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THE PARLIAMENT OF THE COMMONWEALTH OF AUSTRALIA

PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS

REPORT

relating to the proposed

AUGMENTATION OF TOWN WATER SUPPLY

at

Alice Springs, Northern Territory

(FOURTEENTH REPORT OF 1970)

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PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS

AUGMENTATION OF TOWN WATER SUPPLY
ALICE SPRINGS, NORTHERN TERRITORY

REPORT

On 29 July 1970, His Excellency the Governor-General in Council referred to the Parliamentary Standing Committee on Public Works for investigation and report to the Parliament, the proposal for augmentation of the town water supply at Alice Springs, Northern Territory.

The Committee have the honour to report as follows:

THE REFERENCE

1. The proposal referred to the Committee is for major works designed to augment the Alice Springs water supply and comprises

- bore pumping equipment, collection mains and a balancing tank;
- a delivery pumping station and power supply;
- a 7 million gallon ground storage reservoir; and
- a trunk main from the pumping station to the reservoir.

2. The work is estimated to cost $2.4 million.

THE COMMITTEE'S INVESTIGATION

3. The Committee received written submissions and drawings from the Northern Territory Administration and the Department of Works and took evidence from their representatives at a public hearing in Alice Springs. We also took evidence from representatives of the Alice Springs Agricultural Council,

the Alice Springs Water Committee, the Alice Springs Town Management Board, the Alice Springs Branch of the Australian Labour Party, Mr. B.F. Kilgariff, M.L.C., Mr. A.G.W. Greatorex, M.L.C. and a private witness.

4. An inspection was made of the existing water supply system.

EXISTING WATER SUPPLY AND RETICULATION

5. Alice Springs has a harsh arid climate with an average rainfall of less than 10 in. Such rainfall as there is, is variable and there is little or no surface water. The surrounding area is mainly semi-desert or desert and extremes of temperatures are experienced. Water supply for the town comes from bores in the Town Basin and the Mereenie Sandstone aquifer of the Amadeus Basin.

6. Town Basin The Town Basin underlies the Alice Springs township and until 1964 was the sole source of supply. Recharge of the basin comes from the beds of the Charles and Todd Rivers during spasmodic river flows.

7. Eight bores extract water from the Town Basin for the town water supply, it being pumped to the reservoir at Billy Goat Hill (300,000 gallons capacity) from where it is boosted to the Anzac Hill reservoir (450,000 gallons capacity) and then gravitates from both into the reticulation system. The Town Basin is also tapped in places by individuals using the water for domestic and agricultural purposes.

8. The basin has a limited capacity as an underground reservoir having an estimated safe yield of 150 million gallons per annum. Due to the high rate of extraction, rapid depletion of the storage occurs in periods of low recharge. In 1965, towards the end of a long drought period most bores suffered greatly reduced yields and some dried up completely.

9. To allow an equitable distribution of the available water between the competing demands, the town reticulation is now using 90 million gallons per annum, the remaining 60 million gallons thus being available through private bores.

10. Mereenie Aquifer This source, once used to supplement water from the Town Basin has now become the major source of supply. The bores through which the supply is derived are dispersed over an area some 8 miles south of Alice Springs. The bores are in the Mereenie Sandstone beds of the Amadeus Basin which is an extensive water bearing source in the area generally west of Alice Springs. The Committee were told that insufficient information is available at this point to gauge the extent of the source but conservative estimates suggest that the water available for pumping by shallow bores is 20 million acre feet.

11. Six bores just north of Roe Creek near the Stuart Highway deliver by collecting mains to a balancing tank and thence through a delivery pumping station for reticulation to the town through eight miles of 15 in. trunk main. Branch mains supply the airport and the Amoonguna Welfare Settlement. Water from the Mereenie bores is stored in the Annie Meyer Hill reservoir (1 million gallons capacity) on the eastern side of Alice Springs township and in the Anzac Hill reservoir. From these points, together with water pumped from the Town Basin into the Billy Goat Hill reservoir, the water gravitates into the town reticulation system.

12. One of the Mereenie bores has become unserviceable and is being replaced by another nearby. In addition, the pumps of another are being replaced and two new bores are about to be brought into production. When all of this work is completed, the Mereenie bores will have a potential output

of 25 million gallons per week (m.g.w.) plus a standby of 10 m.g.w. The delivery pumps from the field to the town are currently being augmented and their capacity will then become 22 m.g.w. which coincides with the capacity of the 15 in. trunk main. The total water available to the town will then be 24 m.g.w. including 2 m.g.w. from the Town Basin.

13. Two additional bores south of Roe Creek have been drilled, cased and pump tested and their connection and equipping form part of the work in this reference. Sites for a further three bores in the area have also been chosen for use when the need arises.

THE NEED FOR ADDITIONAL WATER SUPPLY

14. Population Growth The following figures illustrate the growth of Alice Springs' population in the past decade.

Year Ended 30 June	Population
1961 (Census)	4,648
1966 (Census)	6,390
1968 (Estimate)	7,810
1969 (Estimate)	8,785

15. Factors which have contributed to the population growth in this period in particular are tourism and the transport, building and cattle industries. Also relevant has been the establishment of the Joint Space Defence Research Facility. Except for the latter, it is fully expected that each of the other factors will ensure that the population of the town will continue to grow fairly rapidly for a lengthy period.

16. Although the population figures quoted indicate a growth rate of 11% compound since 1966, that same period saw the construction of the Space Research Facility and associated housing which boosted the figure in a manner

unlikely to be repeated. The Government's estimate of future population trends is that a rate of 8% to 10% will be maintained for the next five years and will taper off slightly after that. On this basis, it is expected that by 1975 the population will be not less than 14,000 and by 1980 at least 22,000.

17. Private witnesses were almost unanimous in the view that the predicted growth rate is conservative and that for the purpose of planning basic town services a rate of not less than 10% would be more realistic. Nevertheless, the Committee accept that it is reasonable at this stage to adopt the 8% to 10% basis particularly as after the completion of the work proposed in this reference, it will be possible for a considerable period to meet unexpected increases in demand by the relatively simple means of equipping additional bores and increasing pumping capacity.

18. Existing and Future Demand When the augmentation works currently being implemented are completed this financial year, the capacity of the water supply system will be 22 m.g.w. from the Mereenie aquifer and 2 m.g.w. from the Town Basin. Although the bores at Mereenie have a capacity of 25 m.g.w. plus a standby of 10 m.g.w. and it would be possible to obtain more water than this from the same source by the relatively simple expedient of drilling and equipping more bores, it cannot be delivered to Alice Springs because the capacities of the delivery pumping station and, more importantly, the trunk main are only 22 m.g.w. A further factor severely reducing the flexibility of the system is the capacity of the storage reservoirs in the town, which at only 1.75 million gallons, is considerably less than a day's supply during periods of peak demand.

19. The maximum quantity of water supplied in any one week was 16 million gallons in January 1970. However, this water was used at a time when water restrictions were in force and it has been estimated that if the demand had not been so limited about 19 million gallons would have been used.

20. The Committee were told that in determining the extent to which measures should be taken to augment the supply of water to Alice Springs consideration was given to the predicted population growth already mentioned and to the expectation that consumption of water per capita is expected to also increase. It was also relevant that the Amoonguna Aboriginal Settlement, the airport and the abattoirs are also connected to the supply. On these bases, it is thought that the weekly consumption will reach 25 million gallons in 1973, 30 million gallons in 1975 and be approaching 45 million gallons by 1980.

21. Should the peak demand estimate for 1972, which coincides with the capacity of the present system, be exceeded, restrictions will most certainly have to be imposed unless augmentation works are carried out. Furthermore, should a major mechanical breakdown occur during the period of peak demand, the situation would become critical because of the limited capacity of the three storage reservoirs.

22. It was therefore abundantly clear to the Committee that there is an urgent need for the augmentation of the water supply to Alice Springs.

SOURCES OF WATER SUPPLY

23. Town Basin Water from this source so far has been pollution-free but as the basin underlies the town, the growth of Alice Springs increases the contamination risk. However, as the supply has proved to be strictly limited and now provides only 8% of the system's capacity, it is planned to phase it out when the work proposed in this reference is completed. Further water will then be available from the basin for agricultural and other uses.

24. Surface Storage of Water The submission of the Northern Territory Administration discussed the possibility of providing water for Alice Springs by means of a dam on the Todd River. It pointed out that compared with the proposal to draw water from the Mereenie aquifer a surface storage would be more costly, a problem to maintain because of siltation, unreliable due to high evaporation and uncertain rainfall and would not provide the quantity of water required either in the short or long term.

25. A private witness opposed this point of view and submitted that a dam could also be a means of providing Alice Springs with a water feature for recreation and sporting pursuits. The desirability of a surface water storage for the latter purposes was supported by other witnesses.

26. As the prime concern of the work in this reference is the provision of an assured and reliable water supply to Alice Springs, we were not convinced that the construction of a surface storage was a satisfactory means of achieving this aim.

27. Mereenie Aquifer The Committee were told that experience with the Mereenie aquifer as a supply source since 1964 had been most satisfactory and it has proved to be reliable. We noted that the aquifer is known to be extensive but its limits have not been determined and although its full potential has not been ascertained, investigations suggest that the water reserves should be ample for a large increase in draw off. The water is of good quality being softer and lower in total dissolved salts than that from the Town Basin.

28. In the present circumstances, the continued use of water from the Mereenie aquifer is undoubtedly the most satisfactory means of maintaining and augmenting a water supply to Alice Springs. There is every reason to think

that the supply is ample for the requirements, is reliable and is, furthermore, economical to obtain and reticulate. However, it was apparent to the Committee that with almost complete dependence on the Mereenie aquifer for present and future supplies of water, it is imperative that investigations be continued to establish its potential.

WATER FOR AGRICULTURAL USE

29. Water for agricultural use is drawn from the Town, Inner Farm and Outer Farm Basins. The Town and Inner Farm Basins are actually one and the same being connected by a narrow neck at Heavitree Gap. The Outer Farm Basin lies further to the south. There are four farms overlying the Inner Farm and 12 overlying the Outer Farm Basins.

30. As mentioned in paragraph 23, on completion of the work proposed in this reference, use of the Town Basin for the town supply will be discontinued thus adding to the supply available for agricultural use. However, to overcome the problem of the limited and at times unreliable supply, studies are being made of the possible use of the Mereenie aquifer for a farm group scheme located away from the town supply source to avoid competing demands.

THE PROPOSAL

31. The work proposed, combined with further bores and pumps as required, is expected to cater for the demand up to about 1980. At that time, an additional storage reservoir in the township will be necessary. On completion of the present work in 1972, the use of the Town Basin as a supply source will be discontinued. The output potential, all from the Mereenie Basin, will then be 38 m.g.w. with a standby of about 26 m.g.w., which on current growth rates will be sufficient to about 1978.

32. Bores Two bores, of 13 in. diameter and 10 in. diameter respectively, have been sunk already in the area west of Roe Creek and a third is to be sunk. These bores are to be equipped to provide a total capacity of 24 m.g.w. However, to allow for possible mechanical and other faults in the system, for supply planning purposes they are regarded as having only a firm available capacity of 16 m.g.w. Future bores, to be added as consumption rises are planned to be of 15 in. diameter each producing 8 m.g.w.

33. Collection Mains The bores will deliver by collection mains to a balancing storage tank and pumping station appropriately located to suit bore development. The mains will be installed progressively as required.

34. Delivery Pumping Station The pumping station will be initially equipped for a total pumping capacity of 24 m.g.w. with a firm capacity of 16 m.g.w. to match the bore output. The power supply to the station will be extended as necessary.

35. Trunk Mains A trunk main 9 to 10 miles in length will be laid to the town from the pumping station. The latter half of the route will follow the existing 15 in. main. The Committee were told that an economic study of different sized mains demonstrated the obvious advantage in sizing this main for the estimated 1990 requirement and accordingly a 30 in. diameter main is proposed.

36. Reservoir A reservoir to augment existing storages in the town and to balance out daily fluctuation during periods of peak demand as well as hourly variations on peak days will be constructed on the western edge of the town. A site has been chosen for this tank in a fold in the hills so that its silhouette will not break the skyline. The reservoir will have a capacity of 7 million gallons and it is thought will meet storage requirements up to 1980.

37. Distribution Main A distribution main from the proposed reservoir will be laid to the northern part of the town to improve the supply in that area.

38. Water Treatment The Committee were told that it is planned to instal both fluoridation and chlorination plant for treatment of the water supply and that this work has been programmed separately.

39. Committee's Conclusion The Committee recommend the construction of the work in this reference.

ESTIMATE OF COST

40. The estimated cost of the work when referred to the Committee was $2.4 million made up as follows:

	$
Equipping bores, collecting mains and balancing tank, pumping station, deliery pumps, electricity supply	365,000
Trunk main	1,400,000
Storage reservoir, distribution main and disconnection of Town Basin	635,000
	2,400,000

PROGRAMME

41. We noted that subject to an early approval to proceed being given, tenders can be called for the pumping station, electricity supply, the trunk main and the storage reservoir in January 1971. The balance of the work except for the disconnection of the Town Basin supply, is to go to tender in March 1971.

42. Except for the disconnection of the Town Basin supply, which is not critical, the remaining work is to be completed progressively between August 1971 and November 1972. The last component to be finished is the trunk main, which at that time will be the only impediment to the system meeting the peak demand of the 1972/73 summer.

43. As the completion of the trunk main is so critical and the construction programme does not allow for unscheduled delays in this phase of the work, we believe that the target date for the completion of this work should be advanced to September 1972. By this means, we would hope that the supply will be assured and restrictions in 1972/73 will not be necessary.

RECOMMENDATIONS AND CONCLUSIONS

44. The summary of recommendations and conclusions of the Committee is set out below. Alongside each is shown the paragraph in the report to which it refers.

		Paragraph
1.	THERE IS AN URGENT NEED FOR THE AUGMENTATION OF THE WATER SUPPLY TO ALICE SPRINGS.	22
2.	THE CONTINUED USE OF WATER FROM THE MEREENIE AQUIFER IS UNDOUBTEDLY THE MOST SATISFACTORY MEANS OF MAINTAINING AND AUGMENTING A WATER SUPPLY TO ALICE SPRINGS.	28
3.	THE COMMITTEE RECOMMEND THE CONSTRUCTION OF THE WORK IN THIS REFERENCE.	39

		Paragraph
4.	THE ESTIMATED COST OF THE WORK WHEN REFERRED TO THE COMMITTEE WAS $2.4 MILLION.	40
5.	THE TARGET DATE FOR THE COMPLETION OF THE TRUNK MAIN SHOULD BE ADVANCED TO SEPTEMBER 1972.	43

(C.R. KELLY)
Chairman

Parliamentary Standing Committee on Public Works,
Parliament House,
CANBERRA, A.C.T.

1 September 1970.