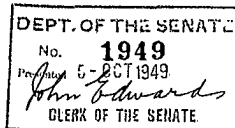


THE PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS.



R E P O R T

relating to the

proposed construction of a

S E W E R A G E I N S T A L L A T I O N

at

A L I C E S P R I N G S

N O R T H E R N T E R R I T O R Y .

For Senator Lamp -

I bring up the Reports of the
Parliamentary Standing Committee on Public Works,
relating to the following works :-

Proposed construction of a Sewerage Installation
at Alice Springs, Northern Territory.

Proposed erection of a Hostel for Officers at
Darwin, Northern Territory.

Proposed erection of a Primary School at
Darwin, Northern Territory.

Proposed erection of a Wool Biology Laboratory at
Prospect, New South Wales.

Proposed erection of an Automatic Telephone Exchange
at St. Kilda, Victoria.

5th October, 1949.

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THE PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS.

ALICE SPRINGS SEWERAGE INSTALLATION.

R E P O R T.

The Parliamentary Standing Committee on Public Works, to which the House of Representatives referred for investigation and report the question of the proposed sewerage installation at Alice Springs, Northern Territory, has the honour to report as follows :-

S E C T I O N I.

I N T R O D U C T O R Y.

HISTORICAL.

1. For many years Alice Springs has been an important town in the Northern Territory, owing both to its position at the railhead and to its location in connection with the rich cattle raising country which surrounds it. An abundant supply of fresh water, contained in the large sand basin under the town, also makes the town specially attractive in the country where vast areas of land support life on a very meagre water supply.

2. The curious formation of hills, through which the Todd River occasionally flows by way of the picturesque Heavitree Gap, and the fact that through the years the town has sprung up and developed right over the extensive sand beds which yield the fresh water supply, are the basic reasons prompting the necessity for a sewerage system.

3. During the war, when the population of Alice Springs increased by many thousands with the influx of troops to the locality, the possibility of pollution of the water supply, by the discharge of effluent from heavily loaded septic tanks, came under notice. The supply of water for the town was taken from a number of wells, many of which were privately owned.

4. In 1942, Mr. Hodgson of the Engineering, Water Supply Department of South Australia, who is recognised as an authority on sewage treatment, was asked by the Allied Works Council to report on the wastes from the hospital, keeping in mind the ultimate sewerage of the town. In his report, Mr. Hodgson emphasised the danger of pollution of the water bearing sand beds, both from septic tank effluent and sillage water, and proposed a full sewerage system as the ultimate solution.

5. Subsequently, owing to changed conditions, it was decided to defer action until after the war, when the matter could be considered from the more normal conditions operating after troops had been withdrawn from the area.

6. In 1945, Mr. MacKenzie, Engineer of the Allied Works Council, reported on the proposals, recommending the ultimate discontinuance of private septic tanks. He also recommended chlorination of water supplies and the extension of the water system to prevent the indiscriminate use of well water. The system was accordingly extended and the water therefrom chlorinated for use in the town. This system is at present in use, but the possibility of pollution is always present because the sullage water from the town and effluent from a number of septic tanks are discharged into the ground over the water bearing beds which extend under most of the town.

SECTION II.

THE PRESENT PROPOSAL.

THE FULL SEWERAGE SCHEME.

7. The scheme proposed provides for the sewerage of the three main areas forming the town. The first zone includes the township proper on the west bank of the Todd River; the second includes the existing settlement on the eastern side of the river and the planned extension of the town to the north-east; and the third area extends between the railway and the river, from near the hospital to Heavitree Gap.

8. The central area will be served by gravitation sewers of 6 inch, 9 inch and 12 inch diameter, and sewage will gravitate to a point on the highway near the hospital. Sewage from the eastern area will be collected at a low level pumping station and pumped into the main sewer. The southern area will be connected to the main sewer, which will continue along the highway to its lowest point, where a pumping station will be placed so that the sewage may be pumped from there through a cast iron rising main passing through Heavitree Gap to treatment works south of the Gap.

9. Sewage is to be passed through Imhoff tanks where digestion of the solids will take place. The effluent from these tanks is to be passed through trickling filters, after which humus tanks will remove a further portion of the suspended solids. The effluent would then be ready for discharge onto the land south of the rock bar at Heavitree Gap so that there would be no possibility of flow back to the water bearing sands under the town.

ESTIMATED COST.

10. The estimated cost of the work, including sewers, pumping stations and treatment works, but not including the house connections and house fittings, which are normally regarded as expenses which the owner of the house should meet, is set down at £115,000. The approximate cost of the house connections may be taken as £20,000, and the cost of house fittings for the whole township £18,000. The estimated annual charges are £7,300, representing approximately £4 per year per person of the population taken at slightly over 1,800.

SECTION III.

THE COMMITTEE'S INVESTIGATIONS.

GENERAL.

11. The Committee studied the plans, and took evidence from the Director of Engineering in explanation of the details provided for in planning the sewerage scheme. Whilst en route to Darwin the Committee stayed at Alice Springs to visit the site of the proposed sewerage installation and to gather evidence from officials and local inhabitants likely to be of use in making decisions concerning the project. A considerable amount of the detailed evidence taken in regard to the Alice Springs School project was also of use in informing the Committee regarding the requirements of the town and the general conditions which make the present proposal necessary. Inquiries were also made with a view to finding some alternative system which would not be so costly for such a town of comparatively small population.

NEED FOR A SEWERAGE SYSTEM.

12. The Committee visited Alice Springs at a time when the climate was at its best, but, nevertheless one of the impressions quickly forced upon the Members was the prevalence of large numbers of flies. Wherever the Committee went they were worried by this nuisance, and were able to understand the opinions of various witnesses who stressed the danger from flies in an unsewered town, in the trying weather experienced over a considerable portion of the year in those northern areas.

THE WATER SUPPLY.

13. Another factor which is of the greatest importance in this town is the possibility of pollution of the water supply from septic tanks and sullage water. Alice Springs is situated in a most striking setting, and is peculiarly located so far as its water supply is concerned.

14. The town nestles in an angle formed by two low ranges of hills which are separated only by the well-known Heavitree Gap. The Gap stands out clearly from any point of vantage in the surrounding country, and is a landmark easily recognisable when approaching by air. The Todd River, on which the town is situated, flows through the Gap on the occasions when floods bring down sufficient water to make it run, but, for most of the year the bed of the river is dry and sandy.

15. Extensive deep sand beds exist under practically the whole of the town, and they contain water which is accessible by sinking wells a few feet deep. In the past household water has been drawn from wells sunk in private properties, where drainage and sullage had been run into the ground or into pits nearby. Although no trouble was noticed from this practice while the population of the town was small, the position began to cause some alarm during the war, when large detachments of the fighting forces came to Alice Springs and the whole of the water from the ablution benches ran into the sullage pits. Weekly tests of the water at that period showed that the bacterial content of the water had changed, assuming serious proportions, and as soon as the Army Authorities realised what was happening, they arranged that the whole of the sullage should be chlorinated before going into the

ground. The added precaution was also taken of chlorinating the whole of the water used on the surface.

16. As the demand for town water increased it became necessary to provide a general water system for Alice Springs, and wells were sunk from which pumps were able to supply all the water necessary. The Committee was informed that the area of the water basin has been surveyed, and it comprises about 2½ square miles, providing a sufficient volume of water to cope with all the foreseeable needs of Alice Springs township in the future. The supply results from the unusual formation of the ground, and there is no other basin of water similar to the Alice Springs basin in any other locality in this area, though it is possible by going down 25 feet to get water as salt as the sea. Although as much as 1,000,000 gallons of water per day was pumped out at one period there has never been any material decrease in the flow of water, and a level balance has been maintained at all times.

17. It was stated that, in normal times there is a complete washing of the basin every time the river runs, and, as the whole of the town water comes into the basin, it is effectively cleansed. However, it is realized that, if a dry spell of three or four years were experienced, and some bacteria appeared in the water basin, very serious results would be likely.

18. Since the war the town water supply has been drawn from two wells and pumped into storage tanks for reticulation through the supply pipes. Regular bacteria counts are still made by the Department, and the Committee was informed that the tests are negative. However, chlorination of the town water supply is still maintained as a precaution.

19. It appears, from evidence received by the Committee, that some water is still being used by private persons from wells on their property, while sullage water is being run into the ground. One hotel proprietor is experiencing difficulty in disposing of ^{waste} the/water from his establishment, and it has been necessary for him to sink seven pits to a depth of 18 feet, being within four feet of the underground water supply, but waste water from the bathrooms will not soak away into the ground. The pits become

silted up on the sides with soap residue, and it is necessary to empty them twice a week by pumping the waste with electric pumps into tanks and carry it away on motor lorries. It is claimed that this system of disposing of sullage is dangerous and unhealthy, and it is an important reason for advocating the installation of a complete sewerage system for the town.

THE PRESENT SANITARY SYSTEM.

20. At the present time there is a pan system operating in Alice Springs, the number of sanitary services at 30th April, 1949, being 589, and the number of premises served 511. In addition there are about 27 septic tanks in the town, including those installed in the two hotels, private homes and public buildings.

21. The cost of the bi-weekly garbage and sanitary service has been fixed at £6-10-8 per annum, and £5-4-8 per annum for garbage clearances. The sanitary service is carried out by contract, and natives are used almost exclusively in connection with the work. It has been submitted that the pan system of sanitary service is not satisfactory or healthy in a town the size of Alice Springs, while the climate and the presence of myriads of flies add to the danger, nor is the septic tank system suitable in such proximity to the water supply.

22. The Committee is therefore convinced that some alternative to the present sanitary system is necessary in Alice Springs.

ALTERNATIVE METHODS.

23. The Committee was informed of alternative schemes for treatment which had been examined in connection with the needs of the town. The cost of sewerage the township would be high and the alternative methods available would consist of individual or group septic tanks, or, the provision of chemical closets.

THE SEPTIC TANK SYSTEMS.

24. Although the cost of group septic tanks and for individual septic tanks would cost a good deal less than a full sewerage system, it has already been shown, in the section dealing with the water supply, that the peculiar circumstances in Alice Springs make the septic tank system highly undesirable, the benefits

which would be evident in an ordinary country town being outweighed by the danger of pollution of the town water supply.

CHEMICAL CLOSETS.

25. In regard to the possibility of using chemical closets as an alternative to the costly sewerage scheme it was stated that chemical closets are much better than the ordinary type, and, so far as public health is concerned, they would meet the requirements of the town, provided that they were regularly inspected, efficiently maintained and properly controlled. However, it was explained that, even with them there is some unpleasantness, and there is a discharge of caustic into the ground which affects the soil to some extent. It was also pointed out that, from recent investigations overseas, there may be some danger with water of a high nitrate content, and this point would need further consideration where chemical effluent entered the water basin. There is also an element of danger with this system owing to the prevalence of flies, and a certain amount of dissatisfaction with this method exists in some quarters. It is claimed that there is no such danger if the system is properly controlled and maintained, but there is no certainty that this could be assured in Alice Springs where there is a large percentage of half caste people living in sub-standard conditions.

ESTIMATED COST. The Full Sewerage System.

26. The estimated cost of installing the full sewerage system, for the whole township on both sides of the river, is £153,000. This is made up of £115,000 for the sewers, pumping stations and treatment works; connection to houses £20,000; and house fittings for all the houses £18,000, though the figures for house connections and fittings can only be regarded as approximate until accurate details are available of the actual positions for the points to be provided in each individual home.

27. The amount estimated appeared to be excessive in comparison with that for a country township of similar size, and the Committee considered the reasons advanced for the high costs.

It was explained that the allotments in the township are large and settlement in the outlying portions is scattered, while the estimate provides for sewerage of a number of allotments not yet occupied. In addition, because of the flat nature of the country, many of the trenches would have to be deep and excavation would be costly, while some trenches would have to be timbered during construction. It was also calculated that the general cost of construction in Alice Springs is 65 per cent higher than in Adelaide, and a recent estimate for sewerage of a town with a population of approximately 2,600 in the west of New South Wales was £100,000. It seems likely, therefore, that the estimate prepared by the Department of Works and Housing is as accurate as it is possible to calculate in these times.

The Septic Tanks and Chemical Closets.

28. In comparison with the full sewerage system, including pumping and sewerage treatment works at some distance beyond Heavyside Gap, the installation of septic tanks or chemical closets appears much less costly. For group septic tanks the cost is estimated at £94,000, and for individual septic tanks £77,000, while chemical closets would cost approximately £11,000.

FUTURE PROSPECTS.

29. One of the factors which the Committee had to consider, in deciding on the desirability of recommending such a costly scheme for a country township, was the possibility of future growth of the population of the town and the probable increase in importance of the locality and surrounding country. As the railhead and the centre of rich cattle country Alice Springs occupies an important position, and evidence submitted to the Committee shows that the view is strongly held of the continued importance of the town and solid growth as time goes on. Even if the railway is extended north and the town is no longer the railhead, its importance is likely to continue as a centre for despatch of cattle, as a rail depot, a main focus for widespread schooling activities, and the centre of a mining area carrying a variety of important minerals. It is also thought that its geographical position, half way between Adelaide and Darwin, and its excellent water supply will always contribute to its stability in the future.

30. The Committee was informed of building activity and other factors indicating an increase in the population of the town, and the general impression gained was one of a progressive, orderly township with a promising future. After considering all the factors, studying the plans, weighing the evidence before it, and comparing the possibilities of the less costly alternatives available, the Committee decided that it is advisable to instal a full sewerage system for Alice Springs.

LEAKAGE FROM PIPES.

31. One of the points which caused the Committee some concern was the fact that no guarantee can be given that the sewer pipes will be absolutely free from leakage, and, so long as this possibility exists there will be a potential danger of pollution of the town water supply, in spite of the installation of the expensive sewerage system. It was explained that normally sewerage pipes are rendered on the inside to prevent seepage, in which case the only way that seepage can occur is as a result of breaks or bad jointing. The chance of breakage was stated to be remote, but unless special care is taken in the construction work seepage may easily occur at the joints. The ordinary sewer pipe is a stoneware pipe with a "compo" joint of cement and sand that is pushed into the joints. It is difficult to make these joints carefully at the bottom of a deep trench, and, if the workmanship suffers, there will be leakage at the bottom when the line is in use. However, it is possible to use concrete pipes with rubber ring joints, and this method is stated to be almost completely effective against leakage, but these are believed to be in short supply.

32. If leakage did occur from the joints the sand would act as a natural filter to protect the water supply from contamination by bacteria, and the greatest risk would be at points where the sewer pipes had to be laid at a depth which brought them very near to the water supply level. The drop in level from the top of the town is about 34 feet, and the point at which the pipes will be nearest the water will be in the lower part of the town, below the level of the intake wells for the town water supply.

In addition the whole of the water in the basin is moving towards Heavitree Gap, away from the town, and, with reasonable workmanship on the project the risk of pollution is not regarded as very great.

33. In order to ensure that the installation will be safe and efficient when it is completed, and, in view of the peculiar conditions in which this town is situated, the Committee recommends that special supervision should be given to the selection and laying of the pipes, and that the work shall not be proceeded with until suitable concrete pipes and rubber joints are available for the work.

MATERIALS AND LABOUR.

34. In outlying country towns there is generally considerable difficulty in securing materials and labour for large construction works, and in this case, with the exception of some local unskilled labour, supplies would have to be brought from Adelaide. The Committee was informed that there is a considerable shortage of labour and materials in Adelaide, but certain firms of builders and architects desire to carry out work in Alice Springs if a sufficient volume is available to warrant the establishment of the necessary organisation. The Committee therefore, viewing this project in conjunction with the proposed Alice Springs School and other building activity in the town, is of opinion that the work should be proceeded with at a time when it can be linked with other construction proposals of an urgent character in the town.

REVENUE.

35. In planning a sewerage installation there are certain items to be considered in connection with maintenance and operating charges, as well as the possibility of the amounts to be paid by residents for the installation of the service, while a certain amount of revenue can be obtained from the use of the effluent from the treatment works.

36. In country towns in Victoria it is found that sewerage can be financed by the inhabitants under the Government scheme which makes a proportional grant according to the population of the town and advances the remainder of the cost at 5 per cent interest.

However, it is realized that, for an installation as costly as the one under consideration, it would not be possible to recoup the expenditure in such a manner. It was also pointed out that in Alice Springs, where a considerable proportion of the population is half-caste, the Government would have to shoulder most of the cost. A great deal of interest was taken in the project by the local inhabitants who are stated to be prepared to pay a reasonable amount for the service.

37. The Committee was informed that it has been decided to charge the residents £6-10-8 per annum for the cost of the present sanitary service, and residents would no doubt expect to pay something in addition to this for a full sewerage system. When the installation is completed, and details are available of the actual number of points to be serviced, it will be possible to determine what is a reasonable charge to residents for installation and maintenance charges, with a provision for the installation portion to be paid over a number of years.

38. From the treatment works outside Heavitree Gap there would be a considerable flow of effluent available for use on the land, and, it was pointed out, that in an area with a climate such as that at Alice Springs, the effluent should not be wasted. It is estimated that about 50,000 gallons per day will be discharged from the treatment works, and it is desirable to use it for irrigation or the production of some kind of vegetation. The rights for the use of this water could be sold by the Administration with the lease of the land on which it would be used, and, in this way additional revenue could be obtained to offset the cost of operating the sewerage installation.

ALTERNATIVE SITE.

39. There was a suggestion at one stage that, to save the expense of carrying the sewerage scheme through Heavitree Gap to the treatment works beyond it, a site for the treatment works near the present golf links should be used. However, it was realized that this site was within the area under which the water basin extended, and the risk of pollution of the water would be almost as great as at present, and no further steps were taken to develop this plan.

CHLORINATION.

40. The practice of chlorinating the water before use in the town became necessary when the influx of troops brought the risk of contamination to serious proportions, and it has been considered advisable to continue this treatment up to the present time, even though the danger is said to have almost disappeared. The Committee was also informed that, in the opinion of the officials concerned in the planning of the installation, the chlorination of the town water supply should still be continued if the full sewerage system is installed. The Committee fully agrees with this view, and it feels that, while the water supply is drawn from the sand beds under the town, and an element of danger exists, the added precaution of chlorination and regular testing of the water are essential in the interests of public health.

41. It also appears that, so long as residents with private wells for water and sullage pits for waste are allowed to use them, there will always remain a source of risk which has not been adequately dealt with. It is therefore considered desirable that, when the full sewerage system is established, steps should be taken to effectively prevent the further use of private wells and sullage pits, by suitable regulations and efficient inspections.

SECTION IV.

THE COMMITTEE'S RECOMMENDATIONS.

SUMMARY OF DECISIONS.

42. The following is a summary of the recommendations made by the Committee :-

	Paragraph in Report.
(1) Some alternative to the present pan system is necessary.	22
(2) It is advisable to instal a full sewerage system.	30
(3) Special supervision in selection and laying of pipes is essential.	33
(4) The work should be preceded with when concrete pipes and rubber joints are available.	33
(5) The project should be linked with other urgent proposals to obtain the benefit of building organisation.	34

Paragraph
in Report.

- (6) The Committee agrees that the water should still be chlorinated and regularly tested. 40
- (7) Steps should be taken to prevent the use of private wells and sillage pits after the sewerage system is installed. 41
- (8) In view of the special conditions in Alice Springs special consideration should be given to making the charge to residents as light as possible. 37.

CHARLES A. LAMP
CHAIRMAN.

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CANBERRA. A.C.T.

3rd September, 1949.