

Portfolio Communications and Works

WATER AND SEWERAGE PROJECT OFFICE

1982 ANNUAL REPORT

1. General
2. In-house Approach
3. Phasing of Development
4. Project Developments
5. Expenditure 1982
6. Funding
7. Future Revenue
8. Appendix Drawings
 - 8.1 Sewerage Phasing
 - 8.2 Water Supply Phasing
 - 8.3 Lower Valley Wellfield
Development - Site Plan

21st January 1983.

Water & Sewerage Project Office

1982 Annual Report

1. General

During 1982 it was agreed that the Project should adopt the following approach and Policy.

- 1.1 Wherever possible all work to be achieved on an in-house basis, minimising use of consultants and maximising use of local resources.
- 1.2 Establish an office and design structure that is capable of producing the gradual evolution of a public water supply and sewerage system.
- 1.3 Produce legislation that is capable of establishing a Water Authority, the terms of reference of which will protect ground water resources and provide public water and sewerage systems.
- 1.4 To accept the United Nations offer of assistance, within its Smaller Islands Water Resources Project, and ensure that maximum benefit is obtained from this aid.
- 1.5 To work within the Water & Sewerage Policy defined by Government and to assess problems of providing services to the priority areas stated in that policy and where feasible to provide services to these areas.
- 1.6 To opt for ground water development as the long term solution to the public water supply. This followed a full cost comparison of desalination and groundwater development.

2. 'In-house Approach'

- 2.1 The unique water supply situation in the Cayman Islands caused by development occurring without the provision of a public water supply, where individuals provide for their own water supply, results in a supply that is inadequate, in terms of quantity, and quality. The task of determining the additional water requirement of existing development, provided by a public supply is largely a matter of educated guess work. The lack of definite information on future development also compounds this problem. It was therefore decided to progress with the implementation of a water supply gradually, addressing the major problems and developing from this base. (See section 3 for phasing of this part of the Project). This would appear wiser than expending large amounts of capital on an island wide scheme without guaranteed sales of water. An in-house approach is appropriate to satisfy a gradual development.
- 2.2 The same approach is to be adopted for the sewerage side, except that individual projects will be more complex and may involve the use of specialized consultative work.

3. Phasing of Development

3.1 Water Supply

3.1.1. Lower Valley Wellfield Development - This is the first phase and involves the development of the Lower Valley lens to provide 100,000 galls/day. Initially this water will be stored in a 200,000 gallon reservoir, treated and distributed to the water truckers. This development is designed so as to be incorporated in the future island wide system.

3.1.2. East End Wellfield Development and Distribution System -

A scheme to supply 60,000 galls/day through a distribution system to the residents of the Eastern District is the second phase of the Project providing a supply to an area that receives less rain-fall than the rest of the island, causing less efficient rain water catchment and where ground water is of suspect quantity and quality. It will also satisfy what could be a political problem of taking water from the Eastern lens to supply the West.

The well field will be designed so as to be readily accepted into a large scale development to provide for the island wide system.

3.1.3. Northside Wellfield Development and Distribution System

This scheme will be the third phase of the Project and carried out for the same reasons as 3.1.2. and will also be designed to be incorporated into the island wide system.

3.1.4 Islandwide Water Distribution System - The previous three phases of the water supply project will provide an indication of how the ground water resources react under development, how well accepted a public water supply is by the general public and will also be providing some income for the Authority.

The fourth and final phase will be to further develop the Eastern and Northside lenses to their full capacity and provide a main pipeline to the Western Pennisular, taking in the Lower Valley development on route. It is anticipated that a total quantity of one million gallons/day will be available and will be distributed to the main areas of Bodden Town, Savannah, George Town and West Bay. This quantity of water would supply 20,000 persons with 50 galls/day. It is anticipated that residents of these islands will continue to maintain part of their individual supplies, therefore it is estimated that a population of 35-40,000 could be served.

3.1.5. Time Frame - The Lower Valley Project is now underway, the design has been completed, land negotiations are almost complete, materials are being purchased and construction is expected to commence 1st February 1983. The scheme should be complete within two months in time to supplement the dry season demand.

Design of the East End Well field has commenced and will be completed shortly, the distribution system design will then be finalized. Once approval has been given it is anticipated work on this phase will commence in June, and be completed in October.

The Northside phase will commence on completion of the East End phase with an anticipated starting date of December 1983, completion April/May 1984.

The islandwide scheme is not yet projected as it will depend on results from the first three phases, but the flexibility of the approach would allow for implementation earlier should demand dictate. In any event the first three schemes will form part of the overall Project and are not tangential developments.

3.2 Sewerage

3.2.1. West Bay Road, South of Governors Harbour and Central George Town

This is considered the priority area and ground work on providing a service in this area has commenced. The Sewerage Engineer, recently appointed, is drawing up basic design parameters in terms of type of treatment and collection works. The best location for the works has been agreed and investigations into site procurement are under way. The attached plan indicate the most economic position for the works, taking into account the second proposed phase of development.

The treatment works proposed being sewage stabilization ponds, the advantages are ease of construction, low technology, ability to function with little attention, low capital investment, apart from land purchase, and flexibility.

3.2.2. Suburban George Town

This is considered the second phase and sewerage from this area would be treated at the Sewage Treatment Works 3.2.1. This phase would involve collection mains to feed into the mains already constructed in 3.2.1. The Sewage Works would be upgraded in this phase.

3.2.3. North West Bay Road and West Bay - This third phase would involve the construction of a second Sewage Treatment Works in the West Bay area, and construction of collection system. The distance from West Bay to the first Sewage Works being too great to consider pumping, greater problems of septicity in pipelines would occur and the pumping cost would be in excess of operating the two treatment works.

4. Project Achievements - 1982

4.1 Establishment of Office and Staffing

The office was established in February 1982. Temporary accommodations has been provided. The office has a reception area, three offices, a drawing and printing room and a laboratory. The local staff consist of, Project Coordinator, Engineer (Sewerage), Technician and a Senior clerical officer. At present one full time U.N. Associate Expert Engineer is provided at no cost (his contract has recently been extended for one further year) and a second full time U.N. Engineer will be on staff next month.

The Technician is presently on a three month U.N. Fellowship attached to the Barbados Water Authority. This is at no cost to the Project, and providing him a good grounding in the operational aspects of a water undertaking.

The functions of the staff are as follows: -

- | | |
|-------------------------|--|
| Project Coordinator | - Administration and Funding |
| M 8 | - Legislation administration |
| | - U.N. Coordination |
| | - Design, costing and construction supervision of Water Supply Projects |
| | - Secretary to the Authority |
| | - Operational aspects of Water Supply projects |
| | - Compilation of survey data |
| | - Development control |
| Engineer (Sewerage) | - Design and cost of Sewerage Projects |
| M17-11 | - Advise on other engineering aspects of project. |
| | - Prepare contract documents (Sewerage) |
| | - Supervision of construction |
| | - Deputise in Project Coordinator's absence. |
| Technician | - Monitoring of observation boreholes |
| M 40 | - Maintenance and observation of water level recorders and keeping records |
| | - Maintenance and observation of raingauges and keeping record |
| | - Water quality testing and well monitoring |
| | - Assist on engineering projects, with setting out, drafting, measurement |
| Senior/Clerical Officer | - Running the general office |
| M 45 | - Reception work |
| | - Typing and filing |
| | - Vote control and billing |

- U.N. Associate Expert (1) - Engineering design and construction, supervision of water supply projects under supervision
No cost
- Hydrogeological data collection and design of well fields
 - Drawing office duties
- U.N. Associate Expert (2) - Engineering design and construction supervision of sewerage projects under supervision
No cost
- Drawing office duties

The office is presently recruiting a Hydrogeologist whose functions will be to:-

- M 21-17
- Ground water investigations
 - Design of well fields
 - Monitoring and licencing existing abstractions
 - Determining and advising on pollution of ground water
 - Organizing water testing laboratory
 - Operation of computer
 - Interpretation of hydrogeological hydrological data

It is anticipated his salary will be recouped from licencing fees.

The office now has complete drafting facilities, a water testing facility for field and laboratory analysis of chemical and bacteria quality printing facilities for dyeline and letter copying, a micro desk top computer for data storage and engineering analysis, ground water monitoring and aquifer observations equipment. The majority of this equipment being provided by the U.N.

The office also operates two vehicles and a third is being provided by the U.N. next month.

Five rainfall stations have been established island wide and a further six are to be installed on the arrival of the equipment, providing invaluable hydrological data. Four permanent water level recorders are established on the three lenses and a fifth monitors tidal movement mid island.

4.2 U.N. Contribution

The U.N. has provided consultative assistance in:-

- 1) Hydrogeological investigation and interpretation
- 2) Legislation drafting
- 3) Establishing the Authority
- 4) Establishing the laboratory
- 5) Computer operation and programming.

It has and is in the process of providing the following equipment:-

- 1) All the laboratory and field water testing equipment
- 2) Toyota Hilux four wheel drive truck
- 3) Apple II computer, associated software and printers
- 4) Survey equipment
- 5) Some drawing office equipment
- 6) Raingauges

It is completely funding a Fellowship for the Cayman technician.

The 1982 contribution has been US\$44,800 with a 1983 budget of US\$34,500.

4.3 Legislation

A comprehensive Water Resources, Water Supply and Sewerage Law (Water Authority Law) was passed by the Legislative Assembly. Providing the Water Authority with adequate powers to protect and develop the water resources, provide a public water and sewerage service and administer its own affairs within the policy guidelines of Government.

The establishment of the Authority now awaits the Governor's assent to this Law.

Regulation to complement the law will be prepared in 1983.

4.4 Domestic Water and Sewerage Survey

This survey is now completed in George Town, West Bay Road, West Bay and East End. It has provided a baseline for the design data required for both sewerage and water supply and when compared to previous census information will assist in estimating development trends.

One other useful aspect of the survey has been to establish the areas where a water supply system is desperately needed, and has also provided a framework on which to establish a domestic well monitoring programme.

The survey was carried out very economically at a total cost of CI\$3,564.25.

The remaining areas will be surveyed when time permits.

4.5 Lower Valley Lens Investigation

In addition to the Dumbleton study, and on the advice of the U.N., further hydrogeological investigation was carried out on this lens in order to better determine the safe yield and to establish the damage that had been caused by commercial abstraction. This was completed in mid 1982 and formed the basis of the Lower Valley development scheme.

4.6 Lower Valley Development Scheme

This scheme has been designed, and costed at CI\$136,000.

It is to provide 100,000 galls/day to a 200,000 gallon reservoir. The water will be treated and sold to truckers. The cost will be CI\$6.50/1000 gallons, this will cover operating costs and amortization of capital over 20 years. Government has provided the funds to carry out these works.

Todate, materials are being ordered, land negotiations are virtually complete, (the majority of landowners accepting it as necessary) pipelines have been marked out and construction will commence 1st February 1983.

The works are to be carried out by various subcontractors; trenching, utilizing the Cable & Wireless machine at an acceptable rate. A temporary employee has been hired out of project funds to assist with setting out, plumbing and installation of pumps.

The present peak trucked water demand is estimated at 140,000 galls/day. The Cayman Water Company, with its additional capacity, can provide limited quantity of water to truckers but at a the higher cost of \$16.60/1000 gallons.

The water legislation will prevent the truckers utilizing their private wells as they have in the past.

4.7 Public Awareness Campaign

A campaign to inform the public is now in the latter stages of completion, the time of adoption of the campaign will depend on future developments.

4.8 Assistance with Agricultural Water Demands

The water supply of numerous agricultural projects has been investigated and recommendation on irrigation development made. At present this service is carried out at no cost, but later on in the development of the Authority it is expected to be a form of revenue.

5. Expenditure 1982

The projects 1982 Capital allocation was CI\$100,000.

Expenditure under this head in 1982 was CI\$91,215.34 and was expended as follows :-

- Equipment, tools and vehicle	CI\$ 29,540.03
Rental of property	14,294.06
- Lower Valley drilling investigations	18,166.70
- Lower Valley development materials	12,523.99
Domestic Water & Sewerage Survey (part)	564.25
- Vehicle hire	3,519.00
Freight and Port charges	1,709.39
Office electrical work	1,950.00
Reference books and standards	1,120.22
- Lands & Survey printing	800.00
Office furniture	7,027.70
1982 Recurrent allocation was	CI\$ 63,076.00
Expenditure was	59,161.43

6. Funding

6.1 Informal talks have taken place with the Caribbean Development Bank and it would appear, reasonable forms of funding for capital works is available. Sanitation projects are a high priority, they offer 80% funding at rates less than 10%, with upto a 7 year moritorium on principal.

6.2 Under the law the financial procedure of the Authority permits it to obtain funding from outside source, but until such time as the large capital projects commence it is expected that Government will act as banker, as it is unlikely that the Authority will maintain financial viability within the first years.

Economic analysis have been carried out, but as stated previously without knowing, with reasonable accuracy, the demand for water, the exercise is somewhat random.

6.3 The office has been successful in obtaining a US\$10,000 grant from the Canadian Government through its M.A.F. (Kingston). This funding to be used on the Lower Valley development.

6.4 A financial document for Water Supply is in the process of being prepared. The contents of which will include demands, justifications, scope of financing required to complete all phases of the project. It will indicate to Government the commitment required on which a financing policy can be based.

7. Future Revenue

Revenue will be derived from the following:-

- 1) Sale of Water.
- 2) Commercial well licences.
- 3) Development control.
- 4) Plumber licences.
- 5) Sludge tanker operator licences.
- 6) Well diggers licences.
- 7) Water supply connection fees.
- 8) Meter charges.
- 9) Sewerage connection fees.
- 10) Sewerage charges

Items 1 - 6 will apply in 1983.