

Submission No:	536
Date Received:	11/1/11
Secretary:	SC

WATER ACT 2007

Submission re "Water for the future" as
invited on the Government web page .

To Hon Tony Windsor
Chairman
House of Representatives
Standing Committee on Regional Australia
Murray Darling Basin Inquiry

From:- R.G.McComb
Municipal Engineer Victoria
Water Supply Engineer Victoria
Licensed Land Surveyor Victoria
Formerly M.I.E.Aust.
Formerly M.I.S. Aust.

1 Introduction

Following a period of approximately ten years of drought the severity of which was apparently of the order of 1 in 100 years the Federal Government became concerned with the effect of the drought on the Murray Darling Basin. Historically the Basin has been affected by droughts of varying severity for all of its known history. The basin is composed of approximately two thirds of New South Wales, most of Victoria north of the great dividing range, the border river area of southern Queensland, and a portion of S.E. South Australia.

State Governments have for over one hundred years sponsored irrigation for the production of fresh fruit, and vegetables, dairying, preserved fruit industries, tobacco, rice, cotton, and other crops, such as wine grapes.

In order to attempt to guarantee water supply major storages have been constructed during the past, more than, one hundred years. Each State Government has obviously considered irrigation as a very, if not extremely, important facility for primary industry. The result of this activity has resulted in the Murray – Darling Basin becoming an essential food basin for Australia, if not the most important food basin for Australia.

The “Basin” is huge, it is hugely diverse to the extent that each tributary catchment has distinctly unique characteristics, which coupled with the hugely varying rainfall and loss characteristics make it virtually impossible to apply a singular policy over the whole area.

The Commonwealth Water Act of 2007 sets up a Murray Darling Basin Authority with powers over State Authorities and individual water rights.

The primary difficulty with the Act appears to be that it will require a bureaucracy as big as the combined existing State departments in order to give effect to its intentions.

It is felt that the Commonwealth Government should restrict its role to one of financial provision and supervision of State Instrumentalities.

The Water Act of 2007 and the National Broadband Network are both ad hoc proposals which do not form part of an overall future plan for the future of the Nation. Given the inevitable growth in population an overall plan for the provision of food, services, and infrastructure, on a ten to fifty year basis seems appropriate. This report proposes three methods of possible Drought alleviation by supplementary delivery of additional water to some of the worst affected catchments in the Murray- Darling system.

2 Some known anomalies

Perhaps the best known and most outstanding anomaly is the Cubbie Station huge quantities of water are dammed and evaporated from direct channeling of the border river system and used for flood irrigation to grow cotton. Surface water is also harvested, so that downstream users become reliant on excess flows.

Whereas the Water Act 2007 envisages preferential treatment to human consumption in respect of those communities “**dependent**” on Murray Darling water this brings up the contentious question of supplying communities such as Adelaide taken to supplement their water supply.

Most storages within the Basin are relatively deep whereas those on the Darling are relatively shallow, such as Lake Victoria and the Menindee Lakes. This means high evaporation rates, progressively increasing with falling water levels.

Recent construction of the “goldfields” pipeline Bendigo to Ballarat, the “Sugarloaf pipeline Goulburn River at Yea to Melbourne, and the Melbourne – Geelong pipeline, by the Bracks/Brumby Government in Victoria have added the three largest cities in Victoria to the consumers of Murray /Goulburn water.

3 Rainfall Patterns vary across the Basin Area

Appendices “A and B” indicate winter and summer rainfall reliability patterns for Australia. It may be seen that the Darling river catchment and that of the Lachlan do not fall in either category for reliable rainfall. Communities living within the monsoonal rainfall areas on the other hand can expect hundreds of millimeters of rainfall during the wet season from October to April the following year, the extent of, and reliability of, rainfall increasing towards the coast. Recently Mr John Elliot of Melbourne (formerly Carlton Football Club President) mooted on A.B.C.’s Q&A, that water from the Ord River Scheme should be diverted into the Murray Darling Basin. A pipeline of some 2300 Kms with approximately 12 pumping stations may be feasible, in a fifty year plan. Currently attention should be given to diverting coastal or monsoonal rainfall runoff from North Queensland to the head waters of the Darling river. Similarly coastal river water should be diverted into the headwaters of the Lachlan.

4 Factors affecting water Entitlements and the value of Buy backs

(a) Equity factor

Soldier settlement properties near Griffith have been irrigating for nearly 100 years and similar situations exist around Mildura. Any farm with freehold Title that has been virtually guaranteed water by a State Authority for up to 100 years or more should have an Equity factor of one. Again it is not possible to compare different catchments because some may totally consist of relatively recent grants of water rights. For example Eildon (Victoria) was re-built in the mid 1950's whereas Burrinjuk was built around 1905. However it is considered that the longest standing irrigator in a given catchment should have a higher priority for water against a more recent irrigator, and his water right should have higher valuation.

(b) Crop Factor

Some crops such as rice and cotton are high consumers of water and therefore are not priority crops when there is a water shortage. Fresh fruit and vegetables, together with the canned variety, together with dairy produce, on the other hand are very important crops for the population at large, particularly, in drought conditions, a plentiful supply of water would keep prices of these items down.

(c) Farmer efficiency

This factor is self explanatory obviously some farmers will be more efficient than others.

(d) Soil Type Factor

Some soils are suitable for productive irrigation and others not as suitable. Buy backs should be weighted in favour of eliminating less productive land.

(e) Irrigation Method and Efficiency

Flood Irrigation compared with spray, drip, or channelled irrigation should be rated for efficiency.

Summary and Conclusion :-

All of the above factors should be considered in determining water allocations and particularly in water buy back situations so that the least viable properties are subject to water right buy back giving the more viable properties a chance of better water access.

5 Flood Mitigation Dams and Water Supply

Sir R.L. East former chairman of the Victorian S.R.&W.S.C., after a visit to the U.K., was responsible for the creation of The Dandenong Valley Authority in the late 50's or early 60's. The driving force behind this outstanding Engineer was his experience of the 1934 flood where water depth of 4.3 metres was found at the intersection of Springvale Road and Wells Road east of Edithvale. Retarding basins were constructed throughout the Dandenong Valley Authority's area and became part of the philosophy for Drainage Engineers to the extent that some Municipal Councils were insisting on back or front yard retention on residential allotments to relieve pressure on a given stormwater system. Apart from man made retarding basins there are naturally occurring basins such as the Belfast Lough on the Moyne River at Port Fairy Victoria.

Following the disastrous flooding in Brisbane around 1974 a flood mitigation dam was built on the Brisbane river north of Ipswich. (The Wivenhoe).

Amazingly the Bligh Government counted this dam as part of the Brisbane Water Supply system during the severe drought conditions leading into the summer of 2009/10. During late winter and early spring 2010 following substantial rain the dam became full causing some anxt when storms of some intensity threatened.

Adequate call for retardation dams that could supplement water supply has recently been demonstrated on the Ovens Campaspe, King, and Goulburn Rivers in Victoria and on the Dawson Fitzroy, Nogoa, Condamine and Burnett Rivers in Queensland. However it must be stated that the volumes of water involved in central Queensland would involve gigantic Flood Mitigation Dams so that other protective measures should be considered. In addition flooding on the Leichardt and Flinders Rivers in Northern Queensland is common as is water storage shortage so that additional flood mitigation storage could be fruitful.

Retarding Basins such as Wivenhoe require very astute management to avoid flooding downstream and to provide some water in drought conditions. The trauma and property loss that could possibly be avoided by providing such dams appears to warrant their construction when the secondary consideration of water supply or water management comes into play.

6 Recent Technological advances relevant to River Management

Around 1975, Victorian Engineers were introduced to "R.O.R.B.", the Monash University's runoff routing computer model for Urban and Rural drainage schemes and of course river systems. Originally it was introduced on the campus main frame which used a Basic language compiler, fortran versions were made available for private consultants to use on the then available 8 bit personal computers, which were limited to 64k or less of ram and rarely had a hard drive. With modern personal computers the way is now open to model huge and complex river systems. A slight difficulty exists(not with RORB) with

6 (Cont)

the modeling of Tidal Estuaries because of the Ghyben-Herzberg effect as the fresh water body enters the salt water body (two immiscible fluids) causing a surge in the height of the fresh water, but this is hardly relevant to the Murray Darling system.

Aerial Photography has been used since World War 1 to determine features on large tracts of land. During World War 2 photogrammetry was developed to a fine art, so that it became possible in the late sixties with low level (500metre) photography and modern electronic distance measuring equipment to map surface features including detailed urban areas at plan scales of up to 1in500.

Photogrammetry has largely been superseded by automatic Total Stations for mapping surface features.

In 1998 laser aerial photography was introduced to Australia. The advantage of laser photography is that it enables under water surface mapping. The hydrographic section of the R.A.N. claim that up to 50 metre depth can be sounded with laser aerial photography. Recently the Belfast Lough was mapped for a flood study of the Moyne River at Port Fairy Vic. Prior to 1998 the under water surface of the Lough could only have been mapped by soundings from a boat and some surface system for fixing the position of each individual depth measurement

Laser aerial photography opens the way to determine the capacity of any lake swamp or dam to a depth of 50 metres and obviously could be used to determine the amount of siltation where this could be an issue.

7 Hydrology and Climate Change

Rainfall, drought and flood levels, have only been kept in Australia for an absolute maximum of 200 years. The Institution of Engineers Australia has done extremely meritorious work in determining methods of predicting rainfall intensity for various sections of the country, however it must be emphasized that this is based on the relatively scant records available. Led by the C.S.I.R.O. local, state, and federal governments have accepted as inevitable that **Climate Change is Real** .

If we accept that climate change is real then we must accept that drought and flood will intensify in the future.

Recent flooding in central Queensland has seen an area as large as Texas or as large as France and Germany combined inundated with millions of dollars worth of damage to crops ,the same for roads and infrastructure not to mention household losses.

The most striking feature of the images depicted on television is that hundreds of homes have been built below flood of record level resulting in catastrophic uninsured damage for the individual householders. I am not aware of the legislation in Queensland but in Victoria the 1958 Local Government Act generally prohibited building below flood of record level. There were exceptions , but clearly this would be an appropriate move for Queensland.

7 (Cont)

World best practice is to determine the 1 in 100 year flood level for fixing floor levels in areas subject to inundation. This practice has been the subject of some debate and may be costly and time consuming in some instances, making it practical to build to the flood of record level.

The relevance of the central Queensland floods to the Murray –Darling basin is that hundreds if not more Gigalitres of fresh water is being discharged to the ocean within a relatively short distance from the headwaters of the Darling river.

Droughts are frequent in Victoria particularly affecting the Melbourne metropolitan water supply. The recent 10 year drought affecting theMurray-Darling Basin has been calibrated as a 1 in 100 year drought. The Murray – Darling river system has been known since the early fifteenth century (see Ref1)but droughts have not been recorded for very long comparatively.

There is some archaeological evidence of a cataclysmic drought in the southern area of central Australia it must be assumed that this was caused by an unusual atmospheric disturbance of large magnitude.

Having regard to the recent drought and the possibility of further worse droughts it appears of primary concern to take bold ! positive action to attempt to drought proof Australian irrigation and Water Supply systems.

8 CONCLUSION AND RECOMMENDATIONS

As previously indicated the Murray – Darling basin is a huge complex system. Recommendations can only be made on a preliminary basis because of the complexity of the various factors that may affect a final result and the limitations of one individual's conception. In order of perceived priority it is recommended:-

1. Review the capacity of the Menindee Lakes and Lake Victoria with a view to increasing storage ,preferably with a deep storage.
2. Conduct a feasibility study of providing additional water to the head waters of the Darling River (Warrego) from the Fairburn Dam, providing estimated costs, estimated yield, evaporation ~~and seepage losses~~ , together with a study of raising the dam wall, as a water supply and small flood mitigation measure.

8 CONCLUSION AND RECOMMENDATIONS (Cont)

3.

Conduct a feasibility study of providing for the provision of a pipeline from Lake Dalrymple to Fairburn Dam.(As above all relevant factors to be accounted for.) It should be noted that the current combined capacity of the before mentioned storages amounts to seven times the volume of Sydney Harbour.

4.

The Wyangala Dam on the Lachlan River was arguably the most affected storage in the system, capacity falling to around 5% in January 2010. It is recommended that an investigation be carried out on the possibility of diverting water from the Warrangamba Dam which is favourably situated on the coastal side of the divide to the Abercrombie.

Finally the Murray- Darling Basin in drought and flooding in central and north Queensland are in my opinion the most important issues/problems that Australia has ever faced (outside War). The Commonwealth Water Act of 2007 is myopic very limited or constricted whereas the problem needs a very broad approach that considers all of the possible options no matter how extreme they may at first appear.

Post Script:-

The construction of the so called Sugarloaf pipeline of some 70km from Yea to Melbourne is a major undertaking involving three pump stations one of which is a high lift station and an elaborate intake structure. The cost of 750 million dollars gives a cost of 10.7 million dollars per kilometre.

The following "guesstimates" are

1. John Elliot's pipeline from the Ord to the Darling \$24.6 Bn
2. Pipeline Fairbairn to Carnarvon \$1.3 Bn
3. Pipeline Dalrymple to Fairbairn \$3.3 Bn
4. Pipeline Warangamba to Abercrombie \$461M

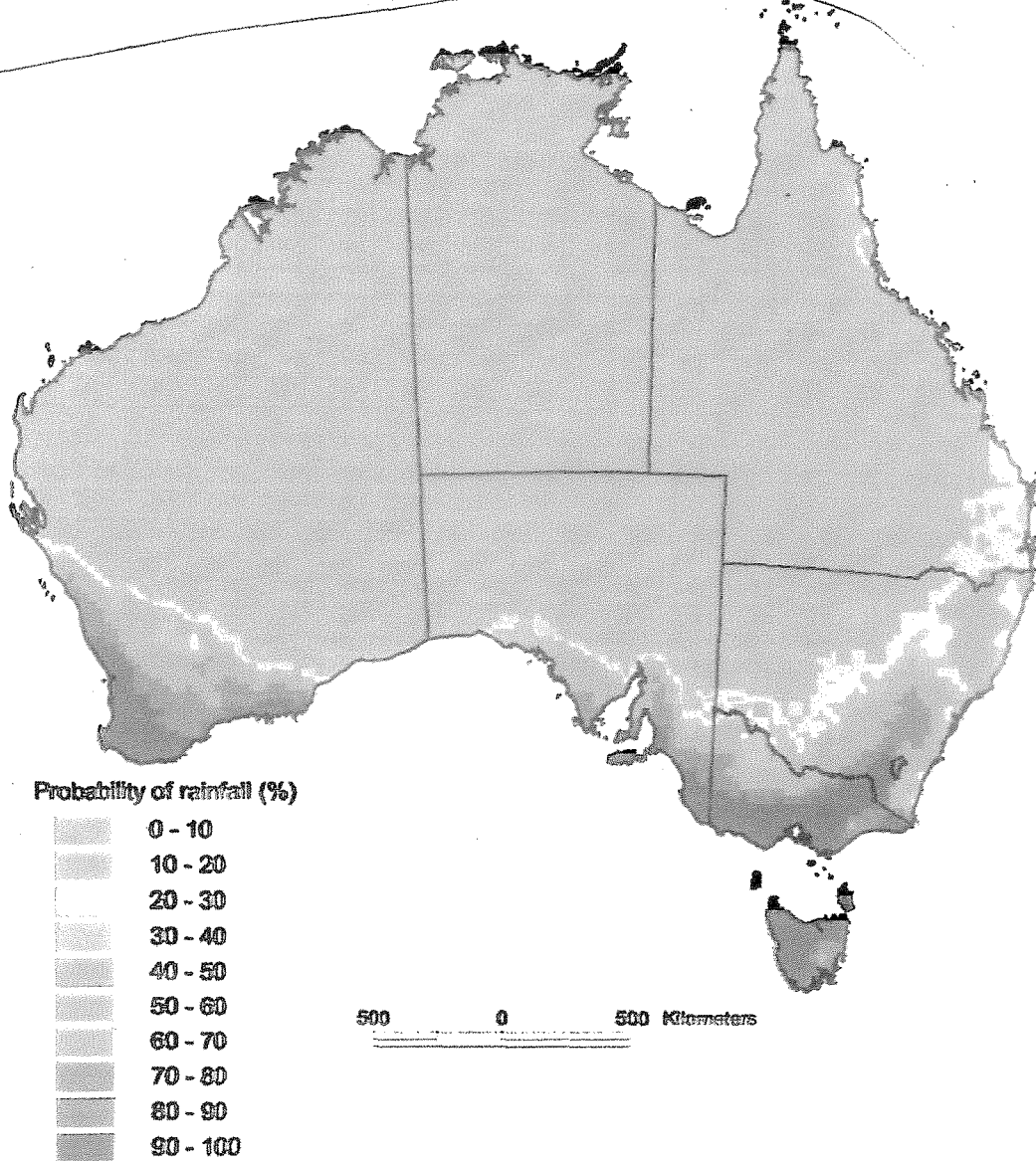
Raymond G. McComb January 2,2011

References :-

1. "1421 the year China discovered the World" Gavin Menzies
p 189 ref 27 Prof Wei Chu-Hsien " The Chinese discovery of
Australia " Hongkong 1961.
Toscanelli's Map of 1474
2. " The Drought walked through" A history of water shortage in
Victoria Jenny Keating 1992 Dept of Water Resources.

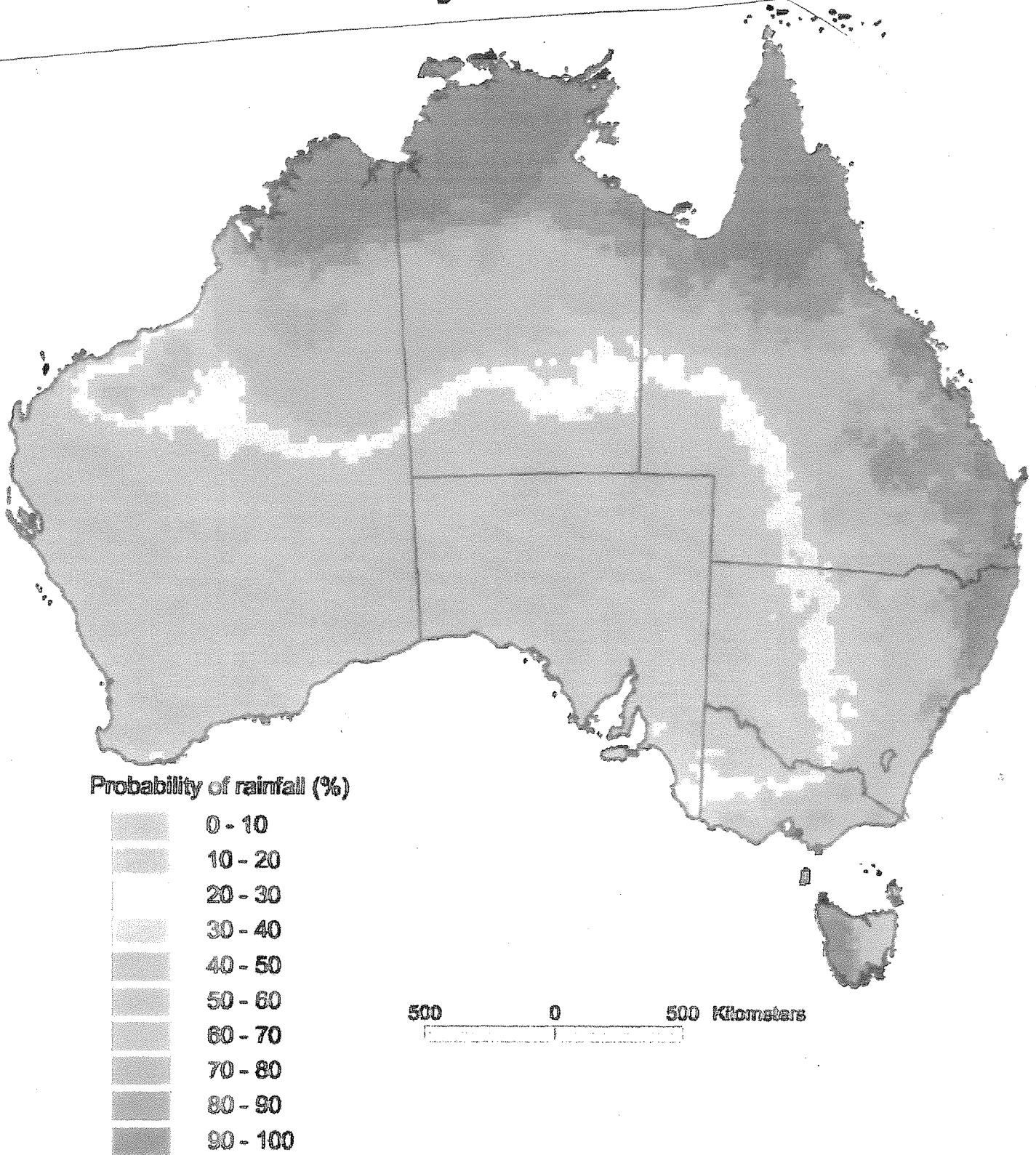
APPENDIX "A"

Reliability of Winter rainfall



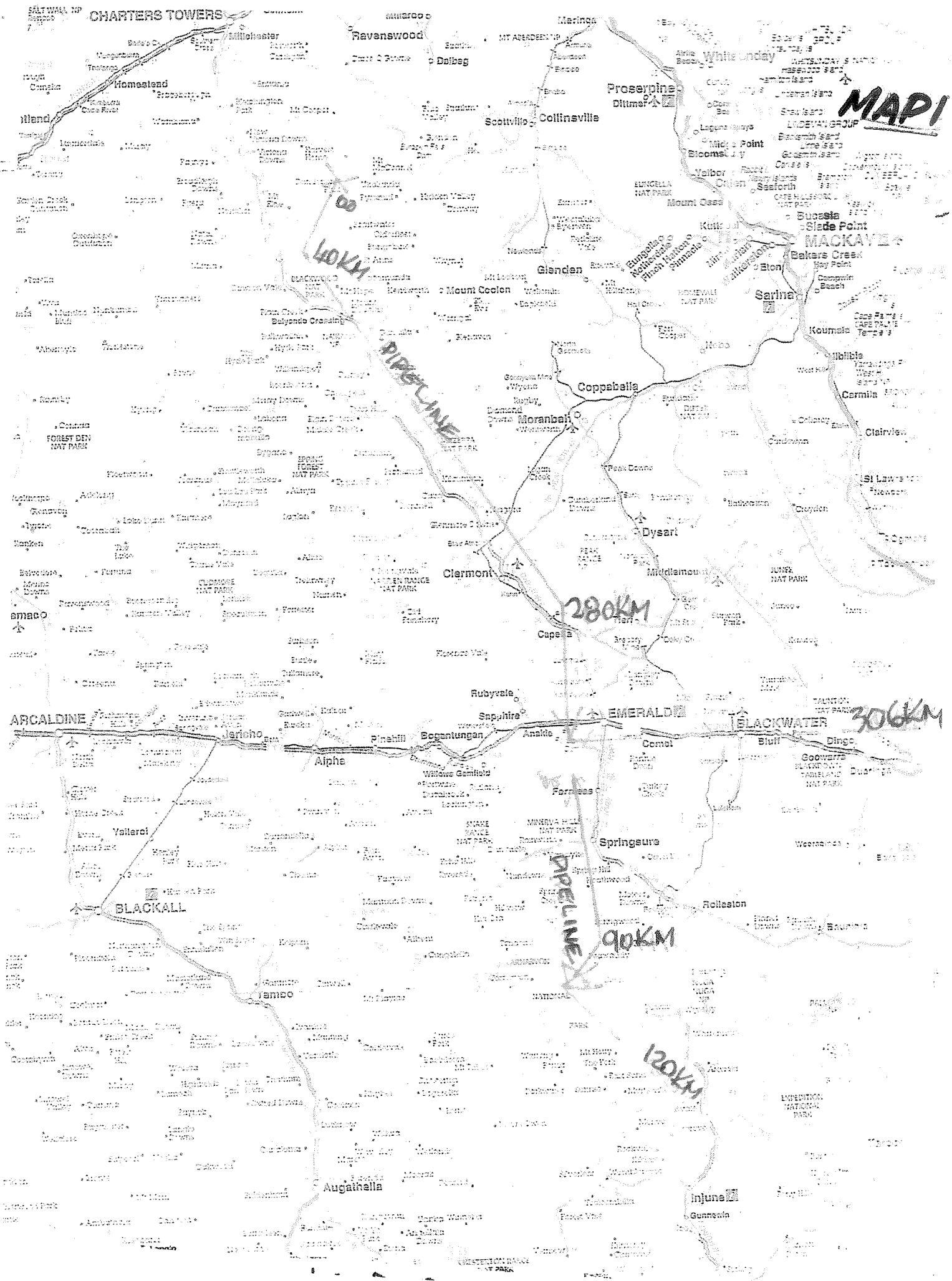
Chance of 20mm or more rainfall in each of June, July, August and September.
Analysis produced using BRS Rainfall Reliability Wizard, based on 100 years of rainfall
Bureau of Meteorology.
Analysis performed for the National Land and Water Resources Audit by the Bureau of
COPYRIGHT: Commonwealth of Australia (Aug. 2001).

Reliability of Summer rainfall "B"



Chance of 25mm or more rainfall in each of December, January and February.

Analysis produced using BRS Rainfall Reliability Wizard, based on 100 years of rainfall data.



MAP I

100KM

280KM

306KM

90KM

120KM

CHARTERS TOWERS

Homestead

Ravenswood

Proserpine

Whiteunday

Mackay

Glendon

Coppabella

Moranbah

ARCADINE

EMERALD

BLACKWATER

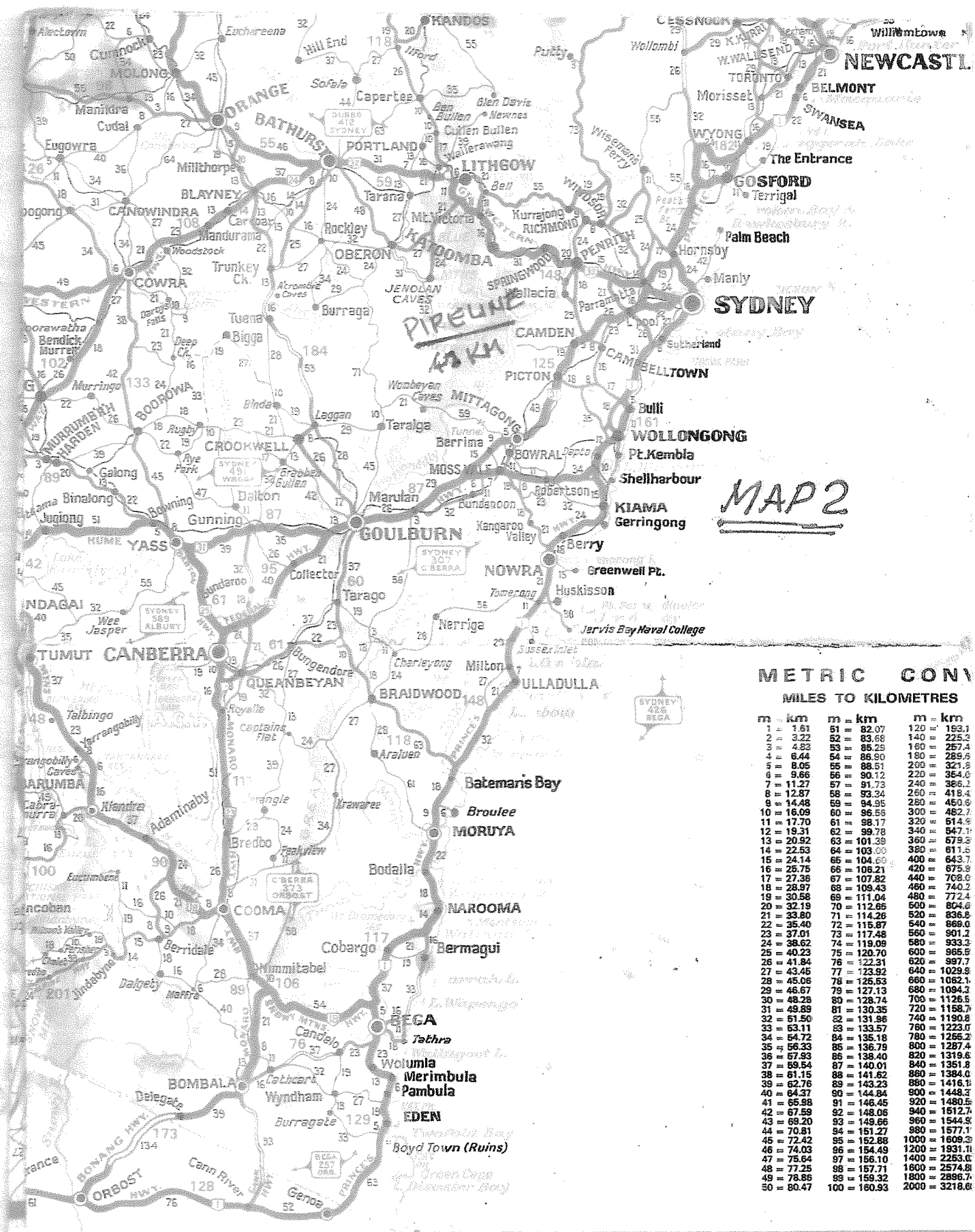
BLACKALL

Alpha

Springsure

Augathella

Injune



MAP 2

**METRIC CONV
MILES TO KILOMETRES**

m	km	m	km	m	km
1	1.61	51	82.07	120	193.1
2	3.22	52	83.68	140	225.3
3	4.83	53	85.29	160	257.4
4	6.44	54	86.90	180	289.5
5	8.05	55	88.51	200	321.6
6	9.66	56	90.12	220	353.7
7	11.27	57	91.73	240	385.8
8	12.87	58	93.34	260	417.9
9	14.48	59	94.95	280	450.0
10	16.09	60	96.56	300	482.1
11	17.70	61	98.17	320	514.2
12	19.31	62	99.78	340	546.3
13	20.92	63	101.39	360	578.4
14	22.53	64	103.00	380	610.5
15	24.14	65	104.61	400	642.6
16	25.75	66	106.22	420	674.7
17	27.36	67	107.83	440	706.8
18	28.97	68	109.44	460	738.9
19	30.58	69	111.05	480	771.0
20	32.19	70	112.66	500	803.1
21	33.80	71	114.27	520	835.2
22	35.41	72	115.88	540	867.3
23	37.02	73	117.49	560	899.4
24	38.63	74	119.10	580	931.5
25	40.24	75	120.71	600	963.6
26	41.85	76	122.32	620	995.7
27	43.46	77	123.93	640	1027.8
28	45.07	78	125.54	660	1059.9
29	46.68	79	127.15	680	1092.0
30	48.29	80	128.76	700	1124.1
31	49.90	81	130.37	720	1156.2
32	51.51	82	131.98	740	1188.3
33	53.12	83	133.59	760	1220.4
34	54.73	84	135.20	780	1252.5
35	56.34	85	136.81	800	1284.6
36	57.95	86	138.42	820	1316.7
37	59.56	87	140.03	840	1348.8
38	61.17	88	141.64	860	1380.9
39	62.78	89	143.25	880	1413.0
40	64.39	90	144.86	900	1445.1
41	66.00	91	146.47	920	1477.2
42	67.61	92	148.08	940	1509.3
43	69.22	93	149.69	960	1541.4
44	70.83	94	151.30	980	1573.5
45	72.44	95	152.91	1000	1605.6
46	74.05	96	154.52	1200	1931.1
47	75.66	97	156.13	1400	2256.6
48	77.27	98	157.74	1600	2582.1
49	78.88	99	159.35	1800	2907.6
50	80.49	100	160.96	2000	3233.1