

ALBURY WATER

DROUGHT CONTINGENCY AND EMERGENCY RESPONSE PLAN

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ALBURY WATER DROUGHT CONTINGENCY AND EMERGENCY RESPONSE PLAN

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EXECUTIVE SUMMARY

Introduction:

The purpose of this Drought Contingency and Emergency Response Plan is to provide a strategic mechanism for managing water supply to the City of Albury and its customers in Hume Shire during drought periods or during an emergency interruption to supply.

System Description:

Albury is fortunate to have a sophisticated and secure water treatment, distribution and reticulation system.

The treatment capacity of the Water Filtration Plant is 140 megalitres per day which is approximately twice the capacity of the highest recorded peak day consumption to date.

With a storage capacity of 97.4 megalitres in the City's Service Reservoirs, there is considerable buffer supply capacity within the system to cater for most emergency disruptions to supply.

Framework and Goals of the Plan:

The strategy is framed about the following information and criteria:

- Past drought experience
- Past emergency supply situations
- Water consumption trends
- Legal and institutional requirements

Three specific goals are addressed in this Plan, namely:-

- Strategic objectives
- Planning objectives
- Operational objectives

Response Options:

Response options can be generally classified under two broad categories:-

- Demand management
- Supply management

Demand management in Albury focuses on community awareness and co-operation in maximising water conservation, backed up by a two-tier charging policy which effectively rewards consumers who use 300 kilolitres per year or less.

Targets for water consumption have been identified as:

- Annual Consumption 10,925 megalitres
- Peak Day Demand 75 megalitres/day
- Growth in Demand \leq 0.5% p.a.
(based on 2001/02 usage rates)

Demand management during drought conditions will focus on a 5 Stage system of water restrictions:-

- Stage 1 Restrictions Voluntary reductions only, enhanced by public awareness campaigns
- Stage 2 Restrictions (Low Level) Bans on sprinkler use between the hours of 7am and 9pm
- Stage 3 Restrictions (Moderate Level) A total ban on fixed sprinklers. Garden and lawn watering restricted to the hours of 9pm to midnight only, with provision for introduction of an odds and evens roster system
- Stage 4 (Severe Restrictions) A total ban on garden/lawn watering, car washing and standpipe use, and negotiated reductions in industrial and commercial use
- Stage 5 (Emergency Restrictions) Supply restricted to 60 litres per person per day

During emergencies, demand management would also rely on the above stages of restrictions.

The situations which would trigger an emergency response are:-

- Contamination of the water supply
- Substantial loss of filtration capacity
- Widespread power failure
- Major system failure
- Flow cessation in River Murray

There are three (3) identified Response Levels in the Plan, namely:

		<u>Response</u>
Level 1:	Local Area Interruption to Supply	Stage 3 Restrictions
Level 2:	Widespread Interruption to Supply	Stage 4 Restrictions

Level 3:	Extreme Emergency	Immediate Stage 4 Restrictions. Stage 5 Restrictions implemented if situation not resolvable within 5 days
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The Plan allows special consideration for fire fighting and for industrial/commercial use.

Media/Communication Strategy:

Quite apart from Council's annual water conservation campaign, any restrictions to be imposed will be communicated officially by a public notice in the Border Mail, backed up by a range of media announcements.

Under Emergency situations, a letter box drop will be conducted to every affected residence.

Penalties:

The maximum penalty to apply for a breach of imposed restrictions is \$2,200 and periods of water restrictions will be policed by Council's Ordinance Officers.

Monitoring and Revisions:

Close demand/supply monitoring is essential during drought or emergency situations. This plan (as amended) which is DATED NOVEMBER 2002, will be subject to annual review based on the results of the on-going monitoring procedures.

D L McGregor
**MANAGER ALBURY WATER
CITY OF ALBURY**

1. INTRODUCTION

1.1 General

The Preparation of a Drought Contingency and Emergency Response Plan for a water supply authority needs to be based on a thorough assessment of the regional and local factors which affect planning and management.

There are two primary components involved in securing an adequate water supply in times of drought and during emergency situations. These are:-

- a. the provision of an adequate supply system to satisfy current and future demands over a range of climatic conditions (including drought conditions) and emergency situations.
- b. the definitions of actions required when shortfalls in water available for supply occur and when supply is interrupted under emergency conditions.

The first component represents the long term planning actions which result in a satisfactory level of infrastructure development and the investment required to secure supply under a range of adverse conditions.

The second component relates to management actions which are required to be implemented to minimise the adverse impacts of a short fall in supply. These actions complement the long term planning process.

An acceptable Drought Contingency and Emergency Response Plan involves an appropriate combination of long term and short term management actions.

This document is a Drought Contingency and Emergency Response Plan for the City of Albury's water supply district, including those areas of Hume Shire (Wirlinga, Table Top, and Hume Villages) provided with bulk water supply from the City's system.

1.2 Issues in Drought Management and Response to Emergencies for Albury Water

Raw Water is supplied from the Murray River, with three (3) draw off points available, known as the Town Offtake, the Low Lift Offtake and the Hawkescote Offtake. (Refer Figure 1 for locations of offtakes).

As at September 2002, the City's entitlement is 12274 megalitres per year, which includes an allowance for Hume Shire (Wirlinga, Table Top and Hume Villages).

The summer of 1997/98 was extremely dry and Albury Water needed to closely monitor the performance of its water supply systems over that period. The City recorded its highest consumption on record during 1997/98, with 12153 megalitres used by the City and the Shire, (just 111 megalitres less than the entitlement of 12264 megalitres at that time). No water restrictions were imposed during this period.

A similar drought period occurred in 1982/83, when the City's consumption was 10234 megalitres. Water restrictions involving an odds and evens house number system of sprinkler use applied during the summer of 1982/83.

1.3 Emergency Response Issues

The issues that would trigger an emergency response and introduction of restricted supplies are:-

- contamination of supply, either at the source (Murray River) or within the City's supply system.
- concentrations of algae or suspended material in the raw water supply causing substantial loss of filtration capacity.
- widespread power failure affecting transmission of raw and/or filtered water.
- Major system failure, including failure of major distribution mains, service reservoir(s) or distribution pumping stations.

The response would largely depend on the magnitude and/or duration of any of the above emergencies and the ability of the system to supply water to consumers

2. SYSTEM DESCRIPTION

Water for Albury is pumped from the Murray River at three points. These are at the Town Offtake "Waterworks Road", at the Low Lift Offtake, about a kilometre upstream of the waterworks, and at Hawkscote, five kilometres upstream. These pumping stations were originally built in 1882, 1976 and 1992 respectively. The Town Offtake was rebuilt in 2001.

The water is piped to the filtration plant where it is treated, and then pumped into storage reservoirs around the city. The filtration plant was built in 1980, and augmented in 1992.

At the filtration plant, chemicals are added to the water to flocculate suspended particles. The chemicals used are alum (aluminium sulphate) and polyelectrolyte (non-ionic polymer). After mixing to ensure that the chemicals are spread throughout the water, a short period elapses to allow

the suspended particles to flocculate into clumps big enough to be filtered out.

The filter beds consist of layers of gravel and sand, topped with a layer of hard filter coal, which traps the flocculated particles. After filtering, chlorine is added to kill any bacteria, fluoride is added for healthy teeth, lime is added to remove the acidity caused by the alum and the water is stored in tanks nearby.

After a period of between 8 to 24 hours operation the filters become clogged and are cleaned by pumping clean water back through them to flush the filtered material to the sludge lagoons. The backwash water is allowed to settle in the sludge lagoons, with the clear water returned to the plant. The settled material is allowed to dry out and is disposed of by burial off site.

The filtration plant is computer controlled and is capable of treating up to 140 megalitres per day. The plant operators and the computers monitor the operation and the quality of the water to ensure that it is of a high standard. After filtration, the clean water is distributed around the city by the pumps in the pump station at the rear of the filtration plant. These pump to East Albury, North Albury, Lavington and Thurgoona (One Tree Hill) with other areas being served by smaller pump stations throughout town.

The capacity of the system is enough to supply the predicted growth of Albury until beyond the year 2020.

Locations of the raw water offtake points are shown in Figure 1. Figure 2 shows the layout of the Filtration Plant and Figure 3 shows the major components of the Distribution System.

Key features of the supply system are summarised below:-

Water Supply Services

- Raw Water Pumping Stations - 3 Number:-
 - * Waterworks Road P.S. (RWPS No. 1) Capacity 440l/s
 - * Low Lift P.S. (RWPS No. 2) Capacity 560l/s
 - * Hawkescote P.S. (RWPS No. 3) Capacity 880l/s

- Filtration Plant Capacity 140 Ml/day

- Storage Reservoirs 27 No.

- Storage Capacity 97.4 megalitres

- Water Mains 384.6 kilometres (varying in diameter from
100mm to 750mm)

- Distribution Pumping Stations 16 No.

- Entitlement 12274 megalitres
- Annual Consumption (2001/02) 10022 MI

(Note: recorded consumption for the last 20 years is detailed in Table 1)

- Population Supplied 46,000 approx.
- Customer Service Connections 18,326

(Albury Water also provides bulk water into Hume Shire, with supplies to Jindera, Table Top, Wirlinga and the Hume Villages)

- Peak Day Consumption

(1997)	76.5 MI
(1998)	71.6 MI
(1999)	74.2 MI
(2000)	66.9 MI
(2001)	69.0 MI

The rates and charges which apply to consumers are:- (at September 2002)

Water Rate: \$153 per assessment (\$102 for flats and units)

Sales: 12c per kl up to 300 kl/annum
45c per kl thereafter

3. FRAMEWORK AND GOALS FOR THE PLAN

3.1 Past Drought Experience

It should be noted that metering of supply to all consumers was introduced in Albury in 1987. Recording the bulk water supplied to the City and to Hume Shire commenced in 1982.

The two drought events in the period 1982-2002, occurred in 1982/83 and again in 1997/98.

Water restrictions were imposed in 1982/83, involving an odds and evens property number system of garden and lawn watering. No restrictions were applied in 1997/98 when the highest consumption on record was noted, 12153 megalitres (entitlement was 12264 MI).

The region is currently (2002/03) experiencing a severe drought period, which appears to be more severe than the drought of 1997/98. In response to this event, the City has resolved to introduce a moderate form of water restriction for the summer of 2002/03, namely:-

"When the temperature is predicted to reach 38°C or higher, hand held hoses only are to be used for garden watering between the hours of 7am and 9pm. Fixed sprinklers will only be permitted between 9pm and 7am."

This situation will be monitored and reviewed during the summer and Council has reserved the right to introduce more stringent water restrictions if conditions require it.

3.2 Past Emergency Supply Situations

There have been no recorded situations of emergency conditions of the type listed in Clause 1.3.

An algal infestation occurred in the 1982/83 period which restricted water filtration capacity, but this coincided with the drought of that year and the City had already imposed moderate restrictions.

The Filtration Plant and the Distribution System were able to cope adequately with peak demands during this period.

There have been recorded instances of local area supply restrictions as a result of pump failure, power failure or distribution main failure. The in-built redundancy in the system, which enables all supply areas to be supplied from alternate sources, coupled with the generous storage capacity (97.4 megalitres) has enabled supply to be maintained at all times.

3.3 Water Consumption Trends

Water consumption over the last 20 years is shown in Table 1 below:-

Trends in water consumption can be summarised as:-

20 Year Average Consumption	9924 Ml/year
Ten (10) Year Period 1982/83 to 1991/92 Average:	10038 Ml/year
Ten (10) Year Period 1992/93 to 2001/02	9810 Ml/year
Five (5) Year Period 1997/98 to 2001/02	10316 Ml/year
Entitlement:	12274 Ml/year

Year	Water Consumption (ML)	Population	Peak Day Demand (ML)
1982/83	10234	36684	75.9
1983/84	7796	Data Unavailable	58.0
1984/85	10009	Data Unavailable	73.8
1985/86	11016	Data Unavailable	74.0
1986/87	9774	38704	68.0
1987/88	10701	Data Unavailable	71.5
1988/89	9458	Data Unavailable	60.0
1989/90	10222	Data Unavailable	66.5
1990/91	10704	Data Unavailable	72.8
1991/92	10462	40154	74.0
1992/93	8291	40880	76.3
1993/94	8664	41090	57.3
1994/95	10334	41440	72.1
1995/96	8579	41520	60.0
1996/97	10649	41795	76.5
1997/98	12153	Data Unavailable	71.6
1998/99	10345	Data Unavailable	74.2
1999/2000	8930	Data Unavailable	64.1
2000/01	10132	Data Unavailable	66.9
2001/02	10022	42451	69.0

Table 1: 20 Year Water Consumption

It is significant to note that average consumption over the last 10 years (9810 ML/year) is 2.3% lower than the average consumption for the previous 10 years, 1982/83 to 1991/92, of 10038 ML/year. This reduction in consumption is noteworthy given that the population growth in the 20 year period has averaged 0.82% per year.

There are two explanations for this real reduction in consumption:-

- the City has annually conducted a water conservation campaign since 1994/95 involving media advertising, media articles and provision of a range of water conservation material, including annual production of an advisory brochure which is delivered to every consumer. There is, therefore, a heightened awareness of water use and water conservation actions throughout the City.
- application of a 2 part tariff system for water consumption comprising a charge of:-

12 cents per kilolitre for the first 300 kilolitres
and 45 cents per kilolitre thereafter

The aim is, obviously, to encourage residential consumers to use 300 kilolitres per annum or less. It should be noted that this "threshold" was reduced from 450 kilolitres to 300 kilolitres in 2000/01.

Monthly Water Consumptions for 1997/98 (peak consumption year), 2001/02 and 2002/03 are shown in Table 2 below and Weekly Consumptions for the same years are shown in Table 3.

3.4 Legal and Institutional Context

Management of water supply in NSW is administered by the Local Government Act, 1993 and by the Water Management Act, 2000.

The Local Government Act confers on Council the authority to construct, maintain, operate and repair infrastructure works for the supply of water within its supply district (the boundaries of the City). It also gives Council the right to supply water, as a bulk supply to areas outside its supply district - as is the case with supply to Hume Shire.

The Water Management Act includes a number of processes and principles aimed at improvements to the health of the State's water resources, providing greater economic benefits and shared responsibility for water management.

One of the processes established by the Act is a systematic approach to licensing the water supply for towns, which specifies the amount of water Towns can extract.

The City of Albury draws water from the Murray River which has been classified under the Act as a Priority Catchment. Volumetric Entitlements have been set for Priority Catchments. The City of Albury's entitlement is a High Security supply of 12274 megalitres.

(It should also be noted that the Department of Land and Water Conservation has calculated a "Reasonable Entitlement" for the City of Albury, as follows:-

Reasonable Entitlement	-	Albury	10316 MI
	-	Table Top	138 MI
	-	Hume Villages	461 MI
	-	Wirlinga	<u>10 MI</u>
			10925 MI

(Consumption over the last 4 years has not exceeded this "Reasonable Entitlement".)

Month	Highest Recorded Consumption (Ml)	Year	1997/98 Benchmark (Ml)	2001/02 (Ml)	2002/03 (Ml)
July	585.7	(1992)	519.9	532.2	512.9
August	618.1	(1992)	521.5	515.4	542.6
September	650.5	(1994)	538.4	550.7	614.1
October	965.5	(1997)	965.5	549.5	863.3
November	1260.4	(1991)	1093.7	896.3	1124.8
December	1680.2	(1997)	1680.2	1428.5	
January	1780.4	(1998)	1780.4	1548.1	
February	1673.4	(1986)	1506.4	867.1	
March	1602.7	(1986)	1546.1	1160.3	
April	969.1	(1986)	900.8	729.8	
May	835.6	(2001)	589.4	695.4	
June	553.5	(1992)	510.9	548.4	

Table 2 Monthly Water Consumptions

	Week	1997/98		2001/02		2002/03	
		Weekly Consumption (ML/week)	Max. Day (MI)	Weekly Consumption (ML/week)	Max. Day (MI)	Weekly Consumption (ML/week)	Max. Day (MI)
	1	116.4	18.9	129.8	21.2	114.5	20.3
	2	111.9	17.4	120.3	18.9	123.5	26.6
July	3	123.7	19.3	115.4	19.8	115.0	20.5
	4	120.6	18.7	119.6	19.3	103.8	17.2
	5	115.8	18.1	113.4	19.4	119.0	20.1
	6	127.7	20.0	116.4	20.8	111.2	19.3
August	7	107.9	17.8	123.0	20.8	115.9	20.1
	8	117.0	18.5	111.6	19.4	144.9	28.0
	9	117.2	18.4	113.5	20.5	136.7	25.6
	10	115.7	18.7	116.0	19.4	126.1	28.6
September	11	114.7	18.5	117.0	23.0	131.7	23.0
	12	131.0	21.7	134.5	26.7	160.9	32.3
	13	129.2	20.4	137.9	29.3	146.7	27.4
	14	145.6	24.9	122.6	24.5	158.2	25.7
October	15	152.9	26.3	121.4	22.1	170.1	27.6
	16	184.6	31.1	114.1	18.0	179.7	38.3
	17	242.3	41.3	139.5	30.4	211.5	35.2
	18	296.9	46.4	139.4	29.5	228.6	39.6
November	19	179.5	42.9	169.3	35.3	249.9	42.9
	20	247.1	41.4	159.5	33.9	297.9	45.6
	21	229.9	43.4	218.9	39.3	277.2	46.8
	22	364.9	65.9	269.8	50.5	236.4	44.1
	23	319.3	55.2	324.0	55.6		
December	24	380.4	63.2	284.2	53.2		
	25	317.0	61.5	386.1	55.2		

	26	397.3	63.2	284.6	57.9		
	27	448.4	71.6	320.5	63.5		
	28	404.9	62.2	365.5	64.0		
January	29	361.8	66.7	384.7	62.4		
	30	459.1	68.6	334.7	66.7		
	31	372.0	68.4	341.5	55.4		
	32	425.7	65.1	277.0	56.6		
February	33	349.0	66.4	189.8	45.3		
	34	331.9	57.4	215.4	48.9		
	35	402.5	67.1	184.9	37.7		
March	36	387.2	66.7	245.7	39.9		
	37	366.0	61.4	308.8	51.7		
	38	327.8	63.9	299.8	51.5		
	39	354.5	54.2	241.3	47.9		
April	40	305.1	49.1	167.2	33.7		
	41	326.6	58.2	191.3	35.2		
	42	209.5	52.0	152.0	29.0		
	43	154.2	26.8	177.6	34.8		
May	44	128.2	21.4	159.0	30.4		
	45	136.2	21.4	182.3	28.4		
	46	136.3	23.6	162.3	34.9		
	47	136.9	27.2	119.1	24.0		
	48	129.3	21.2	126.5	21.9		
June	49	125.9	20.2	140.4	25.1		
	50	112.9	18.4	110.6	19.5		
	51	112.9	18.2	121.8	22.8		
	52	127.1	22.1	113.1	20.0		

Table 3: Weekly Consumption

3.5 Water Quality Issues

In times of drought or low summer flows in the Murray River, water quality may decline noticeably, with increased levels of turbidity and salinity expected. Algal blooms, even blue-green algae, may be an issue.

With respect to salinity, even at very low flows this is not expected to rise above 500 E.C and, therefore, is not considered an issue.

Increased levels of turbidity and algae can be accommodated by the filtration plant, simply by increasing the frequency of backwashing. The Filtration Plant has a capacity to treat 140 megalitres/day and the highest recorded demand, to date, has been 76.5 megalitres/day (in January 1997). There is, therefore, almost twice the capacity required, which will facilitate shorter filter run times and longer backwash times. Should toxicity become a problem, a GAC (granulated activated carbon) unit can be readily incorporated into the process.

All backwash water is monitored for MIB and Geosmin and a licence to discharge this contaminated water is available from NSW EPA.

3.6 Plan Objectives

3.6.1 General

A set of objectives is required for a Drought Contingency and Emergency Response Plan in order to give the Plan direction and purpose. Also, the effectiveness of drought assessment and response activities will be difficult to monitor and evaluate without a clear set of objectives.

There are essentially three types of goals to be considered, namely:-

a) Strategic:

to address overall objectives for drought and emergency response which are linked to other strategic objectives of Albury Water.

b) Planning:

to address future infrastructure and supply needs and linked to the overall planning objectives of Albury Water.

c) Operational:

to translate the strategic objectives into specific responses and management actions.

3.6.2 Strategic Objectives

To ensure a systematic, timely, effective and efficient response to drought and emergencies which minimises disruption and adverse impact on customers by:-

- ensuring timely warning of any potential water shortages or supply disruptions and having in place ready response strategies.
- Identifying and responding to long term planning issues to ensure financial capacity to implement necessary infrastructure installation.

6.3 Planning Objectives

To ensure that in the short term:-

- consumers are made aware of the development of the Response Plan to ensure all stakeholders have an understanding and an ownership of the Plan.
 - the Plan identifies all the necessary steps that need to be taken throughout a drought or emergency, including identification of triggers which instigate implementation of management actions.
 - the Plan is subject to monitoring and regular review as the system develops
- and
- the Plan is monitored and reviewed throughout the course of a drought or emergency and adjusted where necessary.

and that in the long term

- the agreed level of service, including security of supply satisfies the requirements of Albury Water and its customers at an acceptable cost.
- and
- all feasible options for achieving a balance between supply and demand are evaluated in terms of impact on customers.

3.6.4 Operational Objectives

To ensure that in the **short term**:

- in all droughts a minimum supply of at least 60 litres per person per day is provided to accommodate the minimum requirements for health and sanitary purposes.
- the most efficient use is made of water resources during periods of water shortage.
- a reliable assessment of drought or emergency status is made so that the City of Albury is aware of what stage of a drought applies and/or how severe the emergency is.

and that in the **long term**:

- the City of Albury is kept informed of demand patterns and customer expectations in relation to desirable levels of services, so that assessments can be made of system reliability during future droughts/emergencies.
- emergency measures caused by supply shortfalls beyond Stage 4 restrictions are not required more often than in 2% of years; that the duration of restrictions (during drought) not exceed 3 months; that the duration of interruption to supply during an extreme emergency not exceed 4 weeks and that the portability of restrictions in any year is, on average, no greater than 10%.

4. **RESPONSE OPTIONS**

4.1 **Introduction**

Response options can be generally classified under two broad categories:-

- demand management
- supply enhancement

In this Section of the Plan, demand management and supply enhancement options to be applied by Albury Water are outlined.

4.2 Water Conservation Strategy

The City of Albury has, for a number of years, worked hard at managing the city's water consumption.

An annual campaign, involving media advertising, media articles and a letter box drop is conducted every spring/summer (October to February) requesting that customers voluntarily reduce consumption as well as providing helpful "tips" on how to save water - particularly in relation to garden and lawn watering. This water conservation message is also reinforced via Council's Phosphorus Action Campaign advertising and the Urban Salinity Management Program.

These campaigns are backed up by a two-tier charging policy which effectively rewards consumers who use 300 kilolitres or less per year.

The two-tier charges are:-

Consumption	0-300 kl/year @ 12 cents per kilolitre
Consumption	> 300 kl/year @ 45 cents per kilolitre

The "penalty" charge for usage over 300 kilolitres per year relates to a multiplier of 3.75.

The on-going "voluntary" water reductions and conservation campaign will involve:-

- production of advertising messages, focussing on helpful ways to reduce water consumption.
- annual advertising campaigns via all local media.
- production and distribution in October of each year of an information brochure, to be delivered to all residences in Albury and Hume Shire (Jindera, Table Top and Hume Villages).
- annual review of charges to ensure that incentives to reduce consumption are current.
- regular media articles to alert the community about trends in consumption, particularly when usage exceeds targets.
- where necessary and justifiable, requests will be made to residents to voluntarily refrain from fixed sprinkler watering, washing of cars etc, (triggers for a call for voluntary reductions would be Total Fire Ban days or when the temperature is predicted to exceed 36°C).

Targets for water consumption in the City will be:-

Annual Consumption	10,925 megalitres (equating to assessed reasonable entitlement)
Peak Day Demand (previous recorded maximum day demand: 76.51 MI in Jan 1997)	75 MI/day
Growth in Demand:	Not to exceed 0.5% p.a.

(NOTE: These targets are based on 2001/02 usage rates).

4.3 Demand Reduction During Drought

Although the supply for Albury is a secure supply from the Murray River, there may be occasions when restrictions need to be imposed to cater for drought conditions and to ensure adequate flows are maintained in the River. There has been no historic occurrence of such a reduction in supply. Restrictions are only expected to occur when DLWC makes allocations of less than 100%. It is understood that the probability of this occurring is 4% (ie 4 years out of every 100 years).

In the current drought (2002/03), Council at the request of DLWC initially imposed a moderate form of restriction namely:-

"When the temperature is forecast to reach or exceed 38°C, then hand held hoses only may be used for garden watering and outdoor use between the hours of 7am and 9pm. Fixed sprinklers will only be allowed between 9pm and 7am."

This was amended by Council on 25 November 2002, by the general introduction of Stage 2 restrictions, regardless of temperature.

The Stages that will be applied by Albury Water under declared drought conditions are as follows:- (It should be noted that no restrictions will be imposed on water dependant industries, except under Emergency Conditions - Stage 5).

Stage 1: Voluntary Reductions

To be implemented when consumption approaches target trigger levels. (ie approaches benchmark consumption trend line, as defined by 1997/98 consumption trend).

The process will rely on a public awareness campaign and will target voluntary restrictions on

garden watering, particularly via the use of fixed sprinklers.

Stage 2: Low Level Restrictions

To be implemented when requested by DLWC or the Murray Darling Basin Commission and may or may not be tied to forecast temperatures.

Trigger Level: Consumption reaches and exceeds benchmark consumption trend line.

The restrictions will place a ban on sprinkler use between 7am and 9pm daily. That is, garden watering will be restricted to hand held hoses only between these hours.

Stage 3: Moderate Restrictions

To be implemented when requested by DLWC or MDBC and/or when demand is predicted to approach available capacity to supply.

Trigger Level: Consumption exceeds benchmark consumption trend line for 4 weeks.

The Restrictions will entail:-

- a total ban on the use of sprinklers.
- garden watering to be restricted to hand held hoses.
- garden/lawn watering only to occur between the hours of 9pm and 12pm (midnight).
- where deemed necessary and appropriate, a roster system for garden watering may be introduced, based on an odds and evens, home numbering system. (For example, odd numbered houses to water Sunday, Tuesday and Thursday. Even number houses to water Monday, Wednesday and Friday with Saturdays being a "garden watering free day".)

Stage 4: Severe Restrictions

To be implemented when required by DLWC and/or MDBC and when demand is likely to exceed capacity to supply.

Trigger Level: Consumption exceeds benchmark consumption trend line by more than 10% for 6 weeks or longer.

The restrictions will entail:

- a total ban on garden and lawn watering.
- a total ban on domestic car washing and other forms of external use.
- restricted standpipe use.
- agreed reductions in industrial and commercial use.

Stage 5: Emergency Restrictions

To be implemented in extreme conditions of water shortage. This is an extremely unlikely event and would only apply when river flows approach a cease-to-flow condition.

Under these conditions, supply would be restricted to 60 litres per person per day.

This would probably only occur in the eventuality that water would need to be tankered in and distributed via the City's Service Reservoirs (which have a combined storage capacity of 97.4 ML).

It may be necessary to access ground water supplies under such emergency situations and a possible source would be the ground water reserves available via the Quarries adjacent to Wonga Wetlands, Riverina Highway, Splitters Creek. Local area bores could also be used for emergency supplies.

4.4 Demand Management During Emergencies

The situations which would trigger an emergency response are listed in Clause 1.3 and are repeated below:-

- contamination of the water supply, either at the source (Murray River) or within the City's supply system.
- concentrations of algae or suspended material in the raw water supply causing substantial loss of filtration capacity.
- widespread power failure affecting transmission of raw and/or filtered water.

- major system failure, including failure of major distribution mains, service reservoir(s) or distribution pumping stations.

Another eventuality, which has been addressed under Clause 4.3 is the extremely remote event of flow cessation in the Murray River.

Typically, inability by Albury Water to supply is restricted to distinct areas within the supply system and local area restrictions are normally put in place to manage these situations.

The responses which apply to various emergency situations are listed below:-

Level 1 Response: Local Area Interruption to Supply

This may occur as a result of:-

- a burst water main
- failure of a supply zone pumping facility
- necessary maintenance works, such as mains flushing, disinfection and repairs

Procedure:-

- all affected residents are notified of the interruption and advised of the likely time to rectify the fault.
- alternative supply options within the system are investigated and actioned if possible.
- if the interruption is expected to last longer than 12 hours, alternative supply sources are initiated.
- Stage 3 water restrictions implemented.

Level 2 Response: Widespread Interruption to Supply

This may occur as a result of:-

- major, system wide, power failure.
- failure of the water filtration plant.
- failure of a major pumping station.
- burst of a major distribution pipeline.
- failure of a service reservoir.

The Albury supply system has considerable in-built redundancy, such that most supply districts can be supplied from alternate sources. This makes the above eventualities reasonably unlikely. However, the following procedures shall apply in such an emergency.

Procedure:-

- all affected residents are notified of the interruption and advised of the likely time to rectify the fault.
- alternative supply options within the system are investigated and actioned if practicable.
- if the interruption is expected to last longer than 12 hours, alternative supply sources are initiated.
- residents are advised to implement Stage 4 Water restrictions until fault rectified.

Level 3 Response: Extreme Emergency

This may occur as a result of:-

- projected long term interruption to supply caused by contamination of supply.
- prolonged outage at water filtration plant.
- severe power failure.
- major system failure.

This is typically an event which will require more than 1 day and less than 5 days to rectify. Under this scenario, the storage capacity within the Service Reservoirs (97.4 ML) would be sufficient to supply the winter/low demand of 19.5 ML per day for 5 days.

The procedure which would apply is:-

Procedure:

- immediate implementation of Stage 4 water restrictions. (That is, supply for household use only).
- implementation of a widespread awareness campaign to alert the community, to advise them of Stage 4 restrictions and to encourage them to be conservative with their in-house water use.
- negotiate with bulk and industrial water users to implement emergency water use provisions.

- careful monitoring of water use throughout the supply area.

If the situation cannot be rectified in 5 days or less, the following procedure will apply.

- immediate implementation of Stage 5 restrictions.
- arrangements made to cart in water from the Quarry supply at Splitters Creek, with discharge into appropriate service reservoirs. This is an extreme event and would require mobilisation of a large number of suitable tankers.
- advise industries and commercial premises of the emergency and seek co-operation in water reduction measures.

It is envisaged that the Army would need to be deployed to provide this supply, especially for prolonged periods.

4.5 Fire Fighting Requirements

Under all Demand Reduction options, preference will be given to accommodating fire fighting requirements.

The bottom 10% of all water stored in service reservoirs will be reserved for fire fighting requirements.

Even under Emergency Restrictions, approximately 10 megalitres of water will be stored in service reservoirs and reserved for fire fighting purposes.

Should an emergency last for more than 5 days, Fire Services will be directed to Murray River for supplies or to the secure groundwater source at the Quarry, Splitters Creek.

5. MONITORING

Albury Water monitors City-wide consumption on a daily basis. During water restriction periods or emergency situations, monitoring can be stepped up to hourly usage.

Since the City has not experienced major water restrictions in the past, there is no data available to accurately determine the likely impact of the various stages of restrictions on demand patterns.

It is estimated that for the peak summer demand that usually occurs in December/January, the demand could be reduced by as much as 70% under Stage 4 Restrictions.

However, since this has not been verified, it is very important to carefully monitor demand patterns during a drought and whilst restrictions are in

force, to assist in determining the relative reductions in total demand that can be obtained from each of the stages of restriction proposed.

6. MEDIA/COMMUNICATION STRATEGY

Council's media/communication strategy is as follows:-

1. *General Water Conservation Campaign*

Council will annual conduct a media campaign to provide the community with information and tips on ways to effectively conserve water.

This Campaign will be conducted via all media outlets (newspapers, radio and television) as well as via Council's own publications (Albury in Focus, Accent on Albury, Management Plan etc) and there will also be a direct letter box drop to all residences in Albury and Hume Shire.

2. *Notification of Restrictions*

These will be communicated to the community via:-

- Public notice in Border Mail
- Notice in Council's City of Albury in Focus
- Radio announcements
- Television announcements
- General media releases

3. *Emergency Situations*

These will be communicated to the community via:-

- Public notice in Border Mail
- Radio announcements
- Letter box drop to all affected residences

7. ENFORCEMENT

Restrictions will be enforced by Council's Ordinance Officers who are empowered under the Local Government Act (1993) to issue infringement notices.

Under Section 5, Part 2 of the Local Government (Water Services) Regulations 1998, Council is empowered to restrict water supply (by public notice published in a newspaper circulating within the Council's area; ie the Border Mail).

Under Section 637 of the Local Government Act 1993, the Penalty which will apply is a maximum of \$2,200 as follows:-

Maximum penalty:	20 penalty units
Current Penalty Unit:	\$110

8. REVISIONS

It is proposed that this Plan be reviewed annually and any revisions formally recorded on a Record of Document Control.

A data base of all recipients of the Plan will be established, so that revisions can be managed and disseminated appropriately.

9. CONTACT LIST

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5. Murray Darling Basin Commission - Murray River Water

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APPENDICES

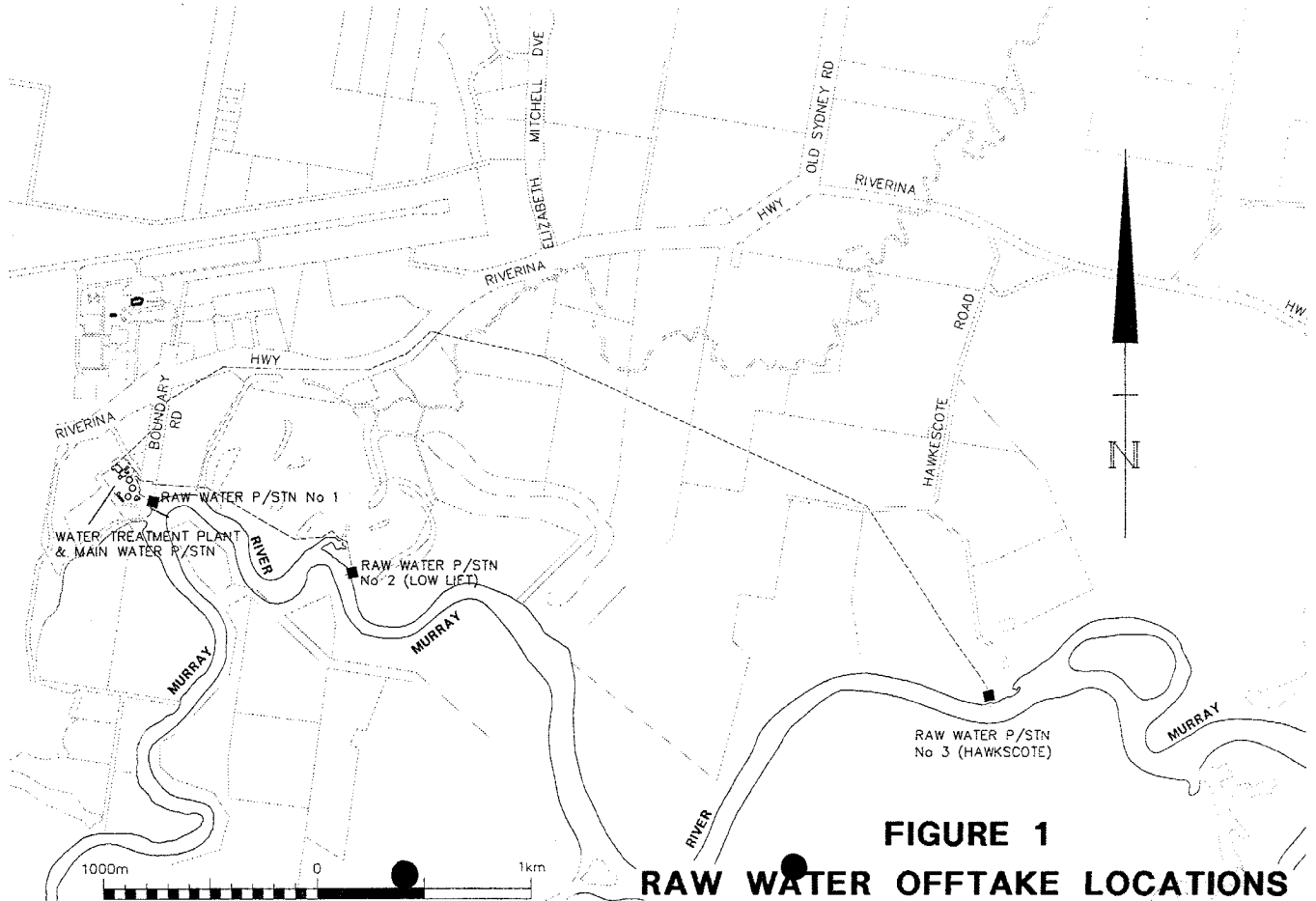


FIGURE 1
RAW WATER OFFTAKE LOCATIONS

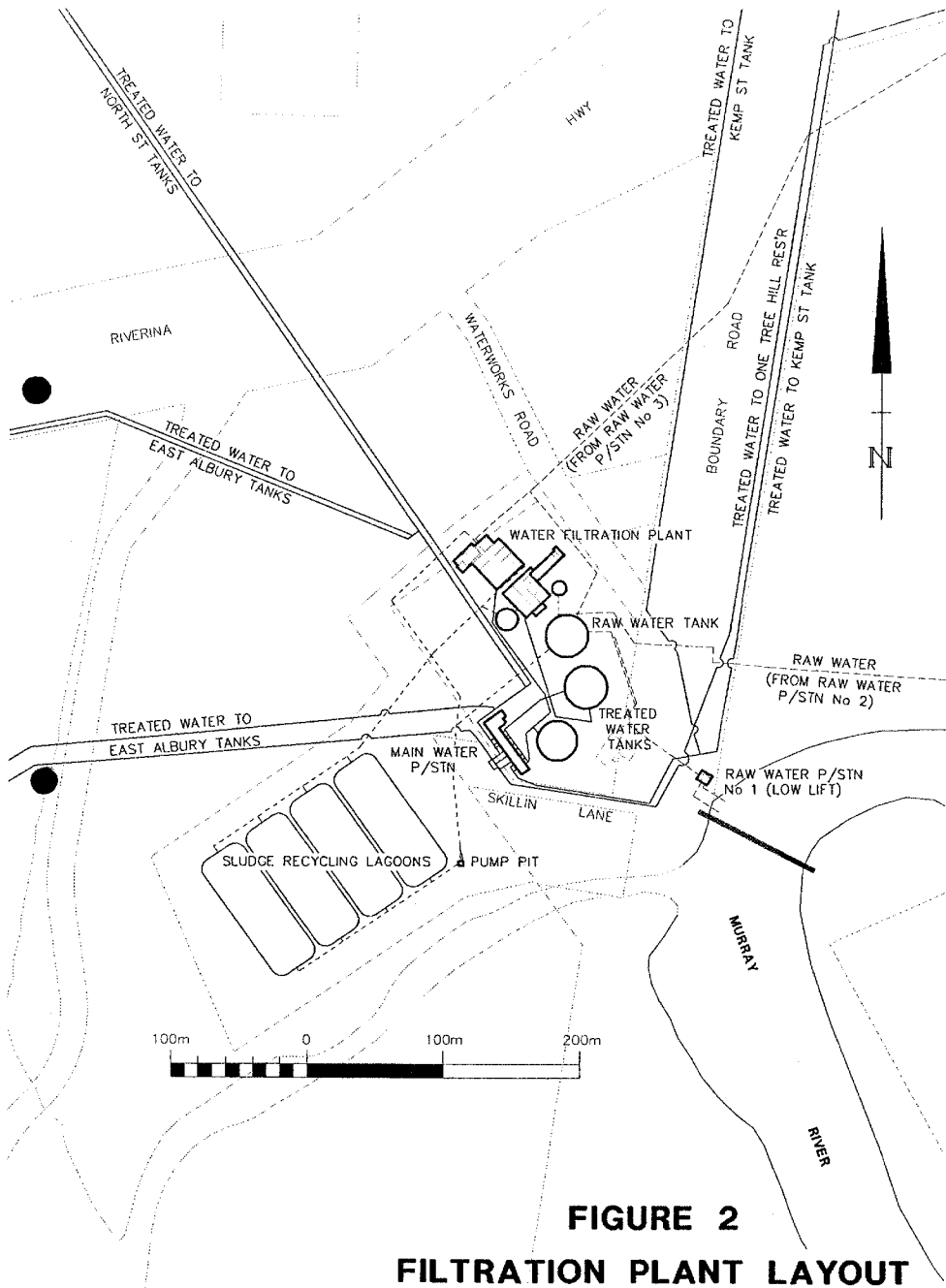
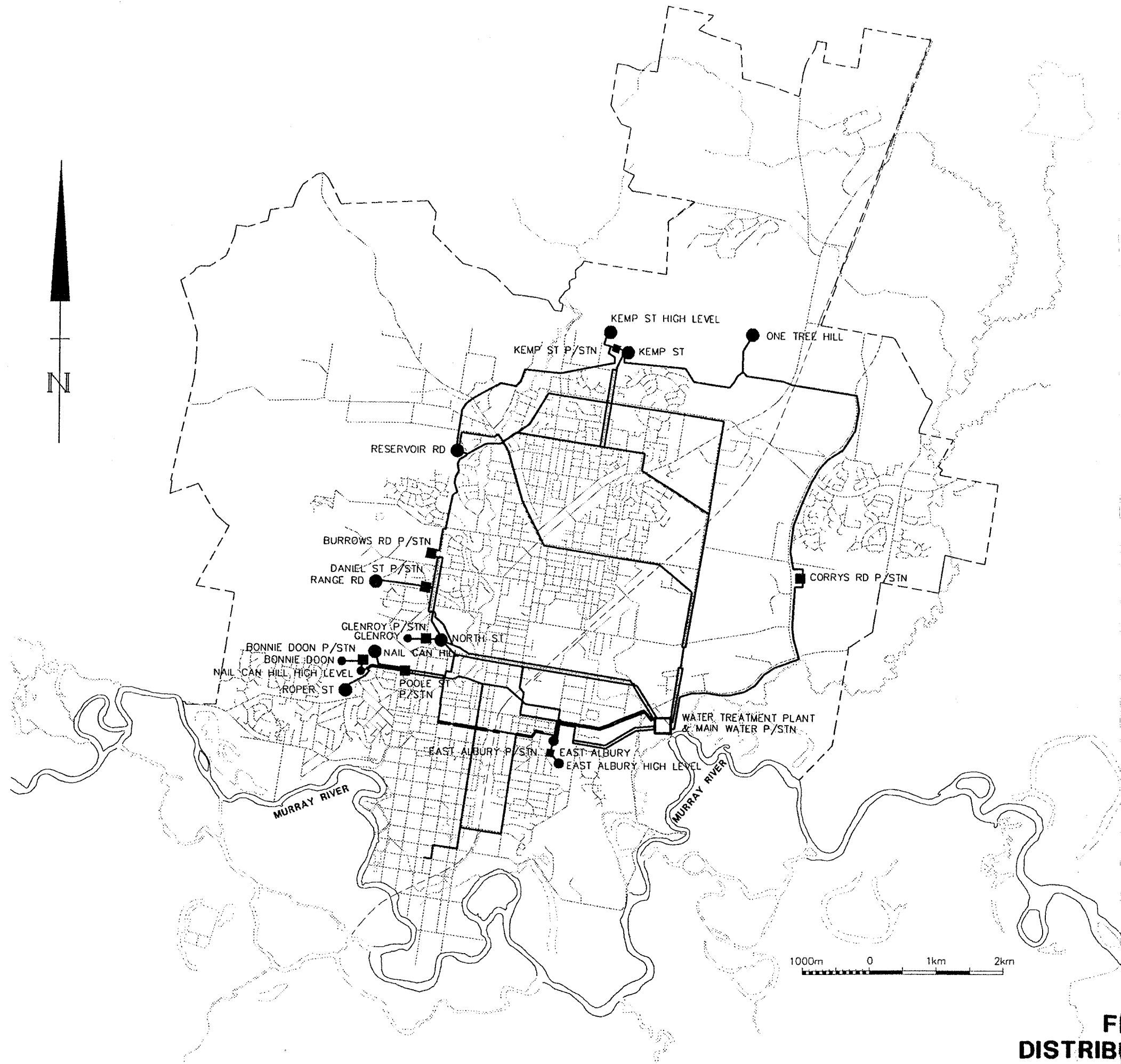


FIGURE 2
FILTRATION PLANT LAYOUT



**FIGURE 3
DISTRIBUTION SYSTEM**

SCHEDULES

SCHEDULE 1: SUMMARY - LEVELS OF WATER RESTRICTIONS: VARIOUS CONSUMERS

TYPE OF CONSUMER	STAGE 1	STAGE 2	STAGE 3	STAGE 4	STAGE 5
DOMESTIC Gardens and Lawns Window Cleaning and Car washing Washing of Boats, Boat Motors and Trailers etc Swimming Pools - Private Washing of driveways, paved areas and roofs	} } } } }	} } } }	} } } }	} } } }	} } } }
BUSINESS/COMMERCIAL PREMISES ETC Public Gardens Sports Grounds Market Gardens, Orchards, Nurseries, Commercial Flower Gardens and Irrigation Installation Companies Washing Motor Vehicles Washing of Buses, Taxis, Food Transport, Ambulances and Garbage Vehicles Brick Cleaning, Carpet Cleaning, Car Detailing and Underboring Building	} } } } } }	} } } } }	} } } } }	} } } } }	} } } }

<p>New Turf</p> <p>Washing of paved public areas, where food is prepared or consumed, or for health reasons</p> <p>Water Cartage</p> <ul style="list-style-type: none"> - Potable Supply - Use of Standpipes <p>Auto Flush Urinals</p>	<p>} Voluntary Reductions</p>	<p>Sprinklers to be used <u>only</u> between 9pm and 7am</p> <p>No Restrictions</p> <p>No Restrictions - Private Carriers must be registered with Albury Water</p> <p>No Restrictions</p>	<p>Water in - then sprinklers 2hr/day for 10 days only between 9pm and 7am</p> <p>No Restrictions</p> <p>No Restrictions - Private Carriers must be registered with Albury Water</p> <p>No Restrictions</p>	<p>} Banned</p>	<p>} Banned</p>
<p>INDUSTRIAL All local industries</p>	<p>No Restrictions</p>	<p>No Restrictions</p>	<p>No Restrictions</p>	<p>No Restrictions (agreed reductions in usage)</p>	<p>Negotiated Shutdowns</p>

**SCHEDULE 2: HOURS OF USAGE CHARTS FOR DOMESTIC USERS
STAGE 3 RESTRICTIONS**

LEVEL 3

Hand Held Hoses	MON	TUE	WED	THU	FRI	SAT	SUN
Even Street Numbers	None	7-10pm	None	7-10pm	None	7-10pm	None
Odd Street Numbers	None	None	7-10pm	None	7-10pm	None	7-10pm
<i>Micro Sprinklers permitted for ½ hour, 6:00pm - 6:30pm on your allocated day</i>							

Eastern Standard Times

Hand Held Hoses	MON	TUE	WED	THU	FRI	SAT	SUN
Even Street Numbers	None	6-9pm	None	6-9pm	None	6-9pm	None
Odd Street Numbers	None	None	6-9pm	None	6-9pm	None	6-9pm
<i>Micro Sprinklers permitted for ½ hour, 5:00pm - 5:30pm on your allocated day</i>							

Daylight Saving Times