

PUBLIC

DOCUMENT OF THE INTER-AMERICAN DEVELOPMENT BANK

TRINIDAD AND TOBAGO

STUDIES OF POTABLE WATER SUPPLY

(TT0026)

LOAN PROPOSAL

1967

I N D E X

TRINIDAD AND TOBAGO: STUDIES OF POTABLE WATER SUPPLY

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SUMMARY OF THE PROPOSED LOAN

TRINIDAD AND TOBAGO 1/

Technical Assistance for the Study of the Water Systems and Resources

1. BORROWER: Trinidad and Tobago.
2. EXECUTING AGENCY: The Water and Sewerage Authority.
3. AMOUNT AND CURRENCY: Up to US\$ 300,000 in United States dollars or its equivalent in other currencies which are part of the resources of the Fund for Special Operations.
4. SOURCE OF FUNDS: Fund for Special Operations.
5. TERM, INTEREST, SERVICE CHARGE, COMMITMENT FEE AND DISBURSEMENT PERIOD; CURRENCIES OF PAYMENT:
 - a) Amortization: The loan will be amortized within a period of 10 years, by means of 17 consecutive semi-annual payments, the first of which will be made 2 years after the date of the contract. Payments will be made in local currency or proportionately in the currencies disbursed, at the option of the borrower.
 - b) Interest: Interest will accrue at the rate of 2-1/4% per annum, payable semi-annually on the same terms as the amortization, the first payment due 6 months after the contract date.
 - c) Service charge: A service charge of 3/4% per annum will be payable semi-annually on outstanding balances, proportionately in the currencies disbursed, the first payment due 6 months after the contract date.
 - d) Commitment fee: A commitment fee of 1/2% will be charged, payable semi-annually in United States dollars on the undisbursed portion of the loan beginning to accrue 60 days after the date of the contract, with the first payment due 6 months after that date.
 - e) Disbursement period: The loan will be disbursed in a period of 1-1/2 years.
6. GUARANTEE: The general responsibility of the debtor.
7. DESCRIPTION OF THE PROJECT: The purpose of the project is to carry out through the contracting of consultants a general study of the current situation regarding potable water in Trinidad and Tobago; make projections of the future needs and formulate recommendations for

1/ Rate of exchange: US\$ 1.00 = TT\$ 1.70

the improvement and expansion of the existing systems.

The study would include a review of available information on the natural water resources and the trends in domestic and industrial use as related to the capacity and efficiency of the present overall water system, and the recommendation of a long-term program of improvement and expansion of the system in order to supply the country with sufficient water for at least the next 25 years. Within this program a first stage of approximately 10 years would be defined, including the identification of the specific project or projects having highest priority and the preparation of basic information for possible financing and implementation of the same. In addition, specific recommendations would be made for an interim program designed to increase the administrative and technical efficiency of the existing facilities, and to improve the water rates structure and collection procedure.

8. FINANCIAL PLAN:

(In thousands of US\$)

Contribution	Source of Funds		Use of Funds		Total	%
	Local	Foreign	Local	Foreign		
I D B	-	300	-	300	300	60
Government of Trinidad and Tobago	200	-	125	75	200	40
TOTAL	200	300	125	375	500	100
Percentages	40	60	25	75	100	

The costs of the project would be distributed as follows:

(In thousands of US\$)

Item	I D B	Trinidad-Tobago	Total	%
1. Services of consulting firms and/or professionals and technicians	252	-	252	50.4
2. Offices, local auxiliary personnel, administration, transportation, other local services, etc.	-	170	170	34.0
3. Contingencies	45	30	75	15.0
4. Inspection and supervision	3	-	3	0.6
Totals	300	200	500	100.0

9. JUSTIFICATION: The study of the country's water systems and resources with a view towards improvement and expansion has been assigned high priority by the Government of Trinidad and Tobago. Current supplies of water are already inadequate in many areas and by 1970 there will begin to occur acute shortages which, without a program of improvement and/or expansion will prove to be particularly serious as a result of the rapid increase in population and in relationship to the planned accelerated industrial and rural development.
10. RECOMMENDATION: On the basis of the conclusion by the Project Committee that the project is technically, economically and financially justified, the Operations Department submits this loan document to the President of the Bank for his consideration so that the corresponding draft resolution may be submitted to the Board of Executive Directors for approval, if he could consider it advisable.

ANALYSIS OF THE PROJECT

Loan to Trinidad and Tobago

(Water and Sewerage Authority)

I. INTRODUCTION

- 1.01 In May of 1967 the authorities of the Government of Trinidad and Tobago indicated their preliminary interest in an eventual IDB loan for technical assistance in potable water, and sent general background information for the Bank's review.
- 1.02 A mission of the Bank visited Trinidad and Tobago between July 30 and August 5, 1967, with the purposes of establishing contact with the authorities of the country and informing them of the policies and procedures of the IDB, and of obtaining general information, initiating studies and discussing proposals in order to establish priorities on which to base a preliminary program for 1967-1969.
- 1.03 From these conversations it was established that a loan of US\$ 300,000 for technical assistance for potable water supply could be considered for 1967. On August 10, 1967, the Government of Trinidad and Tobago sent to the Bank the corresponding application.
- 1.04 Between August 28 and September 7, 1967, a member of the Sanitary Engineering Section of the Project Analysis Division of the Bank visited Trinidad and Tobago with the purposes of obtaining the necessary additional information for the consideration of the application, discussing with the officials of the Water and Sewerage Authority the terms of reference for a technical assistance project and analyzing the organization and operations of the Authority.

II. THE BORROWER AND THE EXECUTING AGENCY

A. Name and Identity

- 2.01 The borrower will be Trinidad and Tobago. As explained in the Legal Report, Annex III, an appropriate Act of Parliament will be necessary for Trinidad and Tobago to borrow from the Bank. The passage of this Act will be a condition to the signature of the loan contract. The Bank has been informed that there will be no difficulties in connection with the prompt approval of said Act.

- 2.02 The executing agency will be the Water and Sewerage Authority, an autonomous entity responsible to the Minister of Public Utilities of the Government, with legal domicile in the capital city of Port of Spain.

B. Legal Personality and Capacity

- 2.03 The Water and Sewerage Authority was established on September 1, 1965 by Act No. 16 of Parliament. This Authority has full legal capacity to undertake the proposed project. (See Annexes I and III for more details on the Authority).

C. Principal Line of Activity

- 2.04 In the field of water supply the Authority is responsible for administering, maintaining and developing the water works and promoting the conservation and proper use of water resources and the provision of water supplies in Trinidad and Tobago.
- 2.05 The Authority is also responsible for the maintenance and development of sewerage systems and the administration of sewerage services.

D. Financial Situation

- 2.06 Due to the fact that the Authority was only established in September, 1965, its only available published financial information are the operating budgets for 1966 and 1967, and the capital investment budgets for 1965, 1966 and 1967.

The summarized operating budgets, are as follows:

(In thousands of US\$)

	<u>1 9 6 6</u>	<u>1 9 6 7</u>
<u>Estimated Expenses</u>		
Personnel emoluments	1,156	1,312
Other charges	7,369	6,041
Extraordinary	<u>430</u>	<u>147</u>
	<u>8,955</u>	<u>7,500</u>
<u>Estimated Revenue</u>		
Water service	3,200	3,422
Sewerage service	717	727
Other	-	118
	<u>3,917</u>	<u>4,267</u>
Estimated Deficit	5,038	3,233

- 2.07 The operating deficits of the Authority have been covered by Government grants through 1967, but in following years they will be covered by Government loans. It is expected that such loans shall bear low interest and have long amortization periods with substantial periods of grace.
- 2.08 The Water Act requires the Authority to exercise its functions so as to ensure that its revenue is sufficient to cover compensation, operating expenses, long-term loans and expansion. As can be seen, however, the current system for the application of utilities rates and the collection of revenue may not be considered adequate and for this reason will receive special attention in the proposed technical assistance.

The application of utilities rates is based upon the value of the property served, and does not necessarily have any direct relationship with the water (or sewerage) service provided. Partially as a result of this system, the revenue collected is far short of the Authority's annual financial needs. As indicated, in 1966 the revenue collected covered only approximately 45% of operating expenses and in 1967 it is expected to cover about 57%. (See paragraph 6.04 of Annex I for more information on the water rates system).

- 2.09 For capital investment the Authority receives grants from the Government. Since its establishment, the Authority has carried out its capital investment program with the following annual budgets.

	(In thousands of US\$)		
	<u>1 9 6 5</u>	<u>1 9 6 6</u>	<u>1 9 6 7</u>
Sewerage	3,920	3,058	580
Water	1,814	1,118	1,136
Accommodation	<u>7</u>	<u>29</u>	<u>188</u>
	<u>5,741</u>	<u>4,205</u>	<u>1,912</u>

An explanation of these budgets is found in section 6.05 of Annex I.

- 2.10 The total debt of the Authority (not including the above-mentioned Government loan), is the equivalent of approximately US\$ 10,330,000, of which approximately \$ 5,000,000 is outstanding.

Debt service for these loans is included in the Authority's budget and was the equivalent of US\$ 2,100,000 and US\$ 1,900,074 in 1966 and 1967, respectively.

- 2.11 In sum, the financial situation of the Authority indicates that improvements are advisable, particularly with respect to the system of water rates, before this agency takes on a major construction program and, more generally, becomes a fully independent institution capable of developing, administering and maintaining the country's water (and sewerage) system. The Government's policies and practice of support for the Authority (in addition to the assurances that the Bank will require for the timely provision of sufficient additional funds for the project) indicate, however, that there would be no financial problems involved in the execution of these proposed studies. In addition, the Authority will be asked to submit to the Bank a plan and schedule for the improvement of its accounting and financial procedures, which are now being studied by a group of consultants.

E. Management

- 2.12 The Authority is capable of serving as Executing Agency of the proposed project. It has shown an ability to take upon itself the functions and responsibilities of the diverse agencies concerned with the water supply before 1965, and carry through the projects previously initiated. Furthermore, the Authority has highly qualified senior personnel, as may be seen from the curriculum-vitae of the major officials included in Appendix B.

Nevertheless, as the Authority has been established for only about two years, one of the objectives of the proposed loan is to provide recommendations for the improvement of its organization and administration to enable it to both increase the efficiency of the existing facilities and effectively carry out the proposed program of expansion.

III. THE PROJECT

A. Description

- 3.01 The project to be financed with this loan represents the preparatory work for a long-term overall program for the eventual improvement and expansion of the water systems in Trinidad and Tobago. This program is designed to provide a sufficient water supply for the country for both domestic and industrial purposes during at least the next 25 years.
- 3.02 The project calls for the contracting of consultants to carry out a general study of the current situation regarding potable water in Trinidad and Tobago, make projections of future needs and formulate recommendations for the improvement and expansion of the water systems, and for improvements in the administration and organization of the Water and Sewerage Authority.
- 3.03 In particular, the project (as described in Appendix A) would include the following aspects:
 - a) A review of the available information related to the natural water resources, existing potable water systems and the relevant socio-economic characteristics of Trinidad and Tobago, and upon this, estimates of present and future availabilities and needs of potable water for industrial and domestic use. (According to paragraphs A, B, C and D of Appendix A).
 - b) Recommendation of a general program of improvement and expansion of the potable water systems of Trinidad and Tobago, in order to meet industrial and domestic requirements until at least 1994 with the identification of specific projects.
 - c) Within this general program referred to in paragraph b), the definition of a first stage for meeting industrial and domestic water requirements in Trinidad and Tobago for at least the first ten years, including, if deemed advisable by the Bank and the borrower, feasibility studies of the specific project or projects having highest priority, and a close estimate of the costs, preliminary engineering designs and other necessary factors for the possible financing and execution of the same.
 - d) Recommendations of measures for the administrative, technical, financial and institutional improvements and/or changes required for the effective execution of the programs mentioned in paragraphs b) and c).
 - e) Recommendations concerning an interim program for the full and effective utilization of existing facilities, including such aspects as increased efficiency in the operation of the physical plant, administrative and institutional improvements and the installation of meters, and studies and recommendations on the application of an adequate system of water rates and the collection of revenue, to be initiated within this interim program

- 3.04 A general hydrological study of the country is now being carried out by a consulting firm. This study is well advanced and will be able to provide sufficient information to serve as a basis for the studies to be partially financed with this proposed loan.
- 3.05 To the extent that the studies result in the identification of a specific project (or projects) for possible execution, all the information necessary to begin construction on such projects shall be provided by the consultants, with the exception of the final detailed engineering designs and certain specific field studies. Furthermore, if there is a surplus of funds from the resources of the project after the fulfillment of the principal objectives, and a decision is made to select a specific project or projects for immediate implementation, based upon the preliminary reports of the consultants and with the prior approval of the Bank, these surplus funds could be channeled towards the necessary final designs and studies of such a project or projects.
- 3.06 On the other hand, the studies may lead to a decision to postpone major construction projects for several years, particularly if the above-mentioned interim program could sufficiently raise the efficiency of the existing system. In any event this interim program shall be designed to serve as a complement and, if necessary, temporary alternative to a major construction program.

B. Financial Plan

- 3.07 The project would be financed as follows:

(In thousands of US\$)

<u>Contribution</u>	<u>Source of Funds</u>		<u>Use of Funds</u>		<u>Total</u>	<u>%</u>
	<u>Local</u>	<u>Foreign</u>	<u>Local</u>	<u>Foreign</u>		
I D B	-	300	-	300	300	60
Government of Trinidad and Tobago	200	-	125	75	200	40
Total	200	300	125	375	500	100
Percentages	40	60	25	75	100	

- 3.08 The total cost of the project would be the equivalent of approximately US\$ 500,000, which would be distributed in the following manner:

(In thousands of US\$)

<u>Items</u>	<u>Foreign costs</u>	<u>Local costs</u>	<u>Total</u>	<u>%</u>
1. Full-time consultants	175	-	175	35.0
2. Short term consultants	22	-	22	4.4
3. Consultants for organization and administration	42	-	42	8.4
4. Travel	-	15	15	3.0
5. Head office expenses	22	-	22	4.4
6. Sub-contracts	48	30	78	15.6
7. WASA supporting services	-	50	50	10.0
8. Fees	18	-	18	3.6
9. Contingencies	<u>45</u>	<u>30</u>	<u>75</u>	<u>15.0</u>
Subtotal	372	125	497	
10. Inspection and supervision	<u>3</u>	<u>-</u>	<u>3</u>	<u>0.6</u>
Total	<u>375</u>	<u>125</u>	<u>500</u>	<u>100.0</u>

C. Expenses Previously Incurred

3.09 No expenses have been incurred on this project, in accordance with the information available.

D. Foreign Exchange Cost

3.10 The major foreign exchange cost in the project shall be for the services of foreign consultants. As indicated above, such costs could amount to the equivalent of approximately US\$ 375,000.

E. Financing from Other Sources

3.11 The local contribution will be mostly in cash, with the remaining amount in the form of services and contributions in kind, which in no case shall exceed 10% of the total cost of the project. The local contribution shall derive from a specific budgetary authorization and allocation, which has already been requested of the Ministry of Public Utilities to be included in the 1968 Budget. Before the first disbursement, the Bank shall receive, to its satisfaction, adequate assurances that there will be timely provision of sufficient additional resources to carry out this project. Such resources may in no case be less than the equivalent of US\$ 200,000.

F. Execution of the Project

3.12 The Authority shall be responsible for the execution and general administration of the project and will provide support and assistance as needed. The studies will be carried out entirely

by consultants and/or consulting firms, contracted for this purpose. In the selection of such consultants and/or firms, particular attention will be given to the need for specialization in the fields of water resources and supply studies, and organizational and administrative analysis. Thus the services of possibly two separate firms may be required in order to effectively carry out each respective study, though consideration shall also be given to a single firm sufficiently specialized in both fields.

- 3.13 The period of execution of the studies should be approximately 12 months, but it is expected that the project as a whole, from the time of the selection, contracting and orientation of the firms or experts to the preparation of the final reports would be 18 months. Disbursements will be made on a "pari-passu" basis.
- 3.14 The Authority has expressed its hope that, if it becomes apparent during the course of the studies that an immediate expansion effort is necessary, the consultants will be far enough advanced in their work by late 1968 to have identified and elaborated, among those projects that may be executed within the overall program, one high priority project to a sufficient degree of detail to allow for the preparation of the final engineering designs, a call for bids on the construction, and the negotiations for financing, in the event that a decision is made to proceed with execution of such a project. This schedule will be met only to the extent that it is justified in the interests of the preparation of the overall program.
- 3.15 The procedure for the contracting of the services of the consulting firms should follow accepted international practices, and be in accord with the policies established by the Bank, taking into account the applicable legislation of Trinidad and Tobago. In any case, the Authority should submit for the Bank's approval the following:
- a) The procedures to be utilized in the selection of the consulting firms.
 - b) A list of the firms that would be considered for the project;
 - c) The terms of reference for the work to be done by the consultants;
 - d) The contract to be signed with the consulting firms selected by the Authority.

The actual selection procedure is explained in more detail in Section 5.04 of Annex I.

- 3.16 An amount equivalent to US\$ 3,000 shall be allocated from the resources of the loan for the purposes of inspection and supervision. No project engineer will be required.

- 3.17 In order to give this technical assistance project the appropriate orientation and guidance during its execution, preliminary reports on at least the long-term plan and the first stage plan shall be submitted by the consultants for review and approval to the Authority and the Bank, in accordance with an agreed upon schedule. The recommendations to be included in the final report will be determined on the basis of this periodic review. In addition, other information or reports may be requested by the Bank and/or the Authority whenever necessary.

IV. JUSTIFICATION OF THE PROJECT

- 4.01 As explained in Chapter II and Annex I, the project is feasible in light of the administrative capacity of the Water and Sewerage Authority. In addition, paragraph 4.04 of Annex I gives a breakdown of the cost estimates of each item to be financed in the proposed project, indicating that the resources shall be sufficient to fulfill the objectives of this loan.
- 4.02 A contingency factor of approximately 15% was applied to these cost estimates, as it is difficult to predict with certainty the exact costs of technical assistance services.
- 4.03 The soft terms of the loan are justified in light of the fact that while the proposed studies would have a favorable long-range effect on the economy of Trinidad and Tobago, they will result in no measurable immediate economic return.
- 4.04 The proposed studies are essential for the efficient planning of an effective program for the improvement and expansion of the water system of Trinidad and Tobago. They will also serve as a basis for negotiation with international lending institutions for possible financing of specific construction projects.
- 4.05 An increase in water supplies is necessary to stem the shortages predicted for 1970 and thereafter. Such shortages would result in serious health problems for the people of the country, particularly as the population is increasing at the high rate of approximately 3% annually. In addition, insufficient water supplies would hinder the country's vital diversification program, both in industrial and rural development.

V. CONCLUSIONS AND RECOMMENDATIONS

- 5.01 In light of the benefits that will be derived from the program in this document and, since there exist no administrative, technical or financial impediments, nor any of a legal nature with the exception of that mentioned below, for its execution, it is recommended that a loan of up to US\$300,000 or its equivalent be granted to Trinidad and Tobago to finance studies of potable water supply, subject to the terms and conditions set forth in the proposed resolution accompanying this document.
- 5.02 It is also recommended that prior to the signing of the loan contract the debtor shall establish that an appropriate Act of Parliament has been passed which authorizes Trinidad and Tobago to borrow funds from the Bank and which appropriates the borrowed funds for the purposes to be specified in the loan contract.
- 5.03 It is further recommended that, in addition to the terms and conditions of the resolution, the following conditions, to be complied with to the satisfaction of the Bank, shall also be included in the loan contract and/or in the Technical Assistance Agreement to be entered into between the Bank and the executing agency.
- (a) Prior to the first disbursement the debtor shall present to the Bank an agreement with the Water and Sewerage Authority (hereinafter referred to as the "Authority") with respect to (i) appointment of the Authority as executing agency for the project, (ii) formal financial arrangements between the debtor and the Authority for use of funds derived from the loan and provision of required additional local funds and services, and (iii) administration of the project.
 - (b) Within six months following the signature of the loan contract the debtor shall present to the Bank through the Authority a plan and schedule for improving the accounting and financial procedures of the Authority.
 - (c) The Authority shall contract directly for the services of consultants or consulting firms to undertake the required studies. The procedures proposed to be used by the Authority for the selection of such entities, the name or names of the entities with which the Authority proposes to enter into contracts, the terms of reference, as well as the draft contracts, shall be submitted to the Bank for its prior approval. At the request of the Authority, the Bank may cooperate in finding and selecting such entities and in drafting the respective contracts, provided, however, it shall be understood by the parties that it will undertake such assistance in an advisory capacity and that the final negotiations, as well as the actual execution of the respective contracts, will be the responsibility of the Authority.

- (d) Every contract to be entered into with respect to services to be performed in connection with the studies shall contain provisions requiring the contracting entity to:
 - (i) Present to the Bank and the Authority for review and approval quarterly reports on the progress of their work, and final reports on the results in a form satisfactory to the Bank.
 - (ii) Furnish the Bank directly such additional information or reports as it may reasonably require.
- (e) The Authority shall maintain separate accounts for the project indicating the expenses and other costs incurred in undertaking the studies.
- (f) In the event that there should be a surplus of funds from the resources of the project, such funds may be utilized for the execution of final field studies and the preparation of final engineering designs for the construction of specific water supply works contemplated for the first stage program as defined in Appendix A of this document, provided however, that the Bank shall have determined that such utilization shall not adversely affect the overall purposes of the project. The debtor shall obtain the p r i o r approval of the Bank for such utilization and the consultants or consulting firms shall be selected in accordance with the provisions of paragraph 5.03 (c).
- (g) The resources of the loan may not be utilized for the payment of salaries, "per-diem" and other similar expenses of the personnel of the Authority, nor may such funds be used for the payment of any administrative expenses of the Authority.
- (h) US\$3,000 from the resources of the loan shall be utilized to cover inspection and supervision expenses.
- (i) The loan contract will incorporate an annex substantially similar to Appendix A (Description of the Project) of this document.
- (j) The United States dollars utilized for the loan shall be derived from the resources contributed to the Fund for Special Operations in accordance with the increase approved by Resolution AG-2/65.

ANNEX B OF THE LOAN CONTRACT

DESCRIPTION OF THE PROJECT

This Project consists of studies of the current potable water situation in Trinidad and Tobago, projections of future requirements and recommendations for the improvement and expansion of the water systems and for improvements in the administration and organization of the Water and Sewerage Authority. The Project will be carried out through contracting the services of consultants and/or consulting firms.

The Project includes principally the following:

- A. A review of the available information concerning the physical characteristics and the socio-economic conditions of Trinidad and Tobago relating to potable water supply and sewerage in order to provide a general background for the following specific studies:
- B. A study of the present and future requirements of potable water for industrial and domestic purposes;
- C. A study of the existing water systems, in order to evaluate their capacity to meet the present and future demand and determine their relationship to a program of expansion;
- D. A review of the available information on the natural water resources of Trinidad and Tobago, as related to the possible development of sources of supply for potable water systems.
- E. Recommendation of a general program of improvement and expansion of the potable water systems of Trinidad and Tobago, in order to meet industrial and domestic requirements until at least 1994 with the identification of specific projects.
- F. Within this general program referred to in paragraph E, the definition of a first stage for meeting industrial and domestic water requirements in Trinidad and Tobago for at least the first ten years, including if deemed advisable by the Bank and the borrower, feasibility studies of the specific project or projects having highest priority, and a close estimate of the costs, preliminary engineering designs and other necessary factors for the possible financing and execution of the same.
- G. Recommendations of measures for the administrative, technical, financial and institutional improvements and/or changes required for the effective execution of the programs mentioned in paragraphs E and F.

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- H. Recommendations concerning an interim program for the full and effective utilization of the existing facilities, including such aspects as increased efficiency in the operation of the physical plant, administrative and institutional improvements, and the installation of meters.
- I. Studies and recommendations on the application of an adequate system of water rates and the collection of revenue, to be initiated within the interim program.

The project, which would be executed in a period of not more than 18 months, at a total cost of the equivalent of US\$ 500,000, would be financed by an IDB loan of up to the equivalent of US\$ 300,000 in United States dollars or other currencies of the Fund for Special Operations to cover the costs of contracting the consultants or consulting firms, and by a contribution equivalent to no less than US\$ 200,000 from Trinidad and Tobago to cover local costs and certain foreign expenditures.

BIOGRAPHICAL DATA OF PRINCIPAL OFFICERS OF THE "WATER AND SEWERAGE AUTHORITY"

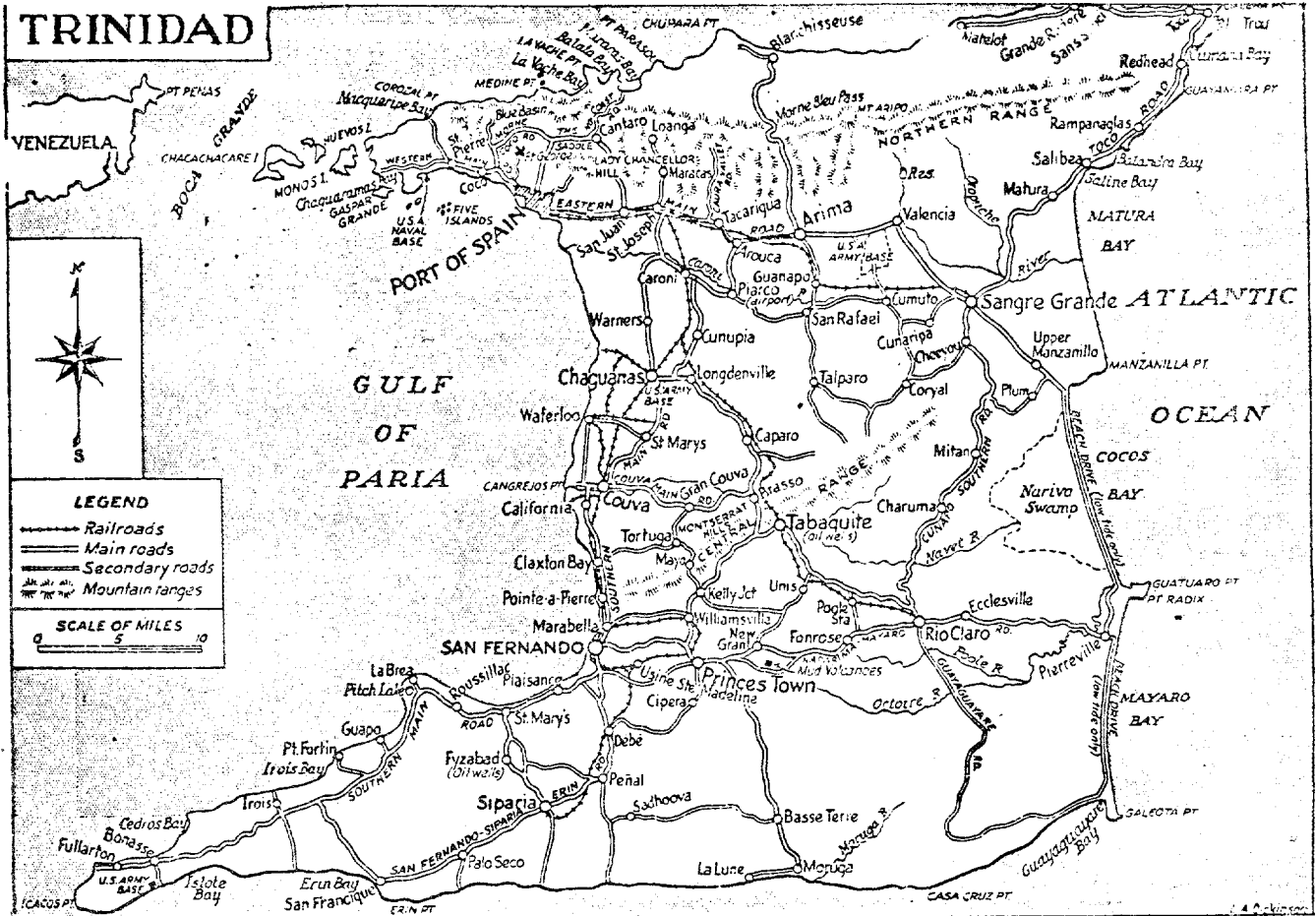
Name	Qualifications	Post Held
Horace O. Roberts		Acting Commissioner of Industry & Commerce - 1956 President Trinidad Manufacturers Association Mem. Board of Industrial Development Corporation General Manager, Caribbean Printers Ltd. Chairman, Water and Sewerage Authority. 1965
W. E. Daniel	B.Sc.Economics - 1958	Senior Economist, Ministry of Planning & Development 1959 Deputy Executive Director, Water & Sewerage Authority, 1965 Actg.Executive Director, W.A.S.A. 1966
R. K. Bates	B.Sc.(Lond)(Eng) - 1941 D.I.C.(Public Health Eng.)1953 D.I.C.(Concrete Technology)1959 D.I.C. = Diploma of Imperial College of Science & Technology	Chief Technical Officer (Sanitation)Min.of Health, Water & San.1960 Ch.Tech.Officer (Sanitation) 1962 Ministry of Public Utilities Superintendent Engineer (Sanitation) Water & Sewerage Authority, 1965 Head of Technical Services, W.A.S.A. 1967
R. Aquí Philip	Sen. Cambridge Member of Institute of Office Management - 1965	Secretary, former Central Water Distribution Authority - Actg.General Manager, C.W.D.A. Secretary, Water and Sewerage Authority. 1965
E. Jones	A.A.C.C.A-Associate of the Association of Certified and Corporate Accountants, June 1966	Chief Accountant, National Housing Authority Senior Accountant, Water and Sewerage Authority. 1967
M. Sankeralli	B.Sc.(Lond) Civil Engineering - 1958 D.I.C. Diploma of Imperial College M.Sc.(Eng.Hydrology) 1965	Actg.Dep.Water & Sewerage Works Engineer, P.O.S.City C. Actg.Supt.Engineer (Water) 1965 Water & Sewerage Authority Actg.Head of Water Services 1967 (Supply & Rural Distribution), W.A.S.A.

Name	Qualifications	Post Held
R. Amoroso	B.Sc.(Civi. Engineering) 1960 M.Sc. (Sanitary Engineering) 1961 S.E. (Transportation Engineering) 1962	Sanitary Engineer, former Sanitation Dept. 1963 Actg. Technical Officer, 1967 Planning & Development, W.A.S.A. Actg. Head of Planning and Development. 1967
L. A. Boyce	B.Sc.(Civil Eng.) 1956 M.Sc.(Highway and Traffic Engineering) 1961	Actg. Water & Sewerage Works 1962 Engineer, P.O.S. City Council Actg. Head of Urban Services 1967 Water and Sewerage Authority
S. Chinasing	Higher National Certificate 1955 A.M.I.E.E. - Associate Member of the Institution of Electrical Engineers - 1964	Asst. Area Engineer (Construction) T'bad & T'go Elec. Commission Electrical Engineer, Water Dept. Ministry of Public Utilities, A Ch. Electrical & Mechanical Engineer, (Actg.), W.A.S.A. 1967
Emile W. Warner	B.Sc.(Chem) 1957 D.I.C. (Public Health Engineering) 1963	Water Biologist, former Water Dept., Min. of P.U. 1957 Chief Chemist, Water & Sewerage Authority 1965
H. St. George	B.Sc.(Civil Eng.) 1959 M.Sc. (Sanitary Engineering) 1965	Engineer Operations, Water Dept., Min. of Public Utilities Actg. Chief Engineer Supplies, Water & Sewerage Authority Actg. Head of Water Services W.A.S.A. (vice M.Sankeralli who is on vacation leave.) 1967

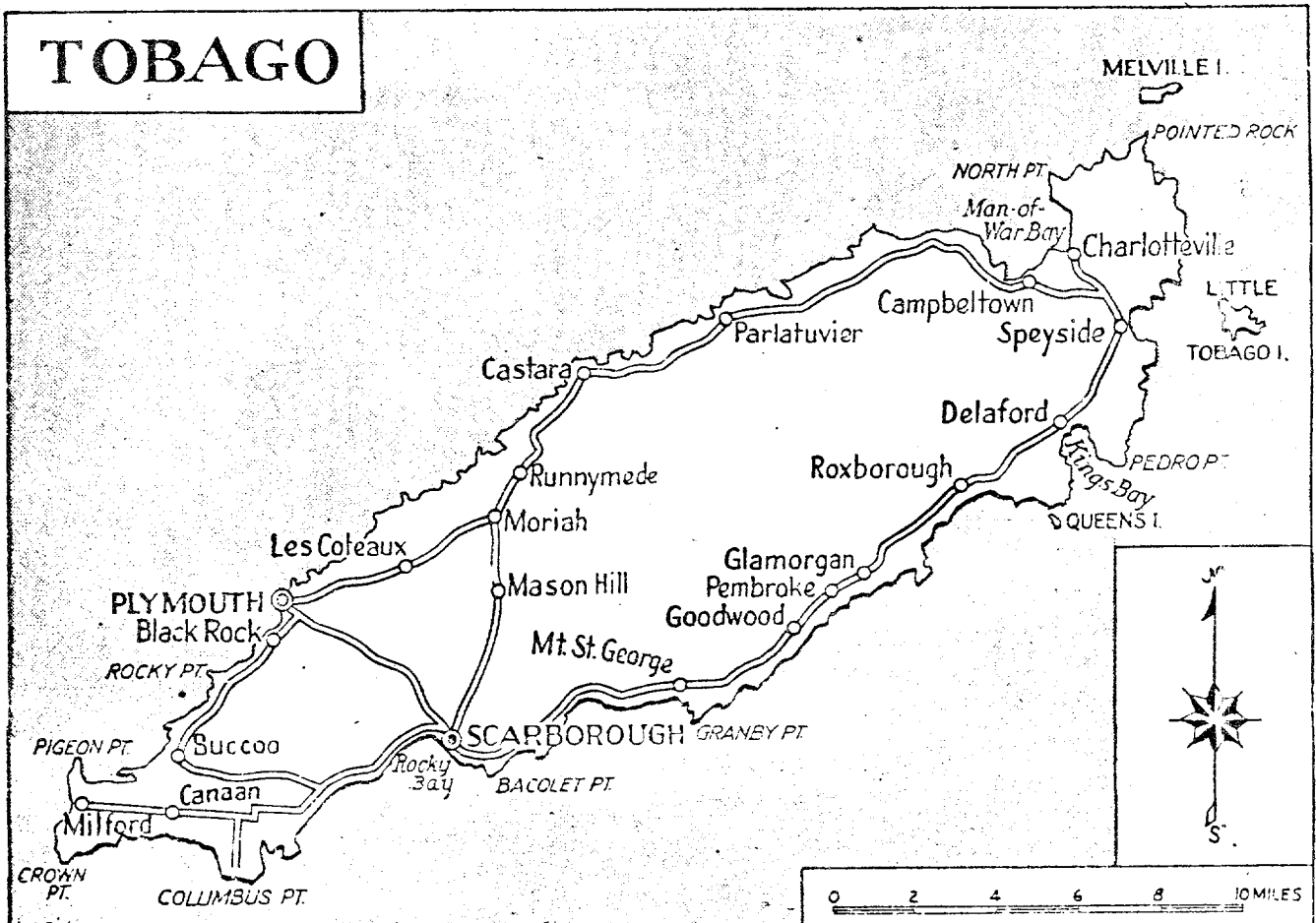
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APPENDIX C

TRINIDAD



TOBAGO



TECHNICAL ASSISTANCE LOAN
TO THE
GOVERNMENT OF TRINIDAD AND TOBAGO
(Water and Sewerage Authority)

T E C H N I C A L R E P O R T

SECTION I. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

1.01 SUMMARY

The technical assistance plan would consist mainly in contracting expert consultants for the purpose of formulating a long-term plan for the development of potable water supply in Trinidad and Tobago. A detailed first phase should be considered for immediate execution. Assistance should also be given to the Authority on matters of internal organization.

1.02 CONCLUSIONS

The conditions of the water supply systems presently serving the country and the increasing domestic and industrial demand, lead to the conclusion that the general and detailed plans for the development of the water supply systems of Trinidad and Tobago are a matter of great urgency. The need for expert consultants is also apparent.

1.03 RECOMMENDATIONS

a) Technical

It is recommended that the work be carried out by expert consultants acceptable to the Bank. The terms of reference for the consultants' work should comply with the requirements of Appendix No. I.

b) Financial

It is recommended that the necessary measures be taken to ensure the timely appropriation of resources in the National budget of Trinidad and Tobago. Furthermore, prior to the first disbursement, the Authority should submit for the approval of the Bank its plan and a schedule for the implementation of the recommendations by the consultants presently studying the Authority's financial structure.

c) Administrative

It is recommended that special attention in the studies be given to improvement of the Authority's internal organization to enable it to better carry out the proposed expansion program.

SECTION II. TECHNICAL ANALYSIS OF THE EXECUTING AGENCY

2.01 The Water and Sewerage Authority has been created by the amalgamation of five different agencies:

- (i) The Water Department of The Ministry of Public Works, responsible for the greater part of the country's production of water;
- (ii) The Central Water Distribution Authority, responsible for the distribution of water to all parts of the country, except the corporate areas of Port-of-Spain, San Fernando and Arima;
- (iii) The water supply service maintained by the city council of Port-of-Spain;
- (iv) The water supply service maintained by the borough council of San Fernando;
- (v) The water supply service maintained by the borough council of Arima.

2.02 The Act No. 16 of 1965 of the Parliament of Trinidad and Tobago (Water and Sewerage Act, 1965) established the Authority on September 1st., 1965. The Authority is an autonomous body under the general control of the Ministry of Public Utilities. It is governed by a Board of Commissioners "appointed by the Governor-General as follows:

- a) Three members being technical officers representative of:
 - (i) The Ministry concerned with the subject of Agriculture;
 - (ii) The Ministry concerned with the subject of Health;
 - (iii) The Ministry concerned with the subject of Local Government, and
- b) four members who have had experience of and shown capacity in matters related to trade, law, finance, science, administration or labour relations, of whom one shall be Chairman and another Deputy Chairman."

According to the Water and Sewerage Act, the Authority should be an autonomous public institution. Nevertheless, the current practice of government in the country, has imposed a number of restrictions on the Authority's autonomy. The principal limitations are as follows:

- a) The personnel is appointed, disciplined and dismissed by the Statutory Authorities Service Commission, by recommendation of the Authority.
- b) Salaries and wages as well as classification and working conditions, are set by the Classification and Compensation Unit of the Government's Chief Personnel Officer.
- c) Acquisitions and contracts worth over TT\$ 10,000 (US\$ 5,880) are processed through the Central Tenders Board, an agency related to the Ministry of Finance.
- d) The internal organization of the Authority must be approved by the Organization and Methods Department, Ministry of Finance.
- e) The budget of the Authority is part of the National Budget and must be approved by the Cabinet and the Parliament.

2.03 A proforma organization chart of the Authority is found in Appendix No. II. There are actually many overlappings and deviations from this model. In fact, the organization is considered unsatisfactory by all the higher officials of the Authority. Various studies are being made for a new organization; Appendix No. III shows a proposal prepared by the Organization and Methods Department of the Ministry of Finance. It appears to be a first draft that still needs much refining. An appropriate organization of structure is a matter of great need and an urgency for the proper development of the Authority's work.

2.04 The Authority has an authorized staff of 500 persons, including 20 engineers. The officials of the Authority have expressed their opinion that the agency is understaffed. It appears that there is indeed a shortage of qualified personnel in various levels. It is also apparent, though, that a better internal organization and better deployment of personnel would improve efficiency. It would also be advisable to immediately establish a definite personnel structure and proper appointment of the officers and employees.

The existing personnel appears to be technically well qualified. Most of the engineers and high level officials have taken post-graduate courses in English, Canadian and American universities. There are also some excellent quasi-professionals and technicians.

2.05 The present installations of the Authority's head office are not entirely satisfactory. There is a plan for the construction of permanent headquarters in St. Joseph, about 8 miles from Port-of-Spain. In the capital investment estimates for 1967 there is an allocation of TT\$ 320,000 (US\$ 188,000), part of which

should be used for this purpose. The furniture and office utensils are frequently outdated but still adequate. Modern office equipment is scarce and there is lack of a good stock of technical literature. The internal models, forms and standards paper sizes need a complete revision.

- 2.06 The Authority is considered capable of performing the general administration of the project. Any possible present deficiency would be of greater importance to the next logical phase, that is the construction and operation of the recommended specific projects. It has to be understood that the deficiencies reviewed above are mostly due to the recent establishment of the Authority as a single body and the somewhat slow implementation of some of the measures for initial organization. These deficiencies serve to point up, however, the need for technical assistance, which is indeed the objective of the present project.

SECTION III. SIMILAR PROJECTS EXECUTED OR BEING EXECUTED

- 3.01 In the past, the different agencies, whose functions and responsibilities have now been integrated into the Authority, executed many projects of importance. At present, Trinidad is served by a number of interconnected water supply systems complemented by a small number of isolated rural systems. The general features of these systems are as follows:
- a) Sources of supply: Two impounding reservoirs of 5,260 million gallon (imperial) capacity; 80 wells; 6 river intakes. The total production amounts to 50 million gallons per day, 60% of which comes from ground-water resources. In addition to this, certain industrial concerns operate their own sources of supply, with an estimates production of 10 m.g.d.
 - b) Treatment: Practically all the water supplied undergoes some sort of treatment, ranging from simple disinfection with chlorine to complete treatment with precipitation, filtration and stabilization. There are four main treatment plants.
 - c) Transmission: There are about 200 miles of trunk mains. Pipe sizes range from 8" to 36". There are also over a dozen high-lift pumping stations.
 - d) Storage: There are approximately 50 service reservoirs with a combined capacity of over 37 million gallons. Tank capacity ranges from 10,000 gallons to 5 million gallons.

- e) Distribution: There are approximately 1,500 miles of distribution mains. Pipe sizes range from 2" to 8". Materials are cast iron, galvanized iron or P.V.C. Service is provided through house connections to about 30% of the population; another 65% of the population is supplied by means of public taps. Only 5% of the population is without any kind of pipe-borne supply.

- 3.02 The most recent construction phase culminated with the completion of the El Socorro and Navet Waterworks, in 1964 and 1966, respectively. Also, in 1966, sanitary sewer systems were completed to serve the areas of Port-of-Spain, San Fernando and Arima.

All these works were expertly planned and executed through various consulting firms and contractors. The financing was made through government grants, and a TT\$ 15,000,000 (US\$ 8,520,000) loan from the Export-Import Bank of the USA. The operation of the different units is very good. In the Port-of-Spain Levantille sewage treatment plant, for example, in addition to the routine operation, the Authority is performing research work on algae with some very promising preliminary results. The maintenance is also adequate. A good example is the Freeport treatment plant, kept in excellent conditions nine years after its completion. In the Arima and San Fernando sewage treatment plants as well as in the Navet water treatment plant, the electronic automatic equipment is developing some trouble that cannot be attributed to faulty maintenance. It seems that the organization and administrative problems that are now plaguing the Authority have not, as yet, made themselves felt too strongly in the actual work being performed in the field.

It has to be acknowledged that there is some talk of deteriorating service in the San Fernando distribution area since the Authority took over the actual administration of the city's services in 1967. To some extent it may be true, but, the important fact is that the Authority's responsible officials are aware of these shortcomings and willing to remedy every possible deficiency.

All systems in Trinidad are being utilized to the extent of their capacity. In many areas there is already severe scarcity of water. The increasing industrial needs are not being met. To keep pace with growing demand, water production has to be almost doubled to an estimated 85 million gallons per day by 1980.

In certain areas some benefit can be derived from appropriate waste control measures and this is one of the most important objectives of the proposed study. But there is an unquestionable need for the development of new sources of supply.

- 3.03 At present, an extensive project is being executed in Trinidad for the purposes of a Water Resources Survey. A firm of consultants has been engaged and the work is now past its first year. A network of gaging stations has been established and is in operation. A preliminary report has been issued. Although the survey is to serve multiple purposes, the Authority has most of the responsibility for its operation. The funds for the survey are included in the Authority's budget; the estimates for 1967 amount to TT\$ 400,000 (US\$ 235,000).

SECTION IV. ANALYSIS OF THE PROJECT

4.01 Preliminary Considerations

Since some years ago, the Authority's responsible officials have been giving attention to the problem of the preparation of a long term plan for the development of Trinidad's potable water supply. In 1964, the then chief technical officer, Mr. Ian de Verteuil, published an "Outline Report" on a development program, that has served as a basis for the proposals incorporated in the country's Second Five-Year Plan, 1964-1968.

In that report, two main projects were contemplated:

a) The Oropouche Project:

The waters of the northern Oropouche river (there is a southern Oropouche river) would be utilized in two steps, the first being a direct intake from the river and the second the construction of a dam that would create a large impounding reservoir. There are some preliminary studies made on this project. They have been examined and cannot be considered satisfactory as a basis for final engineering design. The consultants, presently engaged in the Water Resources Survey, expressed their opinion that by the end of 1967 they will have enough hydrological data available to support engineering design.

b) The Chickland Project:

This project contemplates the construction of a dam on the Couva river, not far from the present Freeport waterworks. The main advantage of this project is its closeness to the critical western region that includes the San Fernando distribution area and the large oil and petrochemical industrial complexes. There is a marked scarceness of basic data for the development of this project.

It must be said that the studies, plans and proposals for the above mentioned projects, as well as for the complementary and additional ones, have been restricted to the very preliminary and general considerations. The few specific estimates of capacity and cost are subject to probable extensive revisions, due to the scarceness of basic data previously collected and analyzed. It is even possible that a more detailed study might come out with new solutions or a different order of priorities.

Therefore, prior to any development work on these projects, a general study of the water supply problem in the country should be made and a general long-term program prepared to constitute a basis for the engineering design of specific projects.

4.02 Description of the Project

The technical assistance plan would consist, mainly, in securing expert consultants for the purpose of the formulation of a long-term plan for the development of potable water supply on a country-wide basis. An interim program should be formulated for the maximum efficient utilization on present assets. Assistance should also be given to the executing agency on matters of internal organization and administration.

The terms of reference for the consultants on water supply should follow the guideline expressed in Appendix No. I.

The consultants in organization and administration would present schemes for the internal organization of the executing agency in order to obtain the best possible conditions for the development of the expansion proposals.

4.03 Justification of the Project

The project is justified by the necessity for a general study of a long-term water supply development program. Any significant expansion of the present sources of supply will require considerable amount of funds (an estimated TT\$ 31,000,000 equivalent to approximately US\$ 18,600,000 for the first phase of Oropouche and Chickland projects). Investments of such magnitude cannot conceivably be made without the proper feasibility studies. Furthermore, the elaboration of a long-term program together with the organizational and administrative schemes envisaged will put in the hands of the Authority a powerful and necessary instrument for the development of its work and the benefit of all water users and, consequently, of the country.

4.04 Cost of the Project

Unlike a construction project, where the quality and quantity of the service to be performed can be expressed in definite numerical terms, the cost estimates for consultant's service is frequently subject to a large degree of uncertainty. On account of that, a contingency factor of about 15% was considered advisable. The preliminary cost estimates are summarized as follows:

1. Full time consultants	US\$ 175,000
2. Short terms consultants	22,000
3. Travel	15,000
4. Head office expenses	22,000
5. Contracts	78,000
6. WASA supporting services	50,000
7. Fees	18,000
8. Consultants for organization and administration	42,000
9. Contingencies	75,000
10. Inspection and supervision	3,000
Total Cost	<u>US\$ 500,000</u>

SECTION V. EXECUTION OF THE PROJECT5.01 General

The project is to be carried out in all its phases through contracts with consulting firms and/or professionals and technicians. The services of possibly two consulting firms may be needed in order to effectively carry out the studies for the water resources and supply plan as well as the organizational and administrative analysis, respectively. Consideration would also be given, however, to a single firm sufficiently qualified in both fields. The Authority will be in charge of the general administration of the project and will provide support and help when needed.

Nevertheless, it is estimated that a carefully selected firm of consultants will be able to produce by the second semester of 1968 enough engineering data on a single selected first priority project, to allow for the preparation of final engineering plans and the calling for bids for construction work. Also sufficient information would be available on the project as a whole, to allow the initiation of discussion with international lending institutions towards the financing of a construction project.

5.02 Disbursements

The disbursements will be made on a paripassu basis with the local contribution, according to the execution of the project. The US\$ 50,000 related to the Authority's supporting services to be supplied to the project could be credited on a monthly basis.

5.03 Procedures for Engaging the Consultants

The consultants should be engaged through direct negotiations, according to accepted international practices subject, evidently, to local legal limitations. The basic points of these procedures are:

- a) The engagement of the consultants should not be made through public biddings;
- b) A selected group of firms should be individually contacted and asked to discuss the project and present a plan of operations for its execution;
- c) The respective backgrounds and present conditions, the result of the discussions and the plans of operations presented for the execution of the project should constitute the basis for the listing of the firms according to their qualifications for this particular project;
- d) The best qualified firm would then be asked to present a definite proposal that would include costs.
- e) The proposal would be analyzed in its merits and a mutually satisfactory contract would be negotiated with the firm.
- f) In the event it is found impossible to reach an agreement on the fee or the contract terms, the first proposal should be discarded, and a written notice be given to the firm.
- g) Negotiations should then be initiated with the second firm in the list. This procedure would follow until agreement would be reached with one of the qualified firms.

5.04 Supervision of the Project

The executing agency is considered qualified to perform the selection of the consultants and supervise the execution of the project. It is recommended that the selection procedures and the supervision of the project, be assigned to groups or commissions of professionals formally appointed by the Authority, from its own staff.

A convenient number of preliminary reports will be required from the consultants in order to assure the Authority and also the Bank that the final project documents will be presented in accordance with the objectives of the project.

There is no need for the appointment of a project engineer. The technical supervision of the project by the Bank can be done by the engineers from headquarters.

SECTION VI. ADMINISTRATIVE AND FINANCIAL STRUCTURE

6.01 As mentioned before, the establishment of the Authority by the amalgamation of five different agencies caused a number of organizational and administrative problems, some of which have not yet been solved. These problems are reflected in the financial and accounting services of the Authority.

6.02 During the first two years of existence, the Authority has been unable to prepare representative financial statements. At the same time, it does not have, admittedly, an adequate code of accounts and accounting system. In order to remedy this situation, the services of a firm of consultants were retained for the purposes of preparing a new code of accounts, and drawing up convenient models for the balance sheet and profit and losses statements. These consultants were also supposed to prepare a simplified balance sheet relative to the 1966 fiscal year (the same as the calendar year) and make an evaluation of the agency assets.

The consultants have produced a first report on "Proforma Management Accounts and Accounts Code" that is being studied by the Authority, but the proposed system is not yet complete and needs to be revised in some of its sections.

It is expected that at the beginning of 1968 the Authority will be starting to implement the recommendations of the consultants on financial and accounting matters.

6.03 The only published financial information available are the budgets for the years 1966 and 1967. The main points of these estimates are as follows (in thousands of US\$): 1/

1/ At the rate of 1,7 TT\$ to 1 US\$.

	<u>1 9 6 6</u>	<u>1 9 6 7</u>
<u>Estimated Expenses</u>		
Personnel emoluments	1,156	1,312
Other charges	7,369	6,041
Extraordinary	430	147
	<u>8,955</u>	<u>7,500</u>
<u>Estimated Revenue</u>		
Water service	3,200	3,422
Sewerage service	717	727
Other	---	118
	<u>3,917</u>	<u>4,267</u>
<u>Estimated Deficit</u>	<u>5,038 (x)</u>	<u>3,233 (xx)</u>

- (x) Covered by government grant
 (xx) To be covered by government loan

6.04 An observation should be made on the conditions of the Authority's service revenue. The present rate structure has no direct relation with the cost of the service offered. Rates are based on the so called "annual ratable value" of the property according to the following percentages: general water rate: 7-1/2%; water service rate: 2-1/2%; sewerage rate: 5%.

The general water rate is charged to all properties in the different service areas. The water service rate is charged only to the properties actually served by means of a service connection. The sewerage rate is charged only to the properties actually served by the sewer systems. The base for the water rates, the annual ratable value (A.R.V.), is established by the Inland Revenue Department, Ministry of Finance. Its assessment is supposed to give a measure of the rental value of the property. The Authority has no control whatsoever over the A.R.V. assessment. Also, the rates to be applied have to be approved by the Public Utilities Commission.

This rate structure results in the following widely differing service charges (in US\$):

a) Minimum general water rate	0.56 per year (x)
b) Minimum water rate for house conn.	3.60 " " (xx)
c) Water rate charged to one of the Authority's engineers in 1967	120.00 " "
d) Water rate for a house rented by US\$ 250 per month	176.00 " " (xxx)

- (x) The minimum wage according to a "memorandum of agreement for government labour" is equivalent to US\$3.70 per day. But there are actual wages, especially in the rural areas, as low as US\$ 2.00 per day.
- (xx) The consumer agrees to pay no less than that.
- (xxx) In this case, the sewerage rate would be an additional US\$ 71 per year.

There are also a number of water meters mostly for industrial consumers. The rates charged for metered services cover, admittedly, only half of the actual cost of the water supplied.

- 6.05 For capital investment the Authority receives grants from the government. The following allocations were made for 1965 (2/), 1966 and 1967 (in thousands of US\$):

	<u>1 9 6 5</u>	<u>1 9 6 6</u>	<u>1 9 6 7</u>
Sewerage	3,920	3,058	588
Water	1,814	1,118	1,136
Accommodation	<u>7</u>	<u>29</u>	<u>188</u>
	<u>5,741</u>	<u>4,205</u>	<u>1,912</u>

It may be explained that: (i) the large allocations for sewerage in 1965/66 constitute part of the local contribution to the construction of the sewerage systems of Port-of-Spain (expansion and treatment works), San Fernando and Arima; (ii) the large allocation for accommodation in 1967 is destined mainly to the construction of the Authority's new head office.

- 6.06 The amounts and purpose of the principal loans owed by the Authority are as follows:

- a) Loan from the Export-Import Bank, USA, in the amount of TT\$ 15,300,000 (US\$ 9 million, approximately), for the construction of sanitary sewer systems for Port-of-Spain, San Fernando and Arima; the loan is to be repaid in 14 semi-annual installments, at 5-3/4% per annum interest. First payment was due in May 15, 1965.

2/ In this case, information for 1965 is available and represents actual expenditures.

- b) Financing of TT\$ 2,030,000 (US\$ 1,220,000, approximately), for reinforced concrete pipe, by the firm The Lock Joint Co., USA.
- c) Various loans totalling approximately TT\$ 180,000 (US\$110,000) from government and other sources, for general improvements in different systems.

Debt service for these loans is included in the Authority's budget. The figures for 1966 and 1967 are (in thousands of US\$):

	<u>1 9 6 6</u>	<u>1 9 6 7</u>
Export-Import Bank	1,765	1,696
Lock Joint Co.	225	217
Other	61	61
Total	<u>2,051</u>	<u>1,974</u>

A new factor in the debt conditions of the Authority has been introduced by the new government policy as to the operating deficits of the statutory boards like the Water and Sewerage Authority. Prior to 1967, the operational deficit used to be covered by a government grant. Starting in 1967 the government will make loans instead of grants for the financing of operational deficits.

PROPOSED TERMS OF REFERENCE FOR WORK ON A
WATER SUPPLY TECHNICAL ASSISTANCE PROJECT
FOR TRINIDAD AND TOBAGO

I. OBJECTIVES

This Project consists of studies of the current potable water situation in Trinidad and Tobago, projections of future requirements and recommendations for the improvement and expansion of the water systems and for improvements in the administration and organization of the Water and Sewerage Authority.

II. GENERAL INFORMATION

A general review of the features and conditions of Trinidad and Tobago, related to water supply and sewerage.

III. WATER RESOURCES

Examine and utilize existing information and studies including those being carried out at the present time, as related to the possible development of sources for potable water systems. The following subjects, considered of interest, are already included in the terms of reference of consultants presently engaged:

a) Rainfall data:

1. Agencies dealing with the collection and compilation of rainfall data.
2. Existing stations, location of same.
3. Available rainfall data (general).
4. General pattern of rainfall in Trinidad and Tobago.

b) Hydrological data:

1. Agencies dealing with the collection and compilation of hydrological data.
2. Available hydrological data (general).
3. General description of the main streams of possible consideration for a general potable water supply plan.

c) Hydro-geological data:

1. Agencies dealing with the collection and compilation of hydro-geological data.
2. Available hydro-geological data (general).
3. General description of the main ground water provinces or regions.

- d) Recommendations on such additional action required in the event the data available are insufficient.

IV. POPULATION STUDIES

Review data on population and population characteristics as a basis for estimating present and future demand for water. Subjects of interest:

- a) Agencies dealing with population statistics.
- b) Characteristics of population census; general census; regional census; interval between censuses.
- c) Census data available.
- d) Pattern of population distribution; trends.
- e) Population projections for the different areas of the country.
- f) Selected vital statistics, specially those related to water borne diseases.

V. GENERAL REVIEW OF EXISTING WATER SUPPLY

The existing water supply systems should be reviewed not only for information purposes but also for the evaluation of the possibilities of their improvement and their utilization in the general expansion program. Also the operating conditions of the existing system should be used as a guide for the establishment of the standards and requirements for expansion. The following subjects should be examined:

- a) Classification and list of the water supply systems serving the country.
- b) Detailed description of the major systems.
 1. General description of the systems - important dates.
 2. Name and location of the agencies or engineering firms that have participated in the design and construction of the system.
 3. Description of installations:
 - Source of supply: type, location, actual and possible yield, probable duration, quality of the water, property rights with regard to the source;
 - Intake: type, approximate date of construction, capacity;
 - Pumping: classification and location of pumping stations, power used for pumping, types of pumps, capacity and working conditions;
 - Transmission: classification and location of the transmission lines, approximate date of installation, materials, diameter, lengths and capacity;
 - Treatment: type of treatment, description of the plant, capacity, operation conditions, water quality;
 - Distribution: type of network, extension, diameters, materials, available pressures, area served as a percentage of the total area;
 - Storage: type of tanks, capacity;
 - Connections: number and diameter with percentage of connections, classification of consumers, metered and unmetered connections, other controlling devices; population served by house connections, public fountains, etc., with percentages of the total population.
 4. Study of the operation of the systems: administration, maintenance, total and per capita water consumption.
 5. Rates: rates structure, relation to wages; charges for connection, for meter installations and other; authority for establishing the rates.

6. Current sources of revenue: revenue from rates; percentage of total revenue, service charges, percentage of total, other sources of income.
7. Current expenditures: operation and maintenance, debts.
- c) Existing projects, plans or studies being carried out; review, summary and updating of existing available reports.
- d) Examination of existing documentation on sewerage. Present a brief description of the existing systems in the final report, including the installations, performance, present problems and recommendations.

VI. WATER NEEDS

A study of the present and future water needs of Trinidad and Tobago. Make recommendations concerning:

- a) The areas that should be considered as units for the purpose of water supply.
- b) Present and future estimated demand for each area.
- c) Estimates industrial needs and sources for present and future.

VII. MAIN RECOMMENDATIONS

A. LONG-TERM PROGRAM

The long-term program shall be designed to meet the industrial and domestic water needs of the country for the next 25 years at least. The study shall cover: general objectives and criteria, types of service to be provided or developed, the amount of water to be supplied, sources of supply to be developed, treatment proposals, transmission, storage, pressure zones, preliminary designs, schematic plans, construction programming, foreign and local costs, financing, institutional requirements. The program should include clearly defined stages and an economical order of priority for their development.

B. FIRST STAGE PROGRAM

The first stage of the long-term program should be elaborated in sufficient detail to allow for reasonable cost estimates, to form a basis for final engineering plans and to support possible negotiation for financing. It will cover the needs of the country for a period not shorter than ten years. A review of the Oropouche and Chickland projects will be made. Attention should be given to the following subjects:

1) Review of the Croupouche Project:

Both the proposed first and second phases of the project should be examined.

a) First Phase - Direct Intake from the river

Estimates of yield; location of the intake structure; preliminary design of the intake structure; type, size and number of units of the pumping equipment, and preliminary design of the pumping station; justification of the proposed treatment, location and preliminary design of the treatment plant; location, size, profile, length and materials of the transmission lines; recommendation as to the feasibility and convenience of the execution of this phase;

b) Second Phase - Impounding Reservoir

Estimates of probable yield on a continuous basis; location of the dam; specifications as to the type of structure, general dimensions and preliminary design; general characteristics of the reservoir; drainage area, surface area, volume, maximum depth, usable volume, etc.; preliminary design of the spillway and the intake structure; justification of proposed treatment, location and preliminary design of the treatment plant; location size, profile, length and materials of the transmission lines; recommendations as to the feasibility and convenience of the inclusion of this project in the first phase of the general plan.

2) Review of the Chickland Project:

Attention should be given to the same points mentioned above for the impounding reservoir of the Croupouche Project.

3) Other Sources:

Other sources to be developed and/or alternatives to the above mentioned projects as the case may be. A study of the possibilities of the Caroni river as a source to the Port-of-Spain area should be made; if found feasible, the elaboration of the study, plans and recommendations should meet the requirements stated in other sections of these terms of reference and in particular in (1) above, with additional emphasis on the effect and control of expected industrial and other waste discharge upstream from the intake.

4) General Transmission and Major Distribution Network:

Flow diagrams will be presented for the general network of transmission lines interconnecting the sources of supply or treatment works with the distribution reservoirs and the different local distribution areas. All the typical conditions of flow will be investigated. The plans will establish the location of every line; pipe materials; sizes; lengths; profiles; etc. Valves and other controls, relief and protection devices will be indicated and specified; location and capacity of the existing and proposed reservoirs, booster stations, etc., will be given.

5) Hydrological Studies:

For each of the proposed projects, review and update the existing hydrological studies; perform new studies as required.

6) Topographical Studies:

Review the information available; perform all topographical studies necessary for the presentation of the first phase of the general program, as specified.

7) Soil Investigations:

Review available information; perform additional investigations as required.

8) Design Criteria:

State and justify the adopted criteria as to the type of service, domestic consumption, variation of consumption, zoning, fire-fighting, industrial requirements, maximum and minimum pressure, metering, etc.; also as to the conditions of flow in pipes, channels, etc.; also as to other pertinent matters.

9) Standards and Specifications:

All standards and specifications adopted should be identified and listed. The applicability of the same to the conditions of Trinidad and Tobago should be ascertained.

10) Plans:

Prepare and present all the plans, maps, reports, etc., in the standard form accepted by the Water and Sewerage Authority.

11) Construction Programming:

A schedule for the construction should be presented.

12) Costs:

Estimates will be presented for every project. The breakdown of the estimates should include: cost of the additional studies and technical work deemed necessary; cost of final engineering plans; cost of supervision; cost of shop organization; direct and indirect costs of every major item of the project (i.e. dam, intake works, pumping station, treatment plant, transmission lines, etc.); subdivision of cost of each item (i.e. for transmission line: field clearing and layout works; excavation and fill; pipes, fittings, valves, etc.; laying of pipes, etc.; anchor blocks, bridges and special structures, etc.).

13) Terms of Reference for the Final Plans:

Terms of reference will be presented for the work necessary for the preparation of the final engineering plans. These terms of reference should specify in detail every piece of field work that will be necessary and all the documents and plans that should comprise the final engineering project.

14) Additional Work:

Specific recommendations should be made as to additional studies, investigations and technical work required.

15) Loan Applications:

Prepare loans applications, as authorized, to international lending institutions for those projects selected for execution during this first stage program.

C. INTERIM PROGRAM

For the full and effective utilization of existing facilities, an interim program shall be recommended for immediate execution. This program shall be designed to serve as a complement and, if so recommended, temporary alternative to the implementation of the long-term program and first stage program. The study will include scheduling and budgeting requirements for the execution of the interim program, and shall take into account, in particular, the following points:

1. Review of the operation of the existing water systems to establish capacity of the various assets and identify areas of scarcity;

- 2) Recommend improvements to the existing systems, i.e., plant efficiency, yield, service reservoirs, system controls, pressure zoning;
- 3) Recommend additions of sources and systems;
- 4) Make an extensive study of waste and losses of water through the systems. Study the pattern of consumption on each zone. Present specific recommendations as to waste and losses control measures. Consider the effect of these measures on the long-term program and its first stage;
- 5) Present a complete plan for a metering program, in connection with recommendations for the establishment of a realistic revenue producing rate structure and rate setting procedure. The economic impact of this program on the various strata of the population should be evaluated. The metering program should contemplate as a first phase a selective metering scheme to encompass, from the beginning, all the "large consumers", industrial, commercial and residential, and in order to allow for a substantial proportion of the water distributed to be accounted for;
- 6) Analyze unit costs for present operations;
- 7) Prepare financial projections to include cash flow and working capital requirements;
- 8) Recommend measures for strengthening the institutional structure of the Authority and improving its organization and administration so as to enable it to better carry out the recommendations of the interim program and fulfill the objectives of the first stage of the eventual expansion program. In this respect, particular attention should be given to the following:
 - a) Review and evaluate the recent recommendations for accounting and financial improvements and their implementation (including the valuation of assets);
 - b) Study purchasing and bidding procedures, the system for payments to suppliers, and control of inventory, machinery and equipment;
 - c) Study and recommend measures for the provision and training of a suitable administrative and technical staff.
- 9) Studies and recommendations on the application of an adequate system of water rates and the collection of revenue, to be initiated within the interim program.

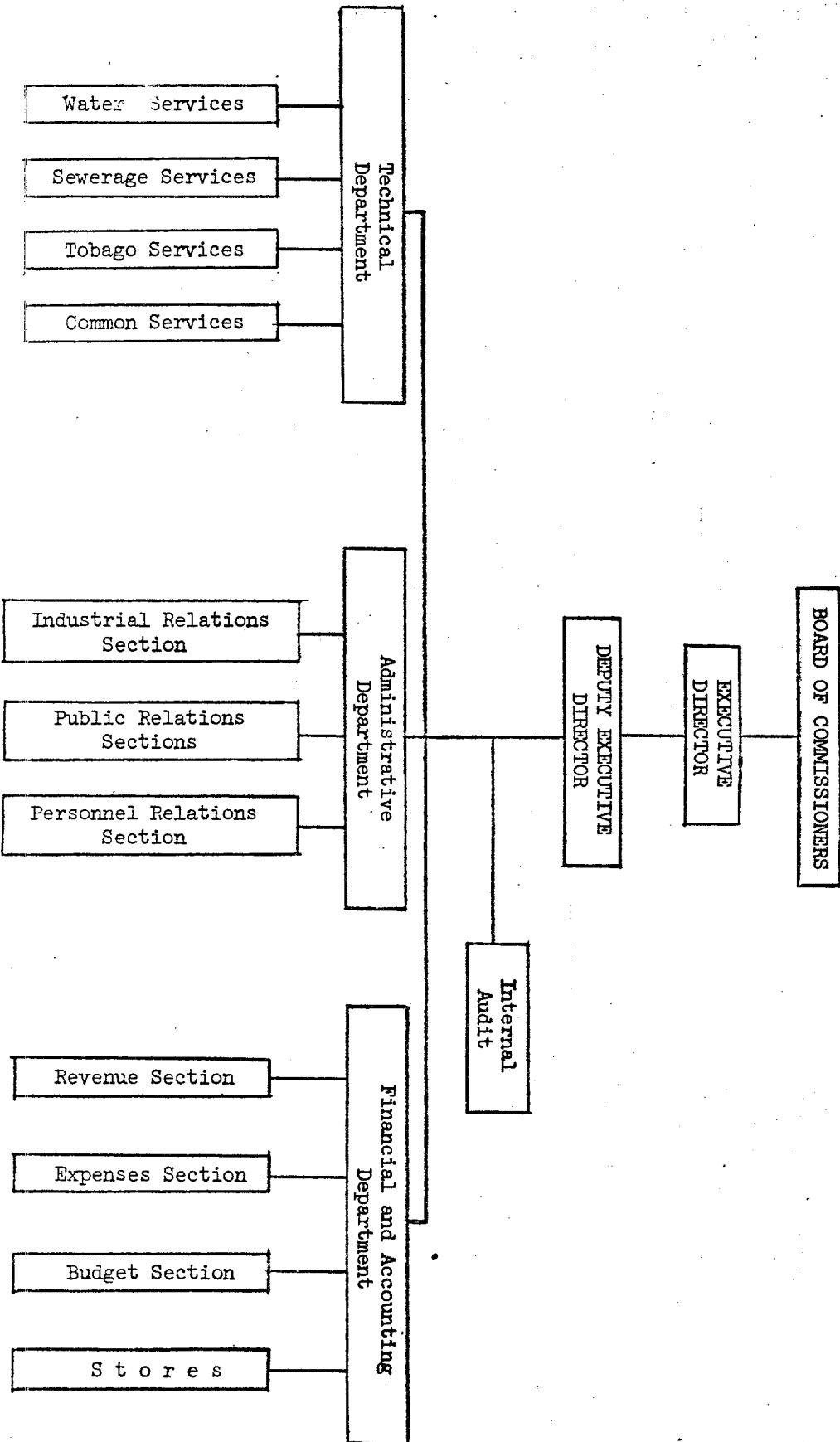
VIII. REPORTS

Reports will be presented, to the Authority and the Bank for every important phase of the work. Special reports may be requested by the Bank and/or by the Authority, whenever needed. The regular reports will be, at least, the following:

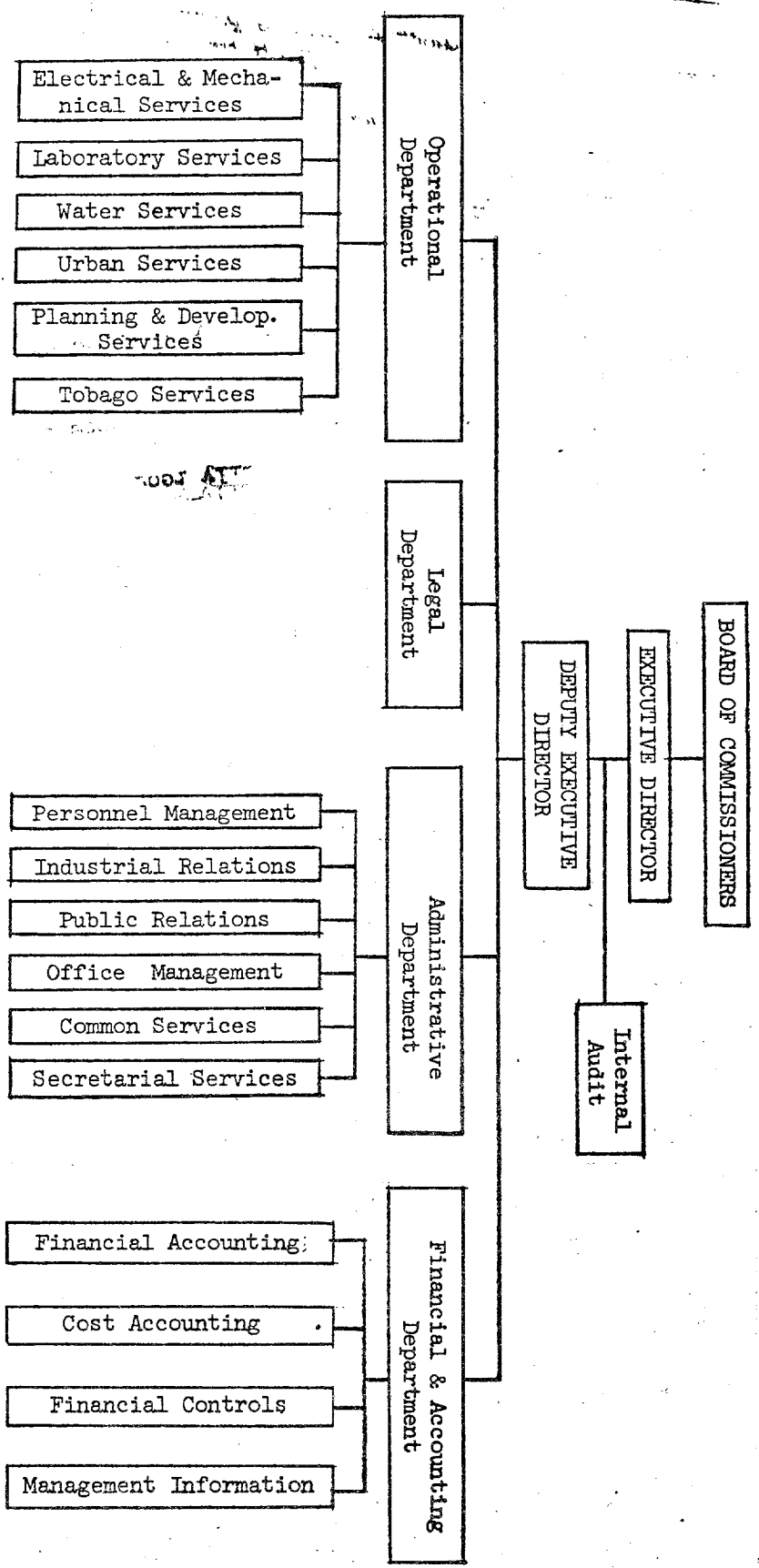
- a) Preliminary report on the long-term plan.
- b) Final report on the long-term plan.
- c) Preliminary report on the first phase plan.
- d) Final report on the first phase plan.
- e) Report on the interim program.
- f) Report on organization and administration.

The preliminary reports should be submitted for review and approval according to an agreed upon schedule. Based on this review decisions will be made as to what phases of the contemplated plans and projects will be included in the final reports.

TRINIDAD AND TOBAGO
WATER AND SEWERAGE AUTHORITY
ORGANIZATION CHART (SEPT. 1967)



TRINIDAD AND TOBAGO
WATER AND SEWERAGE AUTHORITY
PROPOSED ORGANIZATION CHART (x)



(x) Proposed by the Organization and Methods Division, Ministry of Finance.

ANNEX II

TRINIDAD Y TOBAGO - Préstamo de Asistencia Técnica para agua potable

El análisis de la situación económica actual y de las perspectivas de desarrollo de Trinidad y Tobago, reiterado por las observaciones realizadas en la reciente reunión del CIAP, indica que el país ha incurrido en dificultades crecientes para recobrar el ritmo de desarrollo que experimentó hasta 1962. Se ha constatado que, a los efectos de la caída en los precios internacionales de los productos petroleros, se han sumado, desde esa fecha, el deterioro de las exportaciones de los productos agrícolas tradicionales del país aunque otras exportaciones han crecido y el aumento de los gastos públicos, consecuente a la expansión de las funciones del Gobierno, advenidas con la independencia.

La extrema dependencia en que el país se encuentra de las actividades relacionadas con el petróleo, que generan más de un 55% del valor agregado de sus exportaciones y la baja productividad de sus cultivos tradicionales, asociados a otras causas, han resultado en una alta tasa de desempleo, estimada en cerca de un 15% de la fuerza de trabajo.

Esas condiciones de la economía del país han llevado a que se estime de máxima prioridad la diversificación de las actividades económicas, que el Gobierno de Trinidad y Tobago propone como su meta principal de desarrollo para los próximos años. Se planea que ese esfuerzo de diversificación se deba de llevar a cabo, tanto respaldándose una reestructuración de la agricultura del país, como impulsando su desarrollo industrial. En ambos casos, el esfuerzo de desarrollo estará asociado a una modificación estructural en el uso de los factores de la producción, principalmente a un cambio en la disposición de las unidades de producción en el territorio.

Esos dos factores -el desarrollo agrícola y el industrial- y el crecimiento demográfico deben con toda probabilidad, alterar la demanda actual de agua, no sólo en su cantidad, como en su distribución. De ese modo resulta inadecuado considerar el suministro actual de agua en el país solamente en relación con la tendencia histórica de la demanda por ese bien.

En la primera fase de los esfuerzos de diversificación e intensificación de la actividad agrícola que el país está emprendiendo y que incluye un aprovechamiento de las tierras de la Corona, se incorporarán a cultivo 20.000 acres (8.000 hectáreas) hasta fines de 1968. Al progresar ese programa

aumentan las necesidades de agua para las habitaciones rurales y para animales, además de las necesidades de agua para riego.

Pero, aún si se toma como base para comparación el simple crecimiento demográfico, se observa que ese crecimiento -de un 3% al año- determina necesidades rápidamente crecientes de habitación, que se traducen en un cambio considerable en la demanda actual. En ese sentido, cabe anotar que las necesidades de viviendas adicionales han sido burdamente estimadas en unas 60.000 unidades. Además, un 30% de la población recibe agua por conexiones directas, mientras que los demás 65% se abastecen de fuentes públicas. Los otros 5% de la población no dispone de ningún suministro adecuado de agua potable.

Las informaciones disponibles sobre la situación actual del suministro de agua en Trinidad indican la necesidad de la ampliación del sistema actual. Pero el aprovechamiento de las principales fuentes conocidas -Oropouche y Chickland- requiere inversiones del orden de los TT\$ 31 millones. Por otra parte, la reciente fusión de los cinco sistemas que operaban en la isla demanda una consolidación de los servicios de administración y manejo del sistema, que todavía no se ha logrado por completo. Esos antecedentes y la necesidad de disciplinarse a un programa de las inversiones en ese sector, hacen necesaria la realización de un estudio de factibilidad que determine:

- a) El suministro adicional que se puede obtener de las fuentes conocidas -básicamente Oropouche y Chickland-.
- b) Las posibilidades de mejoramiento de la red existente, de modo de obtener mejor rendimiento del sistema y de su expansión.
- c) Las modificaciones y mejoramientos que se hagan necesarios en la administración y manejo del sistema.
- d) Un programa de expansión del sistema en su totalidad que permita ajustar las inversiones que se realicen en ese sector al crecimiento de la demanda. Dicho programa debe considerar, el cambio en la composición de la demanda, que resultará de los programas de desarrollo agrícola e industrial, ahora bajo consideración.

El programa de inversiones que resultará de dicho estudio se ajustaría a la prioridad expresada por el Gobierno de Trinidad y Tobago, de realizar las obras de infraestructura social y económica que demuestre necesarias a su esfuerzo de diversificación agrícola e industrial, necesario al desarrollo del país.

LEGAL REPORTI. BACKGROUND

This proposed loan to Trinidad and Tobago will be the first loan to this new member of the Bank. Accordingly, it is desirable to discuss the legal background of this country in general terms.

Trinidad and Tobago obtained independence in 1962 through the enactment by the British Parliament of the Trinidad and Tobago Independence Act of 1962. It is a member of the Commonwealth of Nations. In 1962, Queen Elizabeth II issued an Order in Council under the authority of the West Indies Act of 1962,^{1/} adopting a constitution for Trinidad and Tobago.

Trinidad and Tobago has a parliamentary form of government under the general direction and control of a cabinet, itself collectively responsible to the Parliament.^{2/}

The titular or nominal executive power is vested in Queen Elizabeth II and is exercised on her behalf, subject to the provisions of the Constitution, by a Governor-General appointed by the Queen.^{3/}

Parliament consists (apart from Her Majesty, the Queen) of a Senate, the upper chamber, the members of which are appointed, under specific provisions of the Constitution as to persons qualified for appointment, by the Governor-General, and a House of Representatives, the members of which are freely elected by the electorate of Trinidad and Tobago.^{4/}

The Cabinet is composed of a Prime Minister, who is appointed by the Governor-General, and who normally is the leader of the majority party in the House, and an unspecified number of other ministers who must be members of the House of Representatives or of the Senate, similarly appointed by the Governor-General, with, however, the advice of the Prime Minister. ^{5/}

^{1/} Trinidad and Tobago (Constitution) Order in Council, 1962.

^{2/} Constitution, Article 57; Article numbers in footnotes refer to Articles of the Constitution.

^{3/} Article 56; The appointment of the Governor-General is customarily made upon advice of the Prime Minister.

^{4/} Articles 22, 23 and 29.

^{5/} Articles 57 and 58.

The Trinidad and Tobago Constitution, except for restrictions on the power of Parliament to enact certain laws, for example abrogating or infringing what are commonly called "Human Rights" and "Fundamental Freedoms", may by its own provisions be "altered" by an Act of Parliament. 1/ Amendments of certain other provisions of the Constitution also require the affirmative vote of a specific number of Representatives and Senators in excess of a majority. 2/ The balance of the Constitution may be amended by simple passage of an Act of Parliament.

II. THE BORROWER

Capacity to Borrow from the Bank - Requirements for Signing Loan Contract.

The Constitution does not contain any specific reference to, or requirement for, the borrowing of funds from sources external to Trinidad and Tobago. Section 48 of the Constitution, however, defines a "Money Bill" as any bill which relates, inter-alia, to "...the raising or guarantee of any loan or the repayment thereof,..." thus, apparently imposing a requirement on the Government to secure authorization by way of an Act of Parliament prior to obtaining any loan and thus effectively, prior to the signing of a loan contract. Accordingly, Trinidad and Tobago may not, without this authorization of Parliament, enter into a loan contract with the Bank.

The Legal Department has been informed, however, that a bill has been, or is about to be, introduced in the House of Representatives 3/ which would in effect "alter" this requirement insofar as loans from this Bank are concerned. The provisions of this Draft Act, if enacted, will authorize the Government of Trinidad and Tobago

"...in such manner and on such terms and subject to such conditions as may be agreed with the Bank, to borrow or

1/ Article 38
2/ Article 38
3/ Referred to hereinafter as "Draft Act"

- 3 -

guarantee the borrowing of, from the Bank from time to time such sum or sums as may be required for the purpose of financing or promoting economic development in Trinidad and Tobago...." 1/

The enactment of this general legislation will obviate the necessity to secure specific authorization from Parliament for future borrowings.

Other Requirements for Legislation

Section 85 of the Constitution establishes the requirement that "...all revenues or other money raised or received by Trinidad and Tobago... shall, unless Parliament otherwise provides, be paid into and form one Consolidated Fund." This section further provides that "...No moneys shall be withdrawn from the Consolidated Fund except to meet expenditure that is charged upon the Fund by... any Act of Parliament or where the issue of those moneys has been authorised by an Appropriation Act...."

Thus, unless the authorizing legislation, i.e. the "Money Bill", specifically authorizes the appropriation of funds, loan disbursements theoretically would have to be paid into the Consolidated Fund, and an Act of Parliament would be required to appropriate funds for the end purpose of the loan. In the absence of general legislation, this in effect would entail post-signature approval of the terms of the loan contract by Parliament.

Furthermore, the "Money Bill" section of the Constitution cited above refers to the repayment of loans, and this provision, together with the provision relating to the payment of moneys out of the Consolidated Fund, indicates that a specific Act of Parliament would be required for the Government of Trinidad and Tobago to make interest payments and to repay the loan principal to the Bank.

These two requirements have been taken into account in the Draft Act granting the Government of Trinidad and Tobago general powers to borrow from this Bank. Thus, it specifically states that

"Any sums borrowed or guaranteed under the authority of this Act shall be applied and are hereby appropriate to the purposes for which they were so borrowed or guarantee as specified in the loan agreement in respect of such sums."

thereby obviating the necessity for a specific appropriation Act of Parliament. Section 4 of the Draft Act provides that

"All amounts required for the repayment of sums borrowed or guaranteed by the Government of Trinidad and Tobago under the authority of this Act and for the payment of all interest and other charges on such sums shall be a charge upon and payable out of the Consolidated Fund."

Consequently, no further legislative action would be required to authorize repayment of the loan principal, interest, etc. by the Government of Trinidad and Tobago.

It is to be noted, however, that there is a requirement that the signed loan contract "...be laid before Parliament within thirty days of the conclusion of such agreement...." The Legal Department has been informed that this provision requires the Government to inform Parliament of the signing of such loan contract and does not entail legislative approval.

III. EXECUTING AGENCY

Background

The proposed executing agency is the Water and Sewerage Authority created by Act of Parliament in 1965 as a "body corporate". 1/ Four existing water and sewerage operating entities were merged into the new Authority. 2/

- 1/ The Water and Sewerage Act, 1965 (hereinafter referred to as the "Water Act") Section 3
2/ Water Act, Section 11

- 5 -

The Authority is established to carry out "...the policy of the Government in relation to water and sewerage..." 1/ and is required in "...the exercise and performance of its functions, powers and duties... [to] ...act in accordance with any special or general directions of the Government, given to it by the Minister [of Public Utilities]." 2/

From information available to the Legal Department at this time, it would appear that certain actions of the Authority, including appointment and dismissal of personnel, acquisitions and contracts over a certain value, are subject to approvals of other agencies of the Government.

The Authority is governed by seven commissioners appointed by the Governor-General, of whom three represent the Ministry for Agriculture, the Ministry for Health, and the Ministry for Local Government, respectively, and four are public members. The chief executive officer of the Authority is its executive director, who is responsible for carrying out the decisions of the Authority. He may be a commissioner.

Capacity to Carry Out the Project

The Authority has ample specific and general powers to undertake a study of the nature contemplated by the project. The Water Act authorizes the Authority, "...as required by the Minister [of Public Utilities]..." to carry out surveys of existing and potential future water demand of Trinidad and Tobago, to prepare estimates for future water supply requirements and to formulate proposals for meeting such requirements. 3/ The Authority has the general responsibility for maintaining and developing water systems and promoting conservation and proper use of water resources and supply. 4/ Furthermore, in

"...the performance of its functions and duties and in the exercise of its powers the Authority may do all things that may be necessary or expedient to secure the advantageous execution of the purposes of the Act".

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- | | |
|-----------|-----------------------|
| <u>1/</u> | Water Act, Section 9 |
| <u>2/</u> | Water Act, Section 10 |
| <u>3/</u> | Water Act, Section 45 |
| <u>4/</u> | Water Act, Section 42 |

- 6 -

Thus, the Authority has full legal capacity to undertake the proposed project.

Tariffs

In view of the fact that this proposed loan contemplates a study of the water supply system and not the construction or operation of such system, it is unnecessary to review in depth the legal provisions relating to franchises, agreements with local bodies, purchase of right of way or granting of easements, establishing tariffs and collection of revenues. However, in view of the central and important role tariffs play in the operation of a water supply entity, it is desirable to briefly discuss the tariff question in context of this proposed loan.

The Authority has the authority, apparently subject to possible direction by the Government, 1/ to establish tariffs for the supply of water. Section 26 of the Water Act requires the Authority to "...so exercise and perform its functions as to ensure that its revenues are not less than sufficient to -

- (a) pay installments of compensation required.../for transfer of property to the Authority/;
- (b) cover operating expenses, including taxes, if any, and to provide adequate maintenance and depreciation, and interest payments on borrowings;
- (c) meet periodic repayment on long term indebtedness to the extent that any such repayment exceeds the provisions for depreciation; /and/
- (d) create reserves for the purpose of future expansion;"

Therefore, the Authority is obliged to follow a tariff policy essentially similar to that normally required by the Bank.

1/ See paragraph 17, supra

IV. CONCLUSION

1. Given the language of the Constitution, the Government of Trinidad and Tobago is not presently authorized to borrow funds without specific authorization by Act of Parliament. However, if the Draft Act authorizing the Government to generally borrow from this Bank is enacted, the Government will have this legal capacity without the necessity to resort to specific legislative action in connection with a given loan.
2. Other legislative action is required under the Constitution, as specified in the second and third paragraphs under Other Requirements for Legislation above. These requirements, however, will also be satisfied by passage of the Draft Act.
3. The executing agency, Water and Sewerage Authority, has full legal capacity to undertake the project.