

Document of
The World Bank
FOR OFFICIAL USE ONLY

Report No. 6311

PROJECT COMPLETION REPORT

BOTSWANA

SECOND WATER SUPPLY PROJECT

(LOAN 1763-BT)

June 26, 1986

Water Supply and Urban Development Division
Projects Department
Eastern Africa Regional Office

This document has a restricted distribution and may be used by recipients only in the performance of their official duties. Its contents may not otherwise be disclosed without World Bank authorization.

UNITS AND MEASURES

1 mm	= millimeter	= 0.04 inches
1 cm	= centimeter	= 0.39 inches
1 m	= meter	= 3.28 feet
1 km	= 1,000 meters	= 0.62 miles
1 m3	= cubic meter	= 264 US gallons
1 l	= litre	= .001 cubic meters
1 kl	= kilolitre	= 1 cubic meter
1 ml	= megalitre	= 1000 cubic meters

Fiscal Year ends March 31
Currency = Pula = US\$0.9 1/
1 Pula = 100 Thebes

Abbreviations

WUC = Water Utilities Corporation
DWA = Departement of Water Affairs
BCL = Bamangwato Concessions Ltd.
(copper mining corporation)

1/ Rate of exchange in February 1984 when Project Completion Report calculations drafted.

June 26, 1986

MEMORANDUM TO THE EXECUTIVE DIRECTORS AND THE PRESIDENT

SUBJECT: Project Completion Report on Botswana - Second Water Supply Project (Loan 1763-BT)

Attached, for information, is a copy of a report entitled "Project Completion Report on Botswana - Second Water Supply Project (Loan 1763-BT)" prepared by the Eastern Africa Regional Office. Further evaluation of this project by the Operations Evaluation Department has not been made.

A handwritten signature in black ink, appearing to be 'A. P. ...', is written over the right side of the page.

Attachment

PROJECT COMPLETION REPORTBOTSWANASECOND WATER SUPPLY PROJECT
(LOAN 1763-BT)TABLE OF CONTENTS

	<u>Page No.</u>
Preface.....	1
Basic Data Sheet.....	ii-iii
Highlights	iv
 <u>PROJECT COMPLETION REPORT</u>	
I. INTRODUCTION.....	1
The Sector.....	1
Banks Involvement in the Sector.....	2
II. PROJECT PREPARATION AND APPRAISAL.....	2
Origin.....	2
Preparation, Appraisal, Negotiation and Approval.....	3
The Project's Role in the Long-Term Plan.....	3
Project Description.....	4
Covenants.....	4
III. PROJECT IMPLEMENTATION, OPERATION AND COST.....	5
Effectiveness and Project Start-up.....	5
Revisions.....	6
Implementation Schedule.....	6
Procurement.....	7
Costs and Disbursements.....	7
Operations.....	8
Performance of Consultants, Contractors, Suppliers and Borrower.....	8
IV. OPERATING PERFORMANCE.....	9
Market.....	9
V. FINANCIAL PERFORMANCE.....	10

TABLE OF CONTENTS (Cont'd)

	<u>Page No.</u>
Income Statements.....	11
Balance Sheets.....	12
Source and Application of Funds.....	12
Economic Rate of Return (ERR).....	12
Convenants.....	13
VI. INSTITUTIONAL PERFORMANCE.....	13
Management and Organization.....	13
VII. PROJECT JUSTIFICATION.....	14
Project Achievements.....	14
Least-cost Alternative.....	14
VIII. BANK PERFORMANCE.....	14
General.....	14
Supervision.....	15
Working Relationships.....	15
IX. CONCLUSIONS.....	15

ANNEXES

1. Project Cost Estimated/Actual.....	17
2. Disbursements Estimated/Actual.....	19
3. Financial Results Francistown Undertaking.....	20
4. Tariff Schedules (all areas).....	23
5. Rate of Return Calculation.....	24
6. Letter of Water Utilities Corporation, dated June 12, 1986.....	25

BOTSWANA

SECOND WATER SUPPLY PROJECT - LOAN 1763-BT

COMPLETION REPORT

PREFACE

This is a report on the completion of the Second Water Supply Project in Botswana, for which a Loan 1763-BT of US\$4.4 million equivalent was approved in October 1979. The borrower was the Government of Botswana which relented the proceeds of the loan to the Water Utilities Corporation (WUC) which was responsible for implementing the project. The loan was closed 18 months late in June 1984. There were no major cancellations.

The report was prepared by the Water and Urban Development Division of the East Africa Region Projects Department on the basis of the findings of a mission to Botswana in January 1984, documents contained in the regional files and a draft completion report prepared by the WUC and its consultants. At the time of the initial PCR preparation mission, the project had been substantially complete for 18 months and had been in operation for about 21 months. Loan closure was delayed to enable WUC to seek reimbursement of retention monies due to contractors who were required to complete some remedial works found to be necessary during the maintenance period, and which had been extended for this purpose.

In accordance with the revised procedures for project performance audit reporting, this Project Completion Report was read by the Operations Evaluation Department (OED), but the project was not audited by OED staff.

Following standard procedures, OED has sent copies of the draft report to the Government and the Executing Agency for comments. WUC's comments are attached to this report, see Annex 6 and reflected in the respective parts of the report.

BOTSWANA

SECOND WATER SUPPLY PROJECT - LOAN 1763-BT

PROJECT COMPLETION REPORT

BASIC DATA SHEET

Item	Appraisal Expectation	Actual or Current Estimate
Total Project Cost (US\$ million)	6.3	6.7
Overrun (%)	--	6.4
Loan Amount (US\$ million)	4.4	4.4
Disbursed	4.4	4.4
Cancelled	nil	nil
Date Physical Components Completed	01/01/82	08/31/82
Project Completion by above date %	80	99.9
Proportion of time overrun %	--	24
Economic Rate of Return	11.0	11.7
Financial Performance		Better than expected
Institutional Performance		Good, as expected

OTHER PROJECT DATA

Item	Original Plan	Revision	Actual or Estimate
First Mention in Files	--	--	01/18/78
Government Application	5/78	--	5/78
Negotiations	--	--	9/79
Board Approval	--	--	10/23/79
Loan Agreement Date	--	--	01/09/80
Effectiveness Date	05/08/80	07/31/80	--
		09/30/80	09/18/80
Closing Date	12/31/82	06/30/83	06/30/84
Borrower	The Botswana Government		
Executing Agency	Water Utilities Corporation		
Fiscal Year of Agency	March 31		
Follow-on Project Name	Third Water Supply Project		
Loan Number	2333-BT		
Amount (US\$million)	22.0		
Loan Agreement Date	07/07/83		

BASIC DATE SHEET (Cont'd)

<u>MISSION DATA</u>					
<u>Item</u>	<u>Month/ Year</u>	<u>No. of Weeks</u>	<u>No. of Persons</u>	<u>Manweeks</u>	<u>Date of Report</u>
Reconnaissance/ Identification	8/78	0.2	1	0.2	09/08/78
Preappraisal	11/78	1.0	2	2.0	12/26/78
Appraisal	2/79	3.0	3	2.0	03/09/79
Post-Appraisal	7/79	<u>1.0</u>	<u>2</u>	<u>2.0</u>	08/09/79
Total		<u>5.2</u>		<u>13.2</u>	
Supervision I	Jan. 1980	0.5	1	0.5	05/29/80
Supervision II	Sept. 1980	1.0	1	1.0	10/22/80
Supervision III	Apr. 1981	1.0	1	1.0	06/22/81
Supervision IV	Sept. 1981	1.0	2	2.0	12/08/81
Completion Report	Jan. 1984	<u>2.0</u>	1	<u>2.0</u>	
Total		<u>5.5</u>		<u>6.5</u>	

COUNTRY EXCHANGE RATES

<u>Name of Currency</u>	<u>Pula (P)</u>
Appraisal Year Average (1979)	US\$1 = P 0.789
Intervening Years average (1980--1982)	US\$1 = P 0.875
Completion Year (1983)	US\$1 = P 1.097

BOTSWANA

SECOND WATER SUPPLY PROJECT - LOAN 1763-BT

PROJECT COMPLETION REPORT

HIGHLIGHTS

The project has met all its objectives and has provided Francistown, the second largest town in Botswana, for the first time in many years with a reliable supply of unpolluted water which is expected to be adequate to meet the towns needs until about 1992. By doing this it has also provided the Government with the opportunity to divert new industries from Gaborone where there is an acute water shortage and in this respect has exceeded the original objectives (para. 4.04). Previous urban development and water loans and credits contributed to the preparation and development of the project (para. 1.04 to 1.06).

The financial results which are better than expected, have demonstrated the consumers willingness to pay a high price for quality and service in the country where water is at a premium (para. 4.01). The appraisal report underestimated the demand, mainly because of the lack of data regarding past consumption and other statistics on which to base estimates (para. 2.07).

Completion of the project is a further step in establishing the Water Utilities Corporation as an efficient autonomous state enterprise, operating on commercial lines. Management is however dependent on expatriates who occupy the top 20 posts. The lack of an adequate pipeline of local professionals in training to replace the expatriates represents a potential danger of deterioration in management efficiency if expatriates cannot be found in adequate numbers in the future (para. 6.01 to 6.03).

The Bank's performance demonstrates the disadvantages of excessive interference in the details of project design. In this case the Bank's intervention caused needless delays for estimated marginal savings in costs which may not materialize in the long run (para. 3.05). Final costs were 15.2% above the appraisal estimates in terms of local currency (6.4% in US\$) which was low in relation to inflation rates in Southern Africa at that time (para. 3.10).

BOTSWANA

SECOND WATER SUPPLY PROJECT - LOAN 1763-BT

PROJECT COMPLETION REPORT

I. INTRODUCTION

The Sector

1.01 Most of Botswana is desert and 90% of the population is concentrated in a relatively narrow strip along the eastern border. Although there are substantial supplies of good quality water in the Okavanga River in the sparsely populated north, and lesser quantities in the border rivers of the east, the country is generally water deficient. Of the population of about 750,000 in 1978, about 160,000 or 21% were concentrated in five principal towns, substantially all of whom had access to public water supplies. In addition many villages, had public supplies provided by District Councils with help from the Ministry of Works and the Ministry of Local Government and Lands. The Government's Fourth Development Plan 1976/77 to 1980/81 contained water supply schemes for 117 villages which raised the proportion of rural population having access to clean water from about 30% in 1978 to 40% in 1980/81.

1.02 The Water Utilities Corporation (WUC) was created in 1970 as an autonomous parastatal authority to operate the water supply facilities of the Shashe Infrastructure Project, and was required to take over water supplies to the Gaborone-Lobatse area within a short time from the Government-owned Gaborone Water and Electricity Unit. Since then it has taken over the water supply facilities of Francistown in 1979, previously run by the Municipality, and responsibility for water supplies to Jwaneng, from the Debswana mine management in 1985. Jwaneng is a rapidly developed diamond mining town. All other public water supplies are provided by District Councils and the DWA. WUC, which is required by its statute to operate on sound commercial lines, is already responsible for public water supplies to all major townships in Botswana, with the exception of Orapa, (also a mining town) where security problems are an issue.

1.03 One of the Government's goals is to encourage industry to locate in areas where ample water supplies are available. The project has been instrumental in furthering this objective by diverting some new industries from other areas where there is a shortage of water to Francistown which now has ample supplies from the Shashe Dam.

Banks Involvement in the Sector

1.04 The Bank's association with the water sector began with a Credit, 233-BT of US\$3 million in 1971 for expansion of supplies to Gaborone-Lobatse and establishment of the WUC. Two other loans for the Shashe Infrastructure Project (Loan 776-1 BT in 1971 and Loan 776-2 BT 1974) included finance for major water supply components to serve the Bamangwato Concessions Ltd. (BCL) mining project and the township of Selebi-Pikwe. An additional Credit 471-BT in 1974 and a Loan 1584-BT in 1978 for urban development in Francistown and Selebi-Pikwe also included water supply elements.

1.05 The Second Urban Project, Loan 1584-BT of 1978, contained a covenant that the Government would complete its intended transfer of responsibility for water operations in Francistown, from the Town Council to the WUC by April 1, 1979.

1.06 The Second Water Supply Project Loan 1763-BT of January 9, 1980 for US\$4.4 million, which is the subject of this report, was made to Government for onlending to WUC at the same interest rate as the Bank loan (7.9%), but with repayment over 25 years instead of 20 years, including a grace period of 5 years in each case. The project was in two parts. Part A of the project was designed to complement the earlier loans and credits for urban development by providing an ample long term water supply of high quality to augment and largely replace the existing poor quality and inadequate borehole supplies of Francistown. Part B of the project included consultants services for site investigation and design work in connection with a proposal to raise the height of the Gaborone Dam by 8 meters.

1.07 Part B of the project formed the basis of a third loan 2333-BT for US\$22 million (approved on July 7, 1983) for raising the Gaborone Dam, extension of mains and treatment works in and around Gaborone township as well as construction of service reservoirs and pumping stations. The loan also includes financing of studies and preliminary design work on two other dam sites, and studies for manpower development.

II. PROJECT PREPARATION AND APPRAISAL

Origin

2.01 In recognition of the rapidly increasing water demands in the eastern part of the country, the Government in the mid-1970s commissioned a number of studies with financial help from the UNDP and the African Development Fund. Their purpose was to investigate the feasibility of developing supplies from (a) the principal streams of northeastern Botswana; (b) the Okavanga Delta; (c) eleven sand rivers of eastern Botswana; and (d) boreholes; and in the light of these investigations to prepare a long term Master Plan for development of future supplies to Francistown.

2.02 Following these studies, which showed that the Shashe Dam reservoir was the least cost alternative having regard to the need to improve the quality of existing supplies from local wells, the Bank's Second Urban Project (Loan 1584-BT) included a requirement that the Government should prepare a plan of action, including a timetable, for provision of long term supplies to Francistown. In May 1978 the Government requested the Bank's assistance in financing a project based on their consultants recommendations and feasibility report.

Preparation, Appraisal, Negotiation and Approval

2.03 A Bank preappraisal mission in August 1978 confirmed the conclusions of the feasibility report but called for a refinement of the Francistown demand forecasts, the existing demands on the Shashe facilities and the required water treatment facilities. The result of these refinements proved satisfactory and the project was appraised in February 1979.

2.04 Negotiations took place in September 1979. Discussions focussed mainly on (i) the execution of a tripartite agreement between the Government, the Francistown Town Council and the WUC for transfer of the existing facilities to WUC on terms acceptable to the Bank; and (ii) the terms of the subsidiary loan agreement for onlending the proceeds of the Bank loan to WUC. Execution of these agreements was made a condition of effectiveness. Other covenants discussed and agreed were the keeping of separate accounts for Francistown and the adjustment of tariffs to enable the undertaking to earn specified rates of return on revalued assets in future years. Appointment of consultants acceptable to the Bank for design and supervision of construction, and consultation with the Bank over any appointment to the position of Chief Executive Officer of WUC were also agreed with the borrower because of a shortage of professional staff and the organization's dependence on a very small number of expatriates.

2.05 During the negotiations the Government explained that it had already approved a plan for sharing the exchange risk on external loans with parastatal bodies such as WUC, but the mechanics of how this should be put into effect had not been worked out. It was agreed that when the details had been worked out, they should be incorporated in a side letter to the supplemental agreement for onlending the proceeds of the loan, subject to the Bank's agreement on the basis of sharing. The loan was approved by the Bank's Executive Directors on October 23, 1979.

The Projects' Role in the Long-Term Plan

2.06 The project was the first stage of a Master Plan for meeting Francistown's water requirements. It was estimated to be capable of meeting the town's demand up to 1988/89. With relatively minor additions to the pumping and treatment works at Shashe, it was expected to be capable of meeting the demand up to 1995/96. At that time it would be necessary to provide additional pipeline capacity to cope with peak demands in excess of 12,000 cubic meters per day.

2.07 No adequate records of production and consumption in Francistown were available because prior to WUC's takeover, the water system was only partly metered by the Town Council. The consultants therefore metered

representative samples of consumers over a period in order to estimate past and future consumption for various land uses. A Population Growth Study commissioned by the Government in 1977 came up with a rather pessimistic estimate of 6% per annum compared with 10.4% projected for all urban areas. There was therefore little reliable data on which to base forecasts, a situation which was complicated by the fact that the Town Council's charges for water were well below the economic cost, which may have distorted the consultant's sampling of representative consumers. In any event, the forecasts of both growth and consumption proved to be conservative.

2.08 Existing supplies in Francistown were obtained from boreholes in the township area beside the Tati river. These supplies were polluted and contained excessive nitrate concentrations--possibly because sewer service was not introduced until the mid 1970s, and then only to commercial/industrial plots and a few high income residential plots. Apart therefore from augmenting supplies, one of the principal objectives of the project was to improve the quality of water delivered to consumers.

Project Description

2.09. The project consisted of two parts:

(a) Part A--comprised:

- (i) the construction of a treatment works, pumping station and additions to staff housing at the Shashe Dam;
- (ii) a 26 km pipeline to Francistown, and provision of a booster pumping station, a service reservoir and additional primary distribution mains in the town, and
- (iii) construction of a workshop, laboratory and stores and provision of operational requirements such as tools, stores, vehicles, etc.

(b) Part B--comprised:

- (i) consulting services to investigate the feasibility of raising the Gaborone Dam and the preparation of a preliminary design.

Although the project was designed to deliver 8000 cubic meters of water per day to Francistown initially, provision has been included for the installation of additional pumps and treatment facilities at a later date to increase the through-put to the full pipeline capacity of 12000 cubic meters per day.

Covenants

2.10 The principal covenants in the Loan Agreement were:

- (1) the government would relend the proceeds of the loan to WUC at the same rate of interest (7.9%) as the Bank loan but with repayment of principal over 25 years including five years grace, instead of 20 years including five years grace; and

- (11) the government would lend WUC the equivalent of US\$2.3 million at 6% interest, with repayment of principal over 25 years including 6 years grace to cover the local currency requirements of the project.

2.11 The principal covenants in the Project Agreement were:

- (1) WUC would employ consultants acceptable to the Bank for design and supervision of construction of Part A, and for carrying out Part B of the project;
- (ii) WUC would consult the Bank regarding the suitability of candidates for appointment to the position of Chief Executive Officer;
- (iii) WUC would not incur debt in local currency in any financial year in excess of Pula 55,000 without the Bank's agreement; and
- (iv) WUC would adjust Francistown tariffs so that the undertaking would earn a rate of return on revalued assets of at least 11% in 1981, 0% in 1982 through 1984 rising by 1% per annum until 1987 and 3% thereafter.

2.12 The reason for the relatively soft-lending terms to WUC, and the low rate of return, was that the undertaking taken over by WUC was in poor physical and financial shape, and it was expected to require some years of rehabilitation, good management and expansion, before tariffs could be raised to a level compatible with the costs of providing the service.

III. PROJECT IMPLEMENTATION, OPERATION AND COST

Effectiveness and Project Start-up

3.01 Conditions of effectiveness were that the subsidiary loan agreement and the tripartite agreement should have been executed (para. 2.04). There were no problems in completing the tripartite agreement which was signed in May 1980 after some bureaucratic delays in initiating its preparation. In the case of the subsidiary loan agreement, there was a delay of about 4 months in reaching agreement between the Bank and Government over the complicated wording of the side letter about sharing the exchange risk (para. 2.05). The side letter was signed on August 13, 1980 and the loan became effective on September 18, 1980. The delay of 4 months did not however affect the start of the project.

3.02 Design work and preparation of bidding documents by the consultants proceeded in parallel with the Bank's processing of the loan application, and the three principal contracts for civil works, pumping equipment and treatment works were awarded before the loan became effective. There was a delay of about 4 months in issuing bidding documents for the main pumping equipment due to a protracted discussion between the Bank and the consultants over the details of the design specification. This in turn delayed the issue of documents for the civil contract, details of which were dependent on the type of pumping equipment to be supplied. As a result, work on the main civil contract started two months late, in September 1980.

Revisions

3.03 There was only one major revision in the design of the project. The original project provided for a new 200 mm pipeline from the old boreholes in Francistown to the existing ground level storage reservoir, where mixing with the treated water from Shashe would take place. A cost analysis study carried out shortly after the award of the civil contract showed that it would be advantageous to reroute the borehole 200 mm pipeline to join the Shashe/Francistown pipeline about 2 km before the storage tank, and to increase the size of the last 2 km of the main pipe from 350 mm to 400 mm. The route as constructed is shown on the map at the end of this report.

3.04 In the original design for the main pumping station at Shashe, the consultants provided for horizontal shaft centrifugal pumps. During the protracted discussion on the bidding document specifications referred to in para. 3.02 above, the Bank recommended that bidders be permitted to quote for alternative types of pump. One bidder quoted as an alternative, vertical shaft turbine pumps, which on evaluation were shown to be marginally lower in cost over the life of the project than any of the other bids. The contract was therefore awarded on this basis. However, use of vertical shaft turbine pumps involved redesigning the pumphouse and filtered water storage arrangements, and changes in the arrangements for backwashing the filters. The use of vertical shaft turbine pumps also resulted in increased construction costs and contractual claims for delay.

Implementation Schedule

3.05 The original implementation schedule showed completion of the works by December 31, 1981. This was a tight schedule aimed at meeting the peak demand in the summer months, December to February, as there was a serious water shortage in Francistown. In the light of subsequent events it is possible the project could have been completed on time if it had been constructed to the consultants original specifications. The fact that it was not, was due partly to the delay in awarding contracts due to the changes to bidding documents required by the Bank, and the subsequent changes in design of civil works as a result of the use of vertical turbine pumps instead of the horizontal shaft centrifugal pumps originally specified by the consultants.

3.06 Supplies of water were first delivered to Francistown from the Shashe treatment works via a temporary cross connection direct into the Francistown distributing mains on May 13, 1982, approximately four and one half months late. The works were substantially complete and in full operation by August 31, 1982, but a considerable amount of finishing-off remained to be completed during the maintenance period, some of which is still outstanding but which is expected to be completed by end of February 1984. Great difficulty has been experienced in getting the main pumping equipment supplier from South Africa to finish off the minor outstanding details of his contract. One reason for this may be the demands being made on the services of pumping equipment suppliers in South Africa due to the severe drought conditions affecting the area in the last year or two.

3.07 No major problems were experienced with Part B of the project for investigation and design of the Gaborone Dam raising. Minor problems

caused by unexpected stone sizes in the dam, unexpected hardness of rock in some boreholes, and the need to take out more trial pits and an additional borehole caused a delay of one month in completing the field work. Nevertheless the final report was completed one month ahead of the scheduled date of December 31, 1981.

Procurement

3.08 Part A of the project was divided into three main supply and erect contracts. A civil contract including supply of the main pipeline and storage tank, and two equipment contracts for the main pumping station and the treatment works. The procedure followed was in accordance with the Bank's Guidelines. Of 22 firms from 6 different countries who on applied for prequalification questionnaires for the civil contract, 12 applied for prequalification, 7 of whom were prequalified. With one exception, all the nine bids for the two equipment contracts were from South African firms. In fact of the 31 firms who requested tender documents, 24 were South African. It is doubtful in these circumstances whether international bidding procedures conferred any real benefit on the borrower.

3.09 In the case of a small contract for about US\$20,000 for communications equipment, the Bank agreed to this being negotiated with a firm which had already supplied communication equipment to WUC. The reason being partly because of the need to have matching equipment but also because of the total lack of facilities in Botswana for maintenance of other suppliers equipment.

Costs and Disbursements

3.10 Total costs of the project were US\$6.667 million equivalent compared with an appraisal estimate of US\$6.265 million--an increase of 6.4%. During the period of construction 1980-84 the exchange rate changed from a high of US\$1.3 to the Pula in 1981 to a low of US\$0.91 to the Pula in 1983. In terms of Pula, the cost of Part A of the project (Francistown Water Supply) was 15.2% above the appraisal estimate. The increase was accommodated in the local currency loan to WUC from the government (para. 2.10 (ii)) and a Pula equivalent appreciation in the value of the dollar loan which partially off-set the Pula cost increases. A breakdown of costs is given in Annex 1. The large difference between the actual (15%) and estimated (68%) proportions of foreign to local costs is because both the civil contractor and the consultants were registered in Botswana and were paid in local currency.

3.11 Most of the increase in cost was due to an increase of about 100% in labor costs in Botswana during the construction period, and a high rate of inflation in South Africa. Provision for price contingencies covered only about 70% of the actual increase and resulted in a substantial underestimation.

3.12 There was a considerable saving in the main pipeline costs due to the use of reducing grades of asbestos cement pipes for the last 13 kms instead of steel, with pressure relief valves at the junctions.

3.13 Cost of Part B of the project was about 14% above the estimated cost due mainly to additional site investigation works (para. 3.07) and the escalation of labor costs.

3.14 A schedule comparing actual with estimated disbursements is given in Annex 2. Disbursement was slow due mainly to delay in forwarding applications by the Government, and in one case in FY83, by loss of documents in the post. The revised closing date for the loan was June 30, 1984 but final payments to contractors continued up to early 1985.

Operations

3.15 The project had been in service for a period of 20 months at the time of the PCR mission, initially as the principal source of treated water for Francistown, and more recently as the sole source whilst rehabilitation of the old borehole facilities is being undertaken. There have been very few interruptions to the supply and the project as a whole has proved very reliable. However, there have been many minor problems due to pumping equipment and instrumentation failing to fully meet specifications, and a reluctance on the part of the supplier to rectify these matters promptly, and finish off the works. These have been subsequently corrected.

3.16 Two low lift Archimedes screw pumps at the intake from Shashe Dam had cracked shafts after a short period of operation and had to be returned to the manufacturer for repair. Although now working again, their efficiency is below specification. However, these pumps will only be required to operate in the rare event of the water in the Shashe Reservoir falling to a very low level. Their efficiency is therefore not a matter of critical importance. Excessive noise from the three main pump motors necessitated their return to the manufacturers for modification. Since there is, at this stage of development, spare pumping capacity their return to the manufacture for modification, one by one, did not involve any interruption of supplies to Francistown. The pumps supplying the Dumela Industrial area as designed based on the Bank's requirements, proved to be unsuitable for the purpose and have now been replaced by the manufacturer with pumps of a different type. An alternative arrangement relying on partial gravity feed had been devised by WUC and this meets the current demand.

3.17 Most, if not all the problems with pumps and instruments might have been avoided by closer supervision by the borrower's agents during the manufacturing stage. In this case the consultants employed an agent in South Africa to carry out the inspections and witness tests at the manufacturers works, and this was evidently not done satisfactorily. As a result of this experience the Consultants are now carrying out inspections on later contracts with their own staff.

Performance of Consultants, Contractors, Suppliers and Borrower

3.18 Performance of the consultants was good with the exception of their inspection and witnessing of tests of goods in manufacture, where they seem to have been badly let down by their agent. Their initial design for the project was a simple, straightforward installation using equipment of a type with which WUC was already familiar. The Bank's insistence on opening up of the equipment specifications to alternative designs put forward by the suppliers, reference is made to the main pumping station at Shashe, para. 3.04, and Dumela pumps, para. 3.16, resulted in a considerable amount of redesign work for the civil contract and was a material factor in delaying completion of the project.

3.19 Difficulties were encountered with respect to the performance of the three main contractors. All of them were dependent on their South African principals for their resources of men and material. From the outset all three had difficulty in obtaining their requirements because of competing demands from their principal's other activities in South Africa, where something approaching boom conditions existed in the construction industry. Frequent changes in supervisory staff had to be made due to inexperience or incompetence. Coordination was lacking between the main contractors and their sub-contractors, and in the case of equipment suppliers deliveries were often late and piecemeal with no proper coordination, resulting in much time being wasted on locating missing items. The impression was given by all three contractors that due to other commitments in South Africa, the project was of low priority in their work programs. Deduction of liquidated damages from progress payments seems to have had little effect. Remedial works to correct deficiencies sometimes had to be redone because they, too, were unsatisfactory. However, in spite of the difficulties and delays the project as constructed is of a satisfactory standard apart from some relatively minor cosmetic deficiencies.

3.20 Relations between the Borrower, the Beneficiary, the Consultants and the Bank were at all times excellent. The Beneficiary (the WUC) is a small, highly efficient, compact organization with a dedicated staff determined to maintain the highest possible standards.

IV. OPERATING PERFORMANCE

Market

4.01 The lack of historical data coupled with the effect of former frequent restrictions in supply and other factors make demand forecasting for the Francistown area a very subjective exercise. The known projected developments, even coupled with the accelerating development of the town and the Government's policy of diverting industries from other areas with severe water problems to Francistown, do indicate however, a slower growth of demand for water than that envisaged at the time of project appraisal. The following table shows the actual and current forecast sales in megalitres per annum by the WUC, compared with the appraisal estimates.

Sales in Thousand Megalitres per Annum

<u>Year ending March 31</u>	<u>Appraisal Estimate</u>	<u>WUC Actual and Current Forecast 1/</u>
1983	1207	1148 (actual)
1984	1296	1400
1985	1389	1440
1986	1486	1600
1987	1565	2000
1988	1649	2400
1989	1738	2700

1/ Recent Government comments indicate that WUC forecast, under preparation, appear to be closer to the appraisal estimate.

4.02 On the basis of the above estimates additional pumping capacity and additions to the treatment works at Shashe will be required to increase the system capacity from 8,000 m³/day to 12,000 m³/day in 1987/88 instead of in 1989/90, estimated at the time of appraisal. The system would be operating at full capacity of 12,000 m³/day in 1990 instead of in 1995/96. This more rapid loading of the facilities is estimated to be reflected in improved financial results, as shown in Annex 3. Tariffs were increased from an average of 38 thebe/kilolitre in 1981/82 to an average of 60 thebe in 1982/83 and 74 thebe in 1983/84. These large increases do not seem to have had any noticeable effect in suppressing demand, and in fact further annual increases up to 110 thebes/kilolitre in 1988 are planned.

4.03 It is difficult to be precise as to the incremental sales attributable to the project. In the year before Shashe water became available, sales in Francistown were 1005 megalitres, but this was an unreliable and heavily polluted supply, which has now been relegated to the status of an emergency source and is in effect obsolete. An analysis of pumping costs has shown that water from the Shashe source cost less in Francistown than water from the boreholes in the town, the main reason being that standard power costs at the boreholes are 5.5 times those at Shashe which benefits from the BCL special tariff. This benefit was not apparently foreseen in the appraisal report. Boreholes will, however, form an essential part of the Francistown supply as demand grows.

4.04 The secondary benefits of the project are very considerable but are in the main unquantifiable. For example, a heavily polluted restricted and unreliable water supply has been replaced by a reliable unrestricted supply of clean palatable water with capacity, for expansion to seven times the present demand. Improvements in the towns secondary distribution and the mode of operation have reduced system losses to about 11% (previously estimated at over 30%). One of the spin-offs of the project has been the opportunity it has provided the Government to direct new industries to the town, which might otherwise have been lost to Botswana because of the acute water shortages in Gaborone and elsewhere. In the three years 1981 through 1983, twenty new industries ranging from cosmetics and garments, to plastics and autospare, employing about 850 people, commenced operations in Francistown. Another seven industries employing nearly 700 people had license applications under consideration in September 1983. An additional spin-off was the training of a number of WUC technicians in construction procedures. These trainees who had already attended full-time technical training courses in Swaziland under the sponsorship of WUC, were attached to the consultants for a period of one year each, during construction of the project.

V. FINANCIAL PERFORMANCE

5.01 WUC's appraisal forecast and actual income statements, balance sheets and sources and application of funds statements for the Francistown undertaking are shown in Annex 3, pages 1 to 3. The results are broadly in line with the appraisal report projections up to the year ending March 31, 1983, in spite of a lower volume of sales due to delay in completing the project. From 1983 onwards results are expected to be better than forecast because of higher tariffs and a substantially higher than forecast growth of demand (para. 4.01).

Income Statements

5.02 WUC's financial objectives as defined in the financial covenants of the Project Agreement were:

- (a) to maintain tariffs at a level sufficient to earn an annual rate of return on revalued assets of not less than 11% in 1981, 0% in the years 1982 through 1984, 1% in 1985, 2% in 1986 and 3% thereafter; and
- (b) to limit additional debts in local currency to Pula 55,000 per annum.

5.03 The above objectives have been met by WUC in all years to date. A tariff increase of 50% was introduced in FY83 and a further increase of 23% in FY84. The latter increase is expected to enable the undertaking to earn a rate of return of 1.2% in FY84 compared with 0% required by the covenant. It is WUC's present policy to progressively increase tariffs in excess of those specifically required by the loan covenant in order to generate cash for local development expenditures. Current forecasts expect the average tariff to rise from the current 74 thebes/kilolitre to 110 1/ thebes/kilolitre in 1988 by which time the rate of return is expected to be 7.4%. An increase to 85 thebes/kilolitre, effective April 1984, has already been approved by Government. Tariff increases of approximately 95% since 1980 have kept well ahead of inflation which over the past four years (1981 thru 1984) has totalled about 68% as measured by the urban cost of living index.

5.04 WUC's tariff charges are different for each of the four separate accounting areas of Gaborone, Lobatse, Shashe and Francistown. Overall they reflect the costs of supply and are governed by Bank loan covenants which require WUC to earn a rate of return of 8% on revalued assets at Gaborone and Lobatse, and 8% on historically valued assets at Shashe. Details of the current tariffs are given in Annex 4 from which it will be seen that the first 10 kilolitres per month and the supply to standpipes is at a low rate well below the cost of supply. In 1983 for Francistown it was about 40% of the cost of supply excluding interest on capital. This social tariff for small consumers and low-income category housing areas, is subsidized entirely by higher charges to larger consumers.

5.05 Operating costs have been higher than expected due largely to higher than estimated costs of power for pumping. These costs were more than compensated for by increased revenue due to higher tariffs (para. 5.03) with the net result that the operating ratio was better than expected.

5.06 Section 19 of the Water Utilities Corporation Act requires the WUC to earn a reasonable return on the capital employed, and in defining the term "reasonable return" mentions that net income should be sufficient among other things to make dividend payments to Government in respect of its equity interest in WUC. The Government has an equity interest of about Pula 90,000 in respect of the Gaborone/Lobatse undertaking on which WUC is currently paying an annual dividend of 7%.

1/ The current average tariff inforce for 1986/87 is 132 thebe/kilolitre.

Balance Sheets

5.07 Because of the delay in completion of the project (para. 3.06) net plant in operation was substantially below the estimates until 1983, after which it is expected to increase much faster than estimated in the appraisal report due to the accelerated growth of demand (para. 4.01) and the consequential need to develop the distribution system and upgrade the old groundwater sources. Since these developments will be financed by revenue surpluses and capital contributions from consumers, the debt/equity ratio will improve earlier than forecast.

5.08 Considering the poor shape of the Francistown undertaking when taken over by WUC, with many consumers having unmetered suppliers, the appraisal estimate of receivables at 10% of annual revenue in the first years of operation was unrealistic. However, they have already been reduced from 55% in 1980 to 38% in 1983 and are expected to be reduced to about 14% from now on. Receivables for WUC's other areas of supply (Gaborone, Lobatse and Shashe) were 9.7% in 1983.

5.09 Revaluation of assets has been based on the urban cost of living index for Botswana, issued by the Government. A 10% average for future years has been assumed compared with 9% in the appraisal report. Actual inflation from 1981 to 1983 as measured by the government index has been 43% compared with 19% assumed in the appraisal report.

Source and Application of Funds

5.10 Internal sources of finance were slightly less than anticipated in 1981 and 1982 in spite of higher tariffs, due mainly to the higher than expected operating costs (para. 5.05). However, from 1984 onwards internal sources are expected to exceed the estimates and should provide all the funds required for renovation and rapid expansion of the Francistown undertaking until about 1989, when it will be necessary to develop an additional major source of raw water (para. 4.02).

5.11 Construction expenditures for the project have been financed entirely by the loans from the Bank and the Government as intended. Due to the more rapid growth of demand and consequential expansion of the distribution system, which is expected to be financed entirely from internal sources (para. 5.10), the debt service coverage at 1.2 in 1983 rising to 2.2 in 1985, will be somewhat better than anticipated. The WUC is largely protected by the Government against currency fluctuations, as provided for in the side letter to the subsidiary agreement (para. 2.05).

5.12 The WUC has met all its financial targets to date and is expected to do so in future. Its accounts are well kept and in the four years following the Francistown taken over, have been certified correct without qualification, within four months of the end of each financial year.

Economic Rate of Return (ERR)

5.13 The economic rate of return of the project is the discount rate at which the present value of capital and operating costs, excluding duties and taxes, is equal to the present value of benefits attributable to the investments over the economic life of the project. Capital and operating costs and benefits associated with the increase of system capacity to

12,000 m3 per day have been included in the cost and benefit streams. Incremental water revenues have been used as the best proxy for benefits attributable to the investments. Further revenues have been based on tariff increases already approved and planned. On this basis the economic rate of return on Part A of the project in terms of 1980 prices is 11.7% compared with 11% forecast in the appraisal report. Details are set out in Annex 5. The improvement is due to a higher rate of growth in demand and to larger increases in tariffs than those foreseen at the time of appraisal. The principal factors affecting the accelerated growth in demand were:

- (a) an influx of immigrants from Zimbabwe; and
- (b) the acute water shortage in Gaborone and other parts of the country which led to diversion of new industries to Francistown (para. 4.04).

The economic rate of return would be higher than 13.1% if the unquantifiable health, environmental and social benefits could have been included along with the net benefits from new industries which would have been lost to Botswana (at least for some years) had the project not been constructed.

Covenants

5.14 The Borrower and the Beneficiary have met all the covenants in the Loan and Project Agreements in full and without difficulty.

VI. INSTITUTIONAL PERFORMANCE

Management and Organization

6.01 A high degree of efficiency in WUC management has been maintained through two changes in the Chief Executive (both expatriate) since appraisal of the project. Some changes in the organization were introduced with the addition of the Francistown undertaking. The present organization is shown in Annex 6 and includes positions for Jwaneng undertaking which is scheduled to be taken over by WUC in 1984. The present establishment has 394 posts of which 20 are filled by expatriates in the absence of any suitably qualified local individuals. This compares with 344 posts including 19 expatriates at the time of appraisal in 1979. All expatriates are on two-year contracts, which may be extended by one year or renewed for two years as the need arises. There is, however, a high turnover and none of the present expatriates were on the staff in 1979. There is only one professional Botswana on the staff; he occupies the post of Principal Administrative Officer. There are no Botswana in any of the technical or accounting professional posts.

6.02 The lack of professional Botswana staff has not created any problems so far. Suitably qualified expatriates have been available on two-year contracts, but the total absence of a pipeline of potential candidates for the senior technical and accounting positions and the high turnover of expatriates is disquieting. Part of the problem lies in the schools' curricula which do not provide a sound basis for engineering

training. Students sent under the Staff Training Scheme to a waterworks operators course at the Swaziland College of Technology are said to have been unable to benefit fully from it because of their lack of basic training in the sciences. Training of accountants to sub-accountant level at the Botswana Institute of Administration and Commerce has been more successful, but there have been losses due to more attractive salary scales in local industry.

6.03 It is the corporation's policy to localize all positions in the establishment as soon as possible and to further this aim it appointed a consultant to carry out a review of the corporation's future manpower requirements, prepare job descriptions and training programs and review salary scales in the context of other employers in Botswana. A sum of US\$300,000 was included in the Third Water Supply Project, Loan 2333-BT (para. 1.07) to cover the cost of this study and the first stage of a senior staff development program. Unless, however, the Government takes steps to improve the basic training in sciences at primary and secondary levels, it will be difficult for WUC to make much headway in training local candidates for professional engineering positions.

VII. PROJECT JUSTIFICATION

Project Achievements

7.01 The project achieved all its objectives and more. It met the existing demand and provided for future growth up to seven times the present demand. It replaced an inefficient unreliable supply of poor quality water with a reliable supply of clean water and an efficient organization to deal with expansion and consumers' requirements. It also provided an unforeseen benefit by averting the loss of new industries to Botswana on account of the severe water shortages in other areas.

Least-cost Alternative

7.02 The consultants who prepared the engineering studies in 1977 showing that the Shashe source was the least-cost solution for supplies to Francistown, have reviewed their original calculations in the light of the actual construction costs. These show that the actual cost of the pipeline and pumping stations in 1977 prices is less than the estimated cost used in the comparison with alternative schemes, confirming the original conclusion that the project is the least-cost solution.

VIII. BANK PERFORMANCE

General

8.01 In general the Bank's performance was good. However, on the procurement issue the Bank became involved in considerable discussion with the consultants on details of design which delayed the project by some months and caused some increase of costs. The net result of the Bank's intervention into the design aspects was a final installation substantially different from the consultants' original design and the one preferred by

the borrower, but with marginalcost advantages only. The consultant's original design was a simple one using pumping equipment of a type already in use on WUC installations, whereas the final installation utilizes equipment requiring a higher degree of skill in maintenance. So long as highly skilled expatriates are available for maintenance this may not be a matter of concern, but this situation is likely to change well before the end of the equipment's useful life. With hindsight it might have been better to accept the consultant's original proposals which seem to have been well suited to the skills likely to be available to WUC over the life of the project. There is little doubt that Bank involvement in the design ultimately resulted in some cost increases as well as operational problems with the Dumela pumping.

Supervision

8.02 Active supervision of the project works (Part A of the Project) by Bank staff ceased with a mission in September 1981 when the project was about 60% complete. Staff constraints were the reason for lack of supervision missions thereafter. However, supervision of the WUC's general performance continued through preparation and appraisal of the third water project. It is doubtful whether further Bank missions could have contributed anything more to the successful completion of the project than that already provided by the consultants--except perhaps in expediting applications for disbursements.

Working Relationships

8.03 Cooperation and frank exchange of information between the WUC, the various ministries in Government and the Bank were excellent at all times. Relations between Bank staff and the WUC's consultants were also good in spite of some initial strain due to professional differences of opinion regarding project design.

IX. CONCLUSIONS

9.01 The project achieved all its objectives by replacing a restricted rundown, unreliable, and contaminated water supply in Francistown with an unrestricted and reliable supply of clean treated water for many years to come, and at the same time preparing the way for the third water project. Financially the results have been better than expected and are likely to continue so. Moreover, the Government is now in a position to divert new industries to the Francistown area thus relieving the pressure on the water resources of the Gaborone area.

9.02 If there is a lesson to be learned from this project, it is that where an efficient and experienced agency initiates and designs a project with the aid of reputable consultants having the benefit of local knowledge and experience, the Bank should hesitate to initiate changes unless there are manifestly good reasons for doing so. In this case the estimated marginal financial benefits resulting from the changes initiated by the Bank have to be weighed against the unquantifiable costs of delay in completing the project. Moreover, if the agency and their consultants' judgement was sound in choosing the original design, even the estimated marginal financial benefits may prove to be ephemeral.

9.03 The benefits deriving from the project are to a great extent dependent on continuing good management and skilled maintenance, at present provided by expatriates on two-year contracts. Some difficulty has already been experienced in recruiting and retaining expatriates due to uncompetitive remuneration and high rates of inflation in Botswana. It will take a minimum of four years for sponsored students to reach graduate level at universities and further training will then be necessary in WUC before they will be able to adequately fill the professional posts now occupied by expatriates. A sense of urgency in this matter seems to be lacking. Future Bank lending in the water, urban and education sectors should be directed towards helping the Government and WUC to correct this situation.

BOTSWANA

SECOND WATER SUPPLY PROJECT - LOAN 1763

COMPARISON OF ACTUAL AND ESTIMATED PROJECT COSTS

Part A of Project - Francistown Water Supply

<u>Year ending 31st March</u>	<u>Actual Expenditures (in 100 Pula)</u>	<u>Average Exchange Rate to US\$</u>	<u>Actual Expenditures in US\$ equiv.</u>	<u>Appraisal Estimate Expenditures in US\$ at (in 100 Pula) Exchange Rate 1.2</u>	
1980	281	1.024	288	2,264	
1981	10,680	1.299	13,873	24,099	
1982	29,892	1.125	33,629	19,668	
1983	9,595	0.919	8,818	2,404	
1984	5,051	0.910	4,596		
1985	332	0.9	299		
TOTAL	55,831		61,503	48,435	58,122

Increase in terms of Pula = 15.2%
Increase in terms of US\$ = 5.6%

Part B of Project - Gaborone Dam Investigations

1980	99	1.024	101	--	--
1981	1,667	1.299	2,165	--	--
1982	2,362	1.125	2,657	3,773	4,528
1983	266	0.919	244	--	--
TOTAL	4,394		5,167	3,773	4,528

Increase in terms of Pula = 16.4%
Increase in terms of US\$ = 14.1%

Total Project costs **60,225** **66,670** **52,208** **62,650**

Increase in terms of Pula = 15.4%
Increase in terms of US\$ = 6.4%

BOTSWANA

SECOND WATER SUPPLY PROJECT - LOAN 1763

ACTUAL PROJECT COSTS (Pula x00)

<u>Year Ending March 31st</u>	<u>LOCAL COSTS</u>						<u>FOREIGN COSTS</u>						<u>TOTAL</u>
	<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>	
<u>Civil Works</u>													
Preliminary and General Items	--	2,428	4,756	Cr.892	1,202	--	--	--	--	--	--	--	7,494
Raw Water Main	--	--	89	238	26	--	--	--	--	--	--	--	353
Shashe Works and Pump House	--	182	4,624	1,660	650	--	--	--	--	--	--	--	7,116
Main Pipeline	--	2,771	11,621	2,875	1,318	--	--	--	--	--	--	--	18,585
Francistown Booster Station	--	--	886	487	133	--	--	--	--	--	--	--	1,506
Francistown Reservoir	--	221	2,017	354	201	--	--	--	--	--	--	--	2,793
Pipelines in Francistown	--	--	223	457	94	--	--	--	--	--	--	--	774
Staff Housing	--	2,253	612	78	--	--	--	--	--	--	--	--	2,943
Sub Total	--	7,855	24,828	5,257	3,624	--	--	--	--	--	--	--	41,564
<u>Equipment</u>													
Shashe Pump House	--	--	--	--	--	--	--	981	1,615	546	148	--	3,290
Shashe Treatment Plant	--	--	--	--	--	--	--	1,951	855	85	100	--	2,991
Francistown Pump House	--	--	--	--	--	--	--	373	760	200	64	--	1,397
Tools and Spares	--	--	--	--	--	--	--	--	--	266	20	--	286
Communications	--	--	222	--	--	--	--	--	--	--	--	--	222
Sub Total	--	--	222	--	--	--	--	3,305	3,230	1,097	332	--	8,186
<u>Consulting Services</u>													
Engineering Design	115	2,081	--	--	83	--	166	--	--	--	--	--	2,445
Construction Supervision	--	744	1,537	1,108	197	--	--	--	--	50	--	--	3,636
Sub-Total	115	2,825	1,537	1,108	280	--	166	--	--	50	--	--	6,081
Total Francistown Project	115	10,680	26,587	6,365	3,904	--	166	--	3,305	3,230	1,147	332	55,831
Appraisal Estimate of Francistown Costs	208	5,503	8,905	740	--	--	2,056	18,596	10,743	1,664	--	--	48,435
<u>Gaborone Dam Raising Investigation</u>													
Site Investigation	--	50	--	--	--	--	--	--	1,017	--	--	--	1,067
Engineering Design	25	1,617	1,345	266	--	--	74	--	--	--	--	--	3,327
Total Gaborone Investigation	25	1,667	1,345	266	--	--	74	--	1,017	--	--	--	4,394
Total Actual cost of Project	140	12,457	27,932	6,631	3,904	--	240	--	4,322	3,230	1,147	332	60,225
Appraisal Estimate of Total Project Costs	208	5,503	9,279	740	--	--	2,056	18,596	14,162	1,664	--	--	52,208

BOTSWANA

SECOND WATER SUPPLY PROJECT - LOAN 1763-BT

DISBURSEMENTS
(US\$ million)

<u>IBRD FY</u> <u>and</u> <u>Quarter</u>	<u>Amount Disbursed</u> <u>in Quarter</u>		<u>Cumulative Disbursements</u>			
	<u>Estimate</u>	<u>Actual</u>	<u>Amount</u>		<u>% of Total</u>	
	<u>Estimate</u>	<u>Actual</u>	<u>Estimate</u>	<u>Actual</u>	<u>Estimate</u>	<u>Actual</u>
<u>1980</u>						
Third Quarter	0	0	0	0	0	0
Fourth Quarter	0	0	0	0	0	0
<u>1981</u>						
First Quarter	200	0	200	0	5	0
Second Quarter	800	27	1,000	27	23	1
Third Quarter	600	20	1,600	47	37	1
Fourth Quarter	600	173	2,200	200	51	5
<u>1982</u>						
First Quarter	700	688	2,900	908	66	21
Second Quarter	500	1,361	3,400	2,269	78	52
Third Quarter	300	474	3,700	2,743	85	62
Fourth Quarter	250	0	3,950	2,743	90	62
<u>1983</u>						
First Quarter	150	504	4,100	3,247	93	74
Second Quarter	100	0	4,200	3,247	95	74
Third Quarter	200	0	4,400	3,247	100	74
Fourth Quarter	—	764	—	4,011	—	91
<u>1984</u>						
First Quarter	—	27	—	4,038	—	92
Second Quarter	—	0	—	4,038	—	92
Third Quarter	—	162*	—	4,200*	—	95
Fourth Quarter	—	200*	—	4,400*	—	100

* Estimated

MEMORANDUM
SECOND WATER SUPPLY PROJECT - LOW 1763-BE
WATER UTILITIES CORPORATION
FINANCIAL STATEMENTS - FISCAL YEAR 1987
(In thousands of dollars)

Year Ending March 31st	1986		1985		1984		1983		1982		1981		1980	
	Estimated	Actual	Estimated	Actual	Estimated	Actual	Estimated	Actual	Estimated	Actual	Estimated	Actual	Estimated	Actual
Plant in Operation	655	718	1,405	1,057	718	1,075	7,430	7,386	332	580	108	211	67	1,405
Plant in Operation	7	11	48	67	108	108	580	580	332	580	108	211	67	1,405
Plant in Operation	648	515	1,357	671	6,369	1,749	6,920	7,054	6	6	4,272	2,731	1,357	648
Plant in Progress	231	117	2,731	1,737	—	—	—	—	—	—	—	—	—	231
Current Assets	114	127	218	557	380	205	284	563	278	712	400	961	546	114
Accounts Receivable	15	93	36	113	50	225	61	207	77	155	94	184	114	15
Inventory	15	9	45	9	60	22	20	27	80	30	35	180	40	15
Total Current Assets	144	229	297	679	490	452	415	871	435	897	506	1,461	781	144
Total Assets	1,023	871	4,385	3,087	6,839	6,473	7,335	7,537	7,689	9,073	8,170	10,197	8,477	1,023
Liabilities	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Retained Earnings	67	21	169	114	203	150	-15	-7	-24	-60	-27	-27	-61	67
Current Contract Allowance	53	53	650	772	960	960	723	360	1,346	1,008	960	1,431	961	53
Revenue in Advance	—	—	30	80	152	152	155	273	1,115	2,000	1,934	2,682	2,627	—
Total Equity	117	74	849	946	1,315	1,293	1,568	1,251	1,932	1,983	2,402	3,121	2,981	117
Long Term Debt	905	713	3,526	1,724	5,514	4,414	5,752	5,751	6,427	5,748	4,411	5,636	6,327	905
Current Liabilities	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Accounts Payable	73	10	384	10	752	15	820	15	646	20	651	21	657	73
Contractor Payables	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total Current Liabilities	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total Liabilities	1,023	871	4,385	3,087	6,839	6,473	7,335	7,537	7,689	9,073	8,170	10,197	8,477	1,023
Equity	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Retained Earnings	67	21	169	114	203	150	-15	-7	-24	-60	-27	-27	-61	67
Current Contract Allowance	53	53	650	772	960	960	723	360	1,346	1,008	960	1,431	961	53
Revenue in Advance	—	—	30	80	152	152	155	273	1,115	2,000	1,934	2,682	2,627	—
Total Equity	117	74	849	946	1,315	1,293	1,568	1,251	1,932	1,983	2,402	3,121	2,981	117
Long Term Debt	905	713	3,526	1,724	5,514	4,414	5,752	5,751	6,427	5,748	4,411	5,636	6,327	905
Current Liabilities	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Accounts Payable	73	10	384	10	752	15	820	15	646	20	651	21	657	73
Contractor Payables	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total Current Liabilities	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total Liabilities	1,023	871	4,385	3,087	6,839	6,473	7,335	7,537	7,689	9,073	8,170	10,197	8,477	1,023
Equity	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Retained Earnings	67	21	169	114	203	150	-15	-7	-24	-60	-27	-27	-61	67
Current Contract Allowance	53	53	650	772	960	960	723	360	1,346	1,008	960	1,431	961	53
Revenue in Advance	—	—	30	80	152	152	155	273	1,115	2,000	1,934	2,682	2,627	—
Total Equity	117	74	849	946	1,315	1,293	1,568	1,251	1,932	1,983	2,402	3,121	2,981	117
Long Term Debt	905	713	3,526	1,724	5,514	4,414	5,752	5,751	6,427	5,748	4,411	5,636	6,327	905
Current Liabilities	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Accounts Payable	73	10	384	10	752	15	820	15	646	20	651	21	657	73
Contractor Payables	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total Current Liabilities	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total Liabilities	1,023	871	4,385	3,087	6,839	6,473	7,335	7,537	7,689	9,073	8,170	10,197	8,477	1,023
Equity	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Retained Earnings	67	21	169	114	203	150	-15	-7	-24	-60	-27	-27	-61	67
Current Contract Allowance	53	53	650	772	960	960	723	360	1,346	1,008	960	1,431	961	53
Revenue in Advance	—	—	30	80	152	152	155	273	1,115	2,000	1,934	2,682	2,627	—
Total Equity	117	74	849	946	1,315	1,293	1,568	1,251	1,932	1,983	2,402	3,121	2,981	117
Long Term Debt	905	713	3,526	1,724	5,514	4,414	5,752	5,751	6,427	5,748	4,411	5,636	6,327	905
Current Liabilities	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Accounts Payable	73	10	384	10	752	15	820	15	646	20	651	21	657	73
Contractor Payables	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total Current Liabilities	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total Liabilities	1,023	871	4,385	3,087	6,839	6,473	7,335	7,537	7,689	9,073	8,170	10,197	8,477	1,023
Equity	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Retained Earnings	67	21	169	114	203	150	-15	-7	-24	-60	-27	-27	-61	67
Current Contract Allowance	53	53	650	772	960	960	723	360	1,346	1,008	960	1,431	961	53
Revenue in Advance	—	—	30	80	152	152	155	273	1,115	2,000	1,934	2,682	2,627	—
Total Equity	117	74	849	946	1,315	1,293	1,568	1,251	1,932	1,983	2,402	3,121	2,981	117
Long Term Debt	905	713	3,526	1,724	5,514	4,414	5,752	5,751	6,427	5,748	4,411	5,636	6,327	905
Current Liabilities	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Accounts Payable	73	10	384	10	752	15	820	15	646	20	651	21	657	73
Contractor Payables	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total Current Liabilities	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total Liabilities	1,023	871	4,385	3,087	6,839	6,473	7,335	7,537	7,689	9,073	8,170	10,197	8,477	1,023
Equity	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Retained Earnings	67	21	169	114	203	150	-15	-7	-24	-60	-27	-27	-61	67
Current Contract Allowance	53	53	650	772	960	960	723	360	1,346	1,008	960	1,431	961	53
Revenue in Advance	—	—	30	80	152	152	155	273	1,115	2,000	1,934	2,682	2,627	—
Total Equity	117	74	849	946	1,315	1,293	1,568	1,251	1,932	1,983	2,402	3,121	2,981	117
Long Term Debt	905	713	3,526	1,724	5,514	4,414	5,752	5,751	6,427	5,748	4,411	5,636	6,327	905
Current Liabilities	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Accounts Payable	73	10	384	10	752	15	820	15	646	20	651	21	657	73
Contractor Payables	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total Current Liabilities	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total Liabilities	1,023	871	4,385	3,087	6,839	6,473	7,335	7,537	7,689	9,073	8,170	10,197	8,477	1,023
Equity	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Retained Earnings	67	21	169	114	203	150	-15	-7	-24	-60	-27	-27	-61	67
Current Contract Allowance	53	53	650	772	960	960	723	360	1,346	1,008	960	1,431	961	53
Revenue in Advance	—	—	30	80	152	152	155	273	1,115	2,000	1,934	2,682	2,627	—
Total Equity	117	74	849	946	1,315	1,293	1,568	1,251	1,932	1,983	2,402	3,121	2,981	117
Long Term Debt	905	713	3,526	1,724	5,514	4,414	5,752	5,751	6,427	5,748	4,411	5,636	6,327	905
Current Liabilities	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Accounts Payable	73	10	384	10	752	15	820	15	646	20	651	21	657	73
Contractor Payables	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total Current Liabilities	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total Liabilities	1,023	871	4,385	3,087	6,839	6,473	7,335	7,537	7,689	9,073	8,170	10,197	8,477	1,023
Equity	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Retained Earnings	67	21	169	114	203	150	-15	-7	-24	-60				

REVENUES

SEWER WATER SUPPLY PROJECT - LOAN 1763-BT

WATER UTILITIES CORPORATION

SOURCES AND APPLICATIONS OF FUND REVENUES
(in thousands of Rupees)

Year Ending March 31st	1981		1982		1983		1984		1985		1986		1987	
	Estimated	Actual	Estimated	Actual	Estimated	Actual	Estimated	Actual	Estimated	Actual	Estimated	Actual	Estimated	Actual
<u>Internal Sources</u>														
Net Income before Interest Depreciation	177	186	39	41	-46	35	-	154	74	249	155	303	242	790
	41	31	159	51	281	194	311	285	340	309	371	333	405	300
Total	136	117	198	180	214	229	311	449	414	558	526	736	647	1,140
<u>Operational Requirements</u>														
Working Capital	89	-293	11	-211	16	38	26	43	22	24	40	40	25	75
Debt Service (principal and interest)	15	-10	5	-10	234	187	261	232	260	275	330	491	551	764
Total	54	-313	16	-211	230	225	287	275	282	299	340	531	576	839
Net Funds Available from Operations	884	420	162	321	-56	4	24	174	132	259	156	205	71	301
<u>Construction Requirements</u>														
Project	2,520	979	1,988	2,967	240	981	-	703	-	-	-	-	-	-
Other	720	751	310	635	41	55	30	35	10	455	10	1,324	10	515
Total	3,240	1,730	2,298	3,602	281	1,036	30	738	10	455	5,838	7,564	10	515
Balance to Finance:	3,116	1,180	2,116	3,281	366	1,072	6	564	-122	196	5,472	6,303	-41	214
Financed by:														
Other Loans	120	72	-	51	-	34	-	-	-	-	-	-	-	-
Project Loans (bank)	1,859	793	916	2,165	166	1,054	-	562	-	-	-	-	-	-
Project Loans (Government)	641	106	1,022	531	74	262	-	141	-	-	-	-	-	-
Consumers Contributions	610	719	310	239	-	35	-	10	-	425	-	1,084	-	185
Total	3,240	1,730	2,298	2,949	340	1,390	-	713	-	425	5,758	7,187	-	185
Surplus (Deficit)	814	420	662	-352	-82	358	-6	149	122	259	146	-25	41	-29
Funds Accumulated	218	557	380	205	286	563	278	712	400	941	546	916	609	887
Debt Service Coverage	10.5	611	39.6	611	0.8	1.2	1.2	1.9	1.6	2.0	1.6	1.5	1.2	1.5

BOTSWANA

SECOND WATER SUPPLY PROJECT - LOAN 1763-BT

COMPLETION REPORT

Tariff Schedule 1982-1983

<u>Monthly Billed Quantity</u>	<u>Charges in Thebe per Kilolitre Gaborone/Lobatse/Shashe/Francistown</u>			
<u>Standard Tariffs</u>				
For the first 10 kl	24	23	23	25
For the next 20 kl	42	55	36	63
For the next 40 kl	56	84	42	82
For all in excess of 70 kl	49	70	37	75
<u>Special Tariffs</u>				
All water supplied for sandpipe delivery to the public, or to employees of special classes of consumer as approved in each case by WUC	23	23	23	25
For all raw or partially treated water supplied (from the Gaborone Works) for Agricultural purposes to consumers approved in each case by WUC	12	n/a	n/a	n/a
For all raw or partially treated water supplied from Selibe-Phikwe works in bulk	n/a	n/a	special tariff	n/a
For all water supplied to consumers at the Selibe-Phikwe new Industrial Area	n/a	n/a	53*	n/a

* Subject to variation in April each year.

BOTSWANA
SECOND WATER SUPPLY PROJECT - LOAN 1763
WATER UTILITIES CORPORATION
ECONOMIC RATE OF RETURN ON SHASHE/FRANCLSTOWN PIPELINE PROJECT ^{1/}

<u>Year Ending March 31st</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>	<u>1988</u>	<u>1989</u>	<u>1990</u>	<u>1991</u>	<u>1992</u>
Deflator	0	0.866	0.786	0.700	0.636	0.578	0.526	0.478	0.434	0.395	0.359	0.326	0.297
Annual Water Sales m ³ 10 ⁶ ^{2/}	—	—	—	1,148	1,400	1,440	1,600	2,000	2,400	2,700	3,000	3,300	3,600
Less Reaks supplied by wells	—	—	—	459	140	m1	m1	100	240	52	150	330	540
Sales attributable to project	—	—	—	589	1,260	1,440	1,600	1,900	2,140	2,648	2,850	2,950	3,060
Average Tariff in Thebe/kl	—	—	—	60	74	85	94	103	110	110	121	133	146
Total Revenue Attributable to Project 10 ³ P	—	—	—	413	932	1,224	1,504	1,957	2,354	2,913	3,449	3,924	4,468
Total Revenue Reduced to 1980 values	—	—	—	289	593	707	791	935	1,022	1,151	1,238	1,279	1,327
Construction Cost Project	28	1,068	2,989	960	505	33	—	—	300	—	—	—	—
Operating and Mintenance of Project (raw water plus prorata direct costs) ^{2/}	—	—	—	333	585	724	828	945	1,055	1,331	1,467	1,622	1,783
Total Costs (current prices)	28	1,068	2,989	1,293	1,090	757	828	945	1,355	1,331	1,469	1,622	1,783
Total Costs Reduced to 1980 values	28	925	2,349	905	693	438	436	452	588	526	527	529	530
Net Benefits	-28	-925	-2,349	-616	-100	269	355	483	434	625	711	750	797

^{1/} The return on investment, or economic rate of return (ERR), is taken to be the discount rate at which the present value of all capital and associated operating and maintenance costs(excluding duties and taxes) equals the present value of all revenues attributable to the investment over its economic life.

^{2/} Actual to 1983, and WUC Forecast to 1989 with extrapolation thereafter.

On the basis of the above revenues and cost streams the Economic Rate of Return = 11.7%.

Telephone: Gaborone 52521
Telex: 2545 BD
Postal Address: P.O. Box 127, Gaborone
In reply please refer to: UC 4/11/4 CS/pt

Dated: 12 June 19 86



SEDIBENG HOUSE
17530 LUTHUJI ROAD
INDUSTRIAL SITE
GABORONE
BOTSWANA

1986 16 1386

Mr Brian Shields
Chief
Energy, Infrastructure and Urban Development
Operations Evaluation Department
The World Bank
1818 H Street NW
Washington DC 20433
U S A

Dear Mr Shields,

Re: Project Completion Report on Botswana -
Second Water Supply Project (Loan 1763-BT)

1. Mr Commander and I thank you for your letter of May 22nd 1986 which we received here on the 4th June 1986. We have a few comments to make which we have detailed below, and if it would be of help these could be incorporated in the text of the PCR.
2. We are generally in agreement with the Report but there are one or two errors in detail which we suggest amending, and one omission i.e. Page 1, para. 1.02 'The Sector'.
 - (a) The Corporation was not created to take over the water supplies to the Gaborone/Lobatse area but was required to do so within a short-time.
 - (b) The Debswana mine management were responsible for the water supplies to Jwaneng until the Corporation assumed responsibility, not the DWA.
 - (c) The Corporation is already responsible for the public water supplies to all major townships in Botswana with the exception of Orapa.
3. Page 2 para. 1.07 'Bank Involvement in the Sector'
Suggest details of the project include 'construction of service reservoirs and pumping stations'.
4. Page 6 para. 3.04 'Revisions'
 - (a) The use of vertical shaft turbine pumps also resulted in increased construction costs and contractual claims for delay.
 - (b) The other error which occurred which is omitted from the PCR, is the fact that the Bank also insisted that the Dumela Industrial Area pumps be reduced in capacity. This was eventually reluctantly carried out, but the pumps were inadequate to meet demand and because of this have never been used. An alternative arrangement had to be devised, utilising the main booster pumping sets and partial gravity feed from the high level reservoir to meet the demands of the Area. This excessive interference in the details of project design pointed out earlier in the Report - page -

-V- 'Highlights' - fourth paragraph, relative to the vertical shaft turbine pumps, was also pertinent to the Dumela pumps, and resulted in abortive expenditure.

5. Page 8 para. 3.16 'Operations'
We suggest that mention be made of the problem relating to the Dumela pumps also in this paragraph.
6. Page 8 para. 3.18 'Performance of Consultants. Contractors. Suppliers and Borrower'
We suggest that mention again be made of the Dumela problem in this paragraph.
7. Page 10 paras. 4.01 and 4.02 'Operating Performance'
 - (a) Actual results to date indicate that the growth in water sales in Francistown has not occurred to the extent anticipated in earlier forecasts. (See also comment under Financial Performance below). The current WUC forecast has therefore scaled down the figures of estimated sales to a point where they are now more in line with the appraisal estimates.
 - (b) Page 10 para. 4.03

Slight variation in the wording of the PCR is suggested as the boreholes are only temporarily not in use. They will form an essential part of the Francistown supply as demand grows.
8. Pages 10/11 paras. 5.01, 5.03 and 5.06 'Financial Performance'
 - (a) The figures shown under the heading of 'Current Forecast' in the Income Statements Source and Application of Funds Statement etc, pages 1 and 2 of the Annex 3 to the Report, are in fact drawn from the forecast which was prepared in January 1984. The forecast is revised annually and although it is not suggested that the most recent figures be substituted at this stage, it should be borne in mind that the estimates shown are 2 years out of date. For example paragraph 5.03 states that 'current forecasts expect the average tariff to rise ----- to 110 thebe/kilolitre by 1988'. In fact the current average tariff in force for 1986/87 is 132 thebe/kilolitre.
 - (b) The equity interest of P90 000 referred to relates to Gaborone/-Lobatse Undertaking rather than Francistown. (para. 5.06)
9. Pages 14/15 para. 8.01 'Bank Performance'
 - (a) Suggest mention be made of increased costs due to design changes.
 - (b) Suggest that the wording include a note on the abortive expenditure on the Dumela pumps.
10. Pages 15/16 paras. 9.02 and 9.03 'Conclusions'
 - (a) para. 9.02

Suggest mention be made of the increased civil costs which resulted from changes in the design of the Shashe pumps and abortive expenditure on the Dumela pumps.
 - (b) para. 9.03

At present the Corporation has four Graduate Trainees in post. Two of these are being sponsored for professional accounting

qualifications and will be leaving to take full time courses overseas at the end of June 1986. The other two are graduate engineers and are being groomed to become Chartered Civil Engineers. It is proposed to recruit more graduates from the University of Botswana during 1986. The amount set aside for training in the Corporation's Annual Budget has increased sharply over the past two years. It must be borne in mind however, that having assisted staff to attain professional status they may be tempted away from the Corporation by the prospect of greater rewards in terms of both salary and fringe benefits in the Private Sector, even though they are 'bonded'.

11. We trust that these comments will be of assistance. They are being sent to you by courier so that you receive them as requested by 18 June 1986.

Yours sincerely,



C Sayles
Chief Executive