppermint will occur in association with manna gum in the main drainage lines.

Small areas of heathy woodland are found on infertile soils in the lower catchment with stunted broad-leaf peppermint and yertchuk being the chief eucalypts. Near the proposed reservoir site the drainage lines support dense thickets of scented paperbark, pouched coral-fern pink swamp heath, woolly tea-tree and red fruit saw-sedge.

Climate

The average annual precipitation is estimated to exceed 1 800 mm on the Baw Baw Plateau and decreases with elevation to about 1 000 mm in the Latrobe Valley. The average annual rainfall at various recording stations in the catchment are as follows:

Tanjil Bren is 1 757mm; Vesper 1 385 mm; Fumina North 1 170mm; Fumina South 1 146 mm; Hill End 998 mm and Willow Grove 961 mm. Maximum monthly precipitation occurs in May and October.

Regular snowfalls can be expected above 950 m elevation from June to October, and on the Baw Baw Plateau persistent snow may lie for most of this time.

The highest temperatures are generally recorded in February and the lowest in July. The mean monthly temperatures at Baw Baw range from 13°C to 0°C; at Tanjil Bren 14°C to 5°C and at Warragul 19°C to 9°C.

Highland valleys may experience more than 100 frosts per year, averaging 1 or 2 per month during summer and more than 18 per month during the winter.

The estimated growing seasons derived from effective rainfall probability and mean temperatures show that Baw Baw and Tanjil Bren, there is a period of no growth with times of restricted growth becoming less towards lower altitudes.

LAND TENURE AND USE

Public Land

About 90% of the catchment is public land, predominantly Reserved Forest and unreserved Crown Land, with the Baw Baw National Park occupying the headwaters region generally above 1 220 m elevation. Prior to creation of the Park in late April 1979, it formed part of the Baw Baw Alpine Reserve. Baw Baw village is located within the National Park.

A public park and recreation reserve of 147.2 ha about the township of Old Tanjil is a popular area for camping and picnicking. Portion will be inundated at full supply level of the storage.

Forestry has been a major use of public land within the catchment over the past 40 years, the principal activity being the harvesting of mixed species stands together with small areas of highly productive ash stands. Many of these stands occur on the steeper slopes of the northern and eastern sections where clear felling techniques are used.

Apart from grazing on some unused road reserve adjacent to freehold land, there are no current grazing leases within the catchment on public land.

The Tanjil River catchment is situated on the Land Conservation Council's Melbourne Study Area for which final recommendations have been published. These apply to the catchment as shown in Figure 4 Area A.

The recommendations make provision for most of the public land to be used for hardwood timber production - with the associated uses of water production, recreation and conservation of native plants and animals. Portion of the Baw Baw National Park is located at the top of the catchment, and an education area is recommended for land immediately north of Willow Grove. The reservoir will directly affect the education area as the tail waters will bisect the area and portion will be inundated.

To date the government has approved the recommendations providing for the Baw Baw National Park A1, the uncommitted land U2, and the Tanjil Tyers forest E15. In the case of the Baw Baw National Park implementation procedures have taken place.

Freehold Land

Land surrounding the reservoir and along the south western perimeter of the catchment is freehold. Main uses of this land are forestry and grazing, with small areas in potato production. Beef and dairy herds are grazed on improved pastures in the area around and north of Willow Grove, along the broad ridge of the Tanjil-Latrobe Divide, along the Tanjil Valley south of Old Tanjil and on the narrow river flats. Small scale cropping operations are carried out on the basalt soils. Not all the freehold land has been developed but gradual clearing of the undulating land is occurring. However, regrowth is evident on much of the land cleared for agriculture.

Parts of the seventeen properties will be flooded by the storage. Grazing land occupies up to 36% of the total area inundated with the remainder being reserved forest. The State Rivers & Water Supply Commission are proposing to purchase land adjacent to the storage to include in a protective buffer surrounding the reservoir.

Adjacent to the western side of the proposed storage is the township of Willow Grove which contains about fifteen houses. A number of other small towns are present along the western perimeter of the catchment. Tanjil Bren in the headwaters has twenty-four residence licences and one lease to provide for a guest house, restaurant, milk bar, petrol station and ski hire.

Substantial use is made of the river and its catchment area for recreation purposes, mainly by anglers, hunters and bushwalkers. The Baw Baw plateau is a major recreation area and is used for snow sports, bushwalking and scientific study.

HAZARDS TO WATER SUPPLY

The condition of catchment land, apart from roading and some stream bank erosion, shows that land deterioration is not a major problem at present. The main source of sediment would be coming from roads, roadside erosion and stream bank erosion along the narrow floodplain.

Development of land within the catchment may extend into areas where the potential hazards are known to be high under some land uses.

In particular a high hazard threatens the sub-alpine areas of the Baw Baw Plateau where destruction of the vegetation can lead to severe wind and water erosion. As these areas generate extremely slowly, critical evaluation needs to accompany any proposed changes in land use.

Residential areas within the townships appear to be sufficiently dispersed to avoid the risks of contamination from ineffective waste water disposal systems, but this may not always be the case.

As the most intensive agricultural activities are limited to the stable well structured red soils on the catchment perimeter these also offer minimal hazards to the water supply at present. Erosion is confined to minor rilling and sheet erosion on the agricultural areas and alongside tracks.

The most significant land use in the remainder of the catchment involves forestry operations. In many areas especially on the lower plateau these activities, including roading, create high hazards because of steep slopes and erodible soils. There is no need therefore for management prescriptions to take into consideration the hazard appropriate to the particular area of operation.

Wildfire is a constant threat in the forested areas over the summer period and subsequent storms can cause significant sheet erosion, especially on the steep slopes of the massif.

Within the storage area and the direct catchment to it hazards created by the presence of houses, human contact, animal access and land disturbance can have a major effect upon turbidity levels and the level of pathogenic organisms, although detention offers some natural improvement in these parameters.

LAND CONSERVATION COUNCIL RECOMMENDATIONS FOR WATER PRODUCTION

The report of the final recommendations for the Melbourne Study Area state:

"Future water needs for domestic purposes and for stock and irrigation may require the construction of additional water storages. The Council notes the deliberations currently taking place on proposals for additional water storages in the Latrobe Basin at Willow Grove (Blue Rock)."

The report goes on to state that:

"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 recommends that:

"the present tenure and management of public land continue for the time being and that once a land use determination has been made, the following areas:

- (i) the storage areas
- (ii) diversion works
- (iii) associated facilities
- (iv) the buffer strips around diversion works and storages, as defined in the land use determination
- (v) any other allotments as specified below

be used for

- (a) water supply purposes
- (b) other activities permitted by the water supply authority after consultation with the Soil Conservation Authority and the Environment Protection Authority.

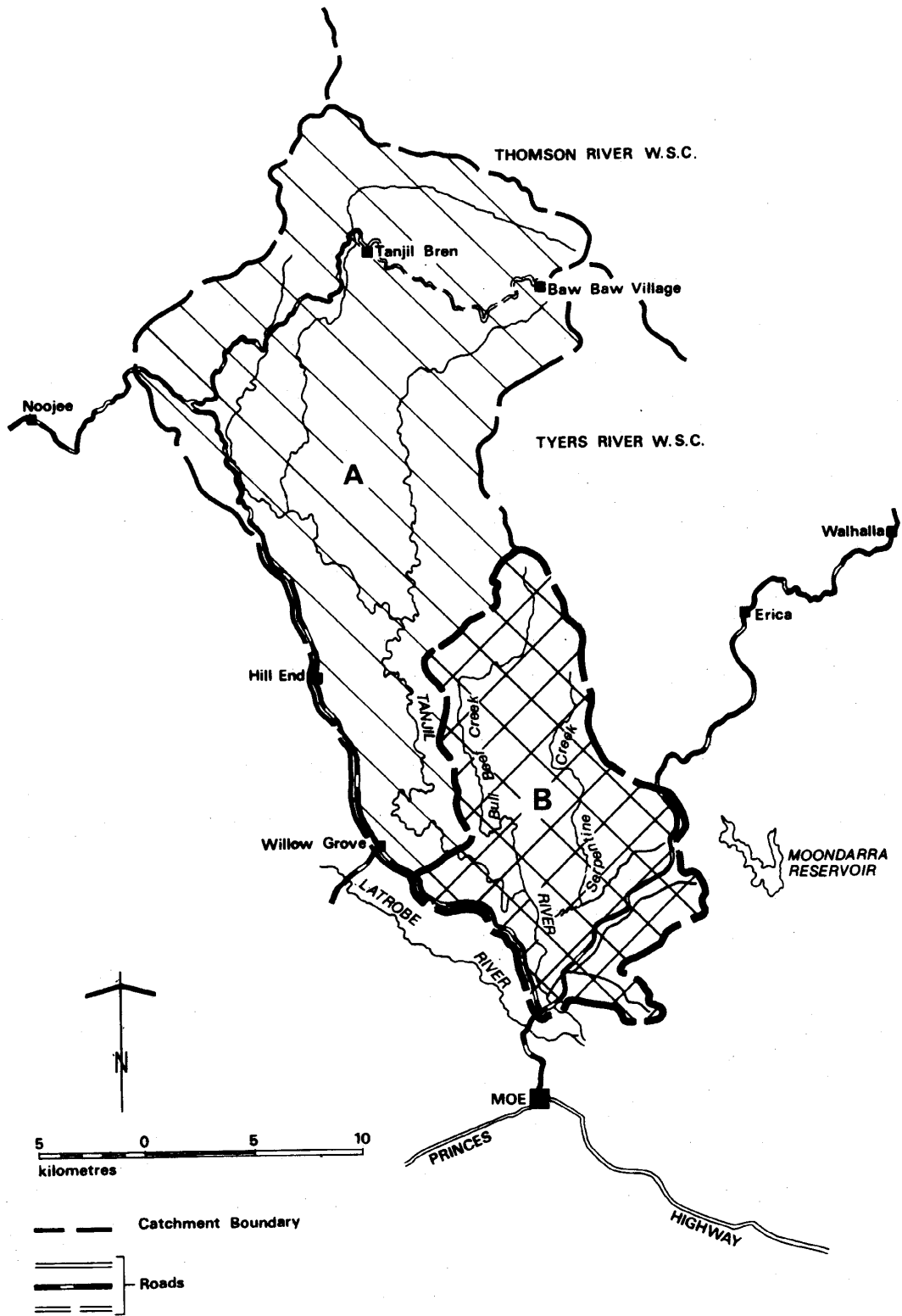
And that these areas be permanently reserved (now) under section 4 of the *Crown Land (Reserves) Act 1978*, for water supply purposes, and be managed by the water supply authority named.

Note:

- (i) The buffer should be wide enough to prevent direct pollution, to filter overland flow of water, and to control access. Its width will vary to suit differences in ground slope, soil type, vegetative cover, adjoining land use and type of facilities available for treating the water".

SUPPLEMENTARY REP ORT

Figure 3 - Locality Plan



INTRODUCTION

As referred to in the initial report, economic feasibility precludes the Moe Waterworks Trust from obtaining supply directly from the proposed Tanjil Reservoir; and the proposal for augmenting supply from the Tanjil river at a site in the vicinity of the Moe-Walhalla road crossing has been adopted.

The precise location of the site within the stretch of river under consideration is still uncertain. The catchment area has therefore been extended to include all land draining to the lowest point under consideration, (figure 3) although there are distinct advantages from a water quality viewpoint in developing upstream sites. This supplementary report discusses areas B of figure 3.

SUPPLY SYSTEM

The 90 day summer demand on the Trust's system in 1975 was estimated to be 760 ML with a peak daily demand of 17.3 ML. This is expected to increase to 1 140 ML and 24.5 ML respectively, with a design of 24,000 together with increased industrial and rural supplies.

The area serviced by the Trust comprises the City of Moe, including Newborough, and the township of Westbury. At present, supply is obtained from Narracan Creek - a catchment where both water quality and minimum flows have presented problems in the past. These problems are unlikely to improve, necessitating a supplementary source of supply which is to come from the Tanjil River.

The Tanjil River scheme provides for a low offtake weir and a pumping station at the point of diversion, delivering to a 525 mm rising main for a distance of 8.6 km to the existing treatment plant.

Following treatment, water gravitates to service reservoirs, of 22.7 ML capacity for reticulation to Moe, and 18.2 ML for reticulation to Newborough.

It is anticipated that the Narracan Creek catchment will continue to provide the bulk of the supply throughout the year with the Tanjil system operating as a supplementary source, dependant upon changing demand and conditions. When the Narracan Creek supply mains reach the end of their useful life, the Trust may wish to obtain its total supply from the Tanjil River.

WATER QUALITY AND WATER TREATMENT

The proposed Moe offtake has the disadvantage of being downstream from Willow Grove township and developed agricultural and plantation areas, thereby increasing the opportunity for pollution of the raw water. However, as the scheme will be operating predominantly in the summer months when releases from the storage will be greatest, some reduction in turbidity and bacterial concentration compared with the existing summer flow conditions might be expected.

Treatment consists of clarification by flocculation in settlement tanks, followed by chlorination. All raw water will be treated but the high colour characteristic of the Tanjil River is expected to persist. There is a future proposal to add filtration to the treatment plant, thereby providing additional improvements and safeguards to supply.

THE CATCHMENT

Almost the entire Tanjil River catchment drains to the site of the proposed Moe offtake. In addition to the catchment to the damsite, near Willow Grove, a further 147 km² of land is included in the catchment to the proposed offtake near the Moe-Walhalla Road; a point less than 2 km from the junction of the Tanjil and Latrobe Rivers and the tail waters of Yallourn storage dam.

Physiography, Geology and Topography

Within the catchment extension, two main physiographic units can be identified, namely: the Kinglake surface and the Moe flats.

Mature dissection of the Kinglake surface has resulted in steep-sided valleys with broad ridges of medium relief where Siluro/Devonian sediments predominate in the northern and central parts of the catchment extension.

As the catchment extends to the south, the gently undulating hills of the extensive Tertiary fluvial sediments in the east, and the rolling plain of the newer basalt in the west and the central Bull Beef Creek divide, grade to the Moe flats. The flats are composed principally of quaternary alluvium. These flats extend for some distance upstream of the junction with the Latrobe River, and along the eastern and northern tributaries of the Tanjil River resulting in a broad valley about these lower reaches.

Soils

Brown gradational soils derived from the Siluro/Devonian sediments occupy the steeper sections of the catchments in the central and northern regions. The finely structured deep red gradational soils occur on basalt in the west and in the vicinity of the Bull Beef Creek/Serpentine Creek divide. Descriptions of these soils are covered in the initial report.

In the remainder of the catchment, yellow duplex and yellow gradational soils occur on the sediments of Late Tertiary age.

On the quaternary alluvium flats, yellow-brown gradational soils form the major soil type.

Yellow gradational and yellow duplex soils occur on the slopes and crests respectively in the eastern catchment. Surface textures of these soils vary from friable grey sandy loam to coarse sandy loam; but all, overlie a red and white mottled sandy clay. Quartz is common throughout the deep profile and frequently a hard cemented layer is present, impeding internal drainage. Moderate sheet and gully erosion are the chief hazards with these soils.

The brown gradational soils on alluvium occur over a wide area across the broad valley downstream of the dam. Typically, they have a loam surface texture, although on the terraces gravel may be present throughout the uniformly textured profile. The central valley is subject to periodic flooding and seasonal wetness is a feature of the flats. Erosion hazard is low.

Vegetation

Using the LCC classification for description of vegetation, the following structural forms are present in the catchment.

Mixed stands of open forest III predominate throughout the steeper sections, with isolated pockets of open forest IV in gullies and open forest II on drier sites such as ridges and exposed aspects.

As the catchment extends to the south, open forest II predominates, but is replaced in part by heathy woodland as infertile soils on the eastern boundary are encountered.

Much of the lower section of the catchment now carries improved pasture, and on the eastern extremity softwood plantations extend into the Tanjil catchment from the adjacent Tyers catchment.

Climate

Annual average rainfall at Moe, some 5 km to the south of the catchment is 969 mm. Slightly higher falls could be expected in the north.

Low temperatures are likely to restrict growth from June to August, and in the lower catchment summer drought during February may also limit growth.

LAND USE AND LAND TENURE

Public Land

Public land accounts for 72% of the area in the catchment extension. Present status of the land is predominantly Reserved Forest. A belt of unreserved Crown land occurs intermittently with a public purposes reserve along the course of the Tanjil River. Similar reserves occur along Bull Beef Creek. Water frontage licences are common.

In the past hardwood production has been a major use of public land. A small section in the east on the common boundary with the Tyers catchment has been converted to softwoods.

The LCC has published final recommendations for the Melbourne Study Area which apply to the catchment as shown in Figure 4, area B.

The recommendations provide specifically for a portion of the public land (E15) to continue to be used for hardwood production, with the associated uses of water production, recreation and conservation of native plants and animals. In addition, that area recommended as uncommitted (U1), may also be used for timber production (amongst other uses) as long as such production does not reduce the long term ability of the land to meet future demands. For the balance of public land, a large section of catchment in the east falls within the area recommended for the Moondarra State Park (A10). Adjacent land is recommended as an education area: Boggy Creek (M15). Both the continuation of softwood production in the Moondarra plantation (F1) and the conversion of an additional area to softwood production in the Mt Carmel locality (F6) are recommended. The catchment contains the balance of the education area (recommendation M14) referred to in the initial report.

To date government approval has been given to the recommendations for the provisions of the uncommitted are (U1), the Tanjil-Tyers forest (E15), and the two softwood areas (F1 and F16).

Freehold Land

The major portion of freehold land takes in the gentler slopes of the Tertiary sediments, flats adjacent to the Tanjil River and its tributaries, and the undulating basalt hills. Clearing for agriculture has been extensive.

The flats in particular are intensively used for grazing beef and dairy herds. In most instances stock have direct access to streams. Also, within the Serpentine Creek sub-catchment, free-ranging pigs, from an intensive piggery in the catchment, have direct access to the streams. Downstream from the Moe-Walhalla Road crossing, abattoir holding paddocks drain to the Tanjil River above the lowest point proposed for diversion. These paddocks are heavily stocked, resulting in poor ground cover for much of the year.

The established nature of the land use in the lower section of the catchment, and the fact that much of the land is subject to flooding presents difficulties for catchment management and water harvesting.

Although unreserved Crown Land adjacent to the Tanjil and Bull Beef streams offers a means of controlling stock access to a considerable length of these streams from adjacent land, the practicability and economic feasibility of implementing such control would appear to be low. Flooding, the requirement for appropriate fencing, the provision of alternative stock watering, a change in the present conditions accompanying water frontage licences or their cancellation, the difficulty of adequately managing a narrow stretch of riparian land the provision of adequate supervision to ensure implementation of any conditions are some of the factors to be considered in evaluating the feasibility of changing from the existing situation.

HAZARDS TO THE WATER SUPPLY

Potential hazards similar to those described in the initial report apply also to the extension area.

In addition, however, deterioration in water quality can be expected to originate from the more intensive use of the area, compared with the catchment to the proposed reservoir.

Run-off from agricultural land which is intensively used for grazing purposes, contains a high nutrient load, a high bacteria content, and a high risk of pathogenic contamination. In particular, pigs present an increased risk of pathogenic contamination compared with most other animals.

A moderate hazard exists for sheet and gully erosion to occur in the east where infertile sandy soils predominate. Clearing and development for grazing is still being undertaken, and unless suitable protective measures are observed during the development phase, siltation and turbidity are constant threats to the water supply. Similar risks accompany softwood conversion operations.

The offtake for the Moe Supply may have to be located below the Moe-Walhalla Road, because this site is less prone to flooding, pumps are easier to locate above flood level and firm ground is available for pump foundations. However, the offtake is then downstream of the abattoir holding paddocks. This situation gives rise to increased risks of pollution virtually from a point source. Consideration should therefore be given to purchase of the land between the bridge and the offtake so that effective control over grazing is possible on this land and that it can be used as a buffer zone between the abattoir and the offtake.

SUMMARY AND RECOMMENDATIONS

SUMMARY

The catchment to the offtake proposed for Moe urban supply on the Tanjil River extends from the Baw Baw plateau in the north to the Moe-Walhalla Road crossing in the south, and area of 509 m². The proposed Tanjil River storage is located within the catchment near Willow Grove at the T4 site. Catchment area to this point is 362 km².

The environment ranges from sub-alpine on the Baw Baw plateau through the high rainfall zone amongst the rugged hills to the medium rainfall zone of the Latrobe Valley, an annual average precipitation spread of 1 800 mm to 1 000 mm from north to south.

Land is predominantly in public ownership (87%), with the balance freehold land, occupying a band adjacent to the western and southern boundaries, and taking in the slopes of Tanjil Valley downstream from Hill End.

The present status of public land is chiefly Reserved Forest, National Park and unreserved Crown Land. Timber production, recreation (snowfield and touring) and native conservation are the primary use.

Grazing (dairying and beef cattle), cropping and small township residential are the principal uses on freehold land.

Hazards to the water supply are expected to arise from catchment roading, management of freehold land, where stock have direct access to streams, and land disturbances associated with clearing and/or forestry operations.

The present condition of the catchment to the proposed Tanjil Reservoir is relatively stable. The balance of the catchment to the proposed Moe water supply offtake contains some moderately erodible soils which require careful management. This section of catchment is also likely to produce the main source of pollutants to the stream as a result of more intensive land management.

RECOMMENDATIONS

1. That the Authority approves this report and forwards it to the Land Conservation Council for consideration.
2. That the Land Conservation Council recommends to the Governor-in-Council that the Tanjil River Water Supply Catchment as shown on Plan No. S-753 (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 4 - Public/Land - LCC Recommendations

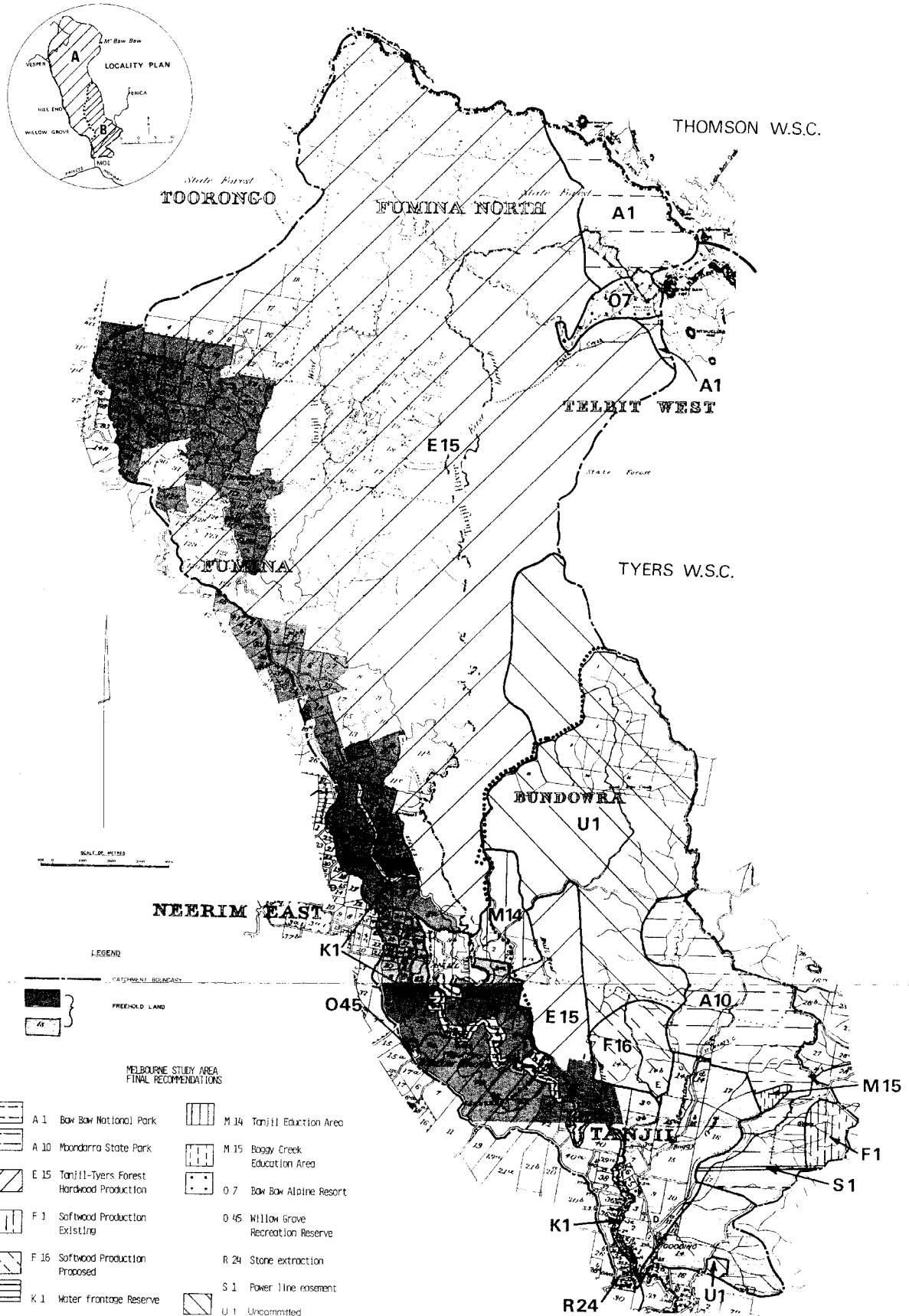


Figure 5 - Catchment Plan

