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The World Bank

Report No: ICR1644

IMPLEMENTATION COMPLETION AND RESULTS REPORT
(IDA-36640 IDA-36641 IDA-H2640 TF-21819 TF-51228)

ON

CREDITS AND GRANTS

IN THE AMOUNT OF SDR 16.9 MILLION
(US$ 25 MILLION EQUIVALENT)

TO THE

REPUBLIC OF TAJIKISTAN

FOR THE

DUSHANBE WATER SUPPLY PROJECT

December 29, 2011

Urban, Water Supply and Sanitation Unit
Central Asia Country Unit
Europe and Central Asia Region

CURRENCY EQUIVALENTS

(Exchange Rate Effective November 1, 2011)

Currency Unit = Tajik Somoni
1.00 = US$ 0.21
US$ 1.00 = 4.76

FISCAL YEAR
January 1 – December 31

ABBREVIATIONS AND ACRONYMS

CAS	Country Assistance Strategy
CBA	Cost-Benefit Analysis
DVK	State Unitary Enterprise Dushanbe Vodokanal (Dushanbe Water Utility)
DWSP	Dushanbe Water Supply Project
EMMP	Environmental Management and Monitoring Plan
ERR	Economic Rate of Return
GOT	Government of the Republic of Tajikistan
IDB	Islamic Development Bank
JSDF	Japan Social Development Fund
NAP WTP	Napornaya Water Treatment Plant
NPV	Net Present Value
PAD	Project Appraisal Document
PCU	Project Coordination Unit
PDO	Project Development Objective
PPP	Public Private Partnership
PO	Private Operator
PRA	Participatory Rapid Appraisal of Water Users
PRSP	Poverty Reduction Strategy Paper
PSA	Performance Service Appendix of the Service Contract
PSR	Project Status Report
RRF	Repair and Rehabilitation Fund
SAM WTP	Samotechnaya Water Treatment Plant
SC	Service Contract
TOR	Terms of Reference
WB	The World Bank
WSS	Water Supply and Sanitation

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REPUBLIC OF TAJIKISTAN
Dushanbe Water Supply Project (P057883)

IMPLEMENTATION COMPLETION AND RESULTS REPORT

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A. Basic Information			
Country:	Tajikistan	Project Name:	Dushanbe Water Supply Project
Project ID:	P057883	L/C/TF Number(s):	IDA-36640,IDA-36641,IDA-H2640,TF-21819,TF-51228
ICR Date:	12/30/2011	ICR Type:	Core ICR
Lending Instrument:	SIM	Borrower:	GOVERNMENT OF TAJIKISTAN
Original Total Commitment:	XDR 13.5M	Disbursed Amount:	XDR 16.8M
Revised Amount:	XDR 16.9M		
Environmental Category: B			
Implementing Agencies: State Unitary Enterprise Dushanbe Vodokanal (DVK)			
Cofinanciers and Other External Partners: Swiss Government (project preparation grant), Japanese Social Development Fund.			

B. Key Dates				
Process	**Date**	**Process**	**Original Date**	**Revised / Actual Date(s)**
Concept Review:	09/16/1999	Effectiveness:	10/31/2002	10/31/2002
Appraisal:	10/16/2000	Restructuring(s):		06/28/2010
Approval:	06/18/2002	Mid-term Review:	05/02/2005	09/19/2005
		Closing:	06/30/2007	06/30/2011

C. Ratings Summary	
C.1 Performance Rating by ICR	
Outcomes:	Moderately Unsatisfactory
Risk to Development Outcome:	Substantial
Bank Performance:	Moderately Unsatisfactory
Borrower Performance:	Moderately Unsatisfactory

C.2 Detailed Ratings of Bank and Borrower Performance (by ICR)			
Bank	**Ratings**	**Borrower**	**Ratings**
Quality at Entry:	Moderately Unsatisfactory	Government:	Moderately Unsatisfactory
Quality of Supervision:	Moderately Unsatisfactory	Implementing Agency/Agencies:	Moderately Unsatisfactory
Overall Bank Performance:	Moderately Unsatisfactory	**Overall Borrower Performance:**	Moderately Unsatisfactory

C.3 Quality at Entry and Implementation Performance Indicators			
Implementation Performance	Indicators	QAG Assessments (if any)	Rating
Potential Problem Project at any time (Yes/No):	Yes	Quality at Entry (QEA):	None
Problem Project at any time (Yes/No):	Yes	Quality of Supervision (QSA):	None
DO rating before Closing/Inactive status:	Moderately Satisfactory		

D. Sector and Theme Codes		
	Original	Actual
Sector Code (as % of total Bank financing)		
Water supply	100	100

Theme Code (as % of total Bank financing)		
Other urban development	100	100

E. Bank Staff		
Positions	At ICR	At Approval
Vice President:	Philippe H. Le Houerou	Johannes F. Linn
Country Director:	Motoo Konishi	Dennis de Tray
Sector Manager:	Stephen Karam	Motoo Konishi
Project Team Leader:	Pier Francesco Mantovani	Ede Jorge Ijjasz-Vasquez
ICR Team Leader:	Pier Francesco Mantovani	NA
ICR Primary Author:	Diego Rodriguez	NA

F. Results Framework Analysis

Project Development Objectives (from Project Appraisal Document)
The Project Development Objective (PDO) was to *improve the safety, reliability, efficiency, and financial viability of the water supply services in Dushanbe.*

Revised Project Development Objectives (as approved by original approving authority)
The PDO was not revised.

(a) PDO Indicator(s)

PDO indicators and target values were designed for the original 5-year project and remained unchanged for the Additional Financing period. Several indicators were identical to the performance indicators of the Service Contract (SC) under which DVK's operations were entrusted to a Private Operator (PO), as specified in the Performance Service Annex (PSA) of the SC. Shortcomings in SC execution impaired monitoring programs for some indicators.

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Indicator 1 :	**Safety**: % of samples achieving standard chlorine residual per the Performance Service Appendix (PSA) targets up to 95%			
Value quantitative or qualitative	70% as per Base Year Data Report	95%	NA	99.93%
Date achieved				06/30/2011
Comments (incl. % achievement)	Monitoring of this indicator only started in the 3rd year of the SC (2005) following DVK's failure to provide the sampling program to be implemented by the Private Operator. In 2005, the value of the indicator as measured by a PO developed sampling program was already 98.9%.			
Indicator 2 :	**Reliability**: Constancy of supply, as per PSA annual targets, up to 60%			
Value quantitative or qualitative	No baseline reported.	60% reduction in interruptions to be achieved by 6/30/2005	NA	Not measured
Date achieved				
Comments (incl. % achievement)	The program to control and monitor water pressures across DVK's network was not implemented, and no baseline or data could be measured on continuous supply vs. water supply schedule. Testimonial evidence, and gains recorded on indicator 3, suggest that reliability of service has substantially improved. However, customer surveys in May 2011 do not capture such gains, as 43% of users report less than 12 hours/day of service.			
Indicator 3 :	**Reliability**: Compliance with pumping schedule, as per PSA targets, up to 95%			
Value quantitative or qualitative	91.2%	95%	NA	94.7%
Date achieved				06/30/2011
Comments (incl. % achievement)	This indicator measures improved availability and pressure of service for the population (estimated at 27,000) living at or above the 5th floor of apartment buildings, and served by one of 109 booster stations. Despite the improvement, the result suffers from uncertainty due to the continued lack of accurate information on the number of inhabitants served in any DVK service area, and the lack of pressure zones in the system.			
Indicator 4:	**Efficiency:** Energy use reduction as per PSA annual targets (% reduction of electricity consumption (kilowatt hours per 1 million m3 of water production) from base year)			
Value quantitative or qualitative	0	- 25%	NA	+ 37.63%
Date Achieved				06/30/2011
Comments (incl. % achievement)	Substantial uncertainty affects this indicator, due to continued lack of metering of produced volumes. Despite improvements in energy efficiency measured between 2008 and 2009 (-7%) with the installation of new pumps, the energy efficiency objective was not achieved over the duration of the project.			

Indicator 5:	**Efficiency**: Reduction in water losses (m3/day reduction of physical losses measured from baselines of individual zones)			
Value quantitative or qualitative	Baseline numbers to be verified through Private Operator's audited Base Year data report.	Reduce water losses by 25,000m3/day	NA	21,100m3/day
Date achieved				06/30/2011
Comments (incl. % achievement)	The activities on leak detection and reduction were not conducted by the Private Operator. As such, this indicator, as reported, has been estimated by the M&E consultant and it is based on repair work conducted by DVK on leak reduction in every year starting in 2003. Given the rudimentary estimation, this result is not reliable. Actual water losses can be calculated with greater accuracy once macro and micro metering is installed and the network is zoned.			
Indicator 6:	**Financial viability**: Annual ratio of collected revenues/Sum of operational costs, adequate maintenance, and project related expenses.			
Value quantitative or qualitative	40% revenue collection as a percentage of operating costs	75% revenue collection as percentage of operating costs	NA	67.7%
Date achieved				2010
Comments (incl. % achievement)	Even though collection rates increased during Project implementation of the Program, these resources do not cover production costs nor operation and maintenance and DVK is incurring losses every year.			

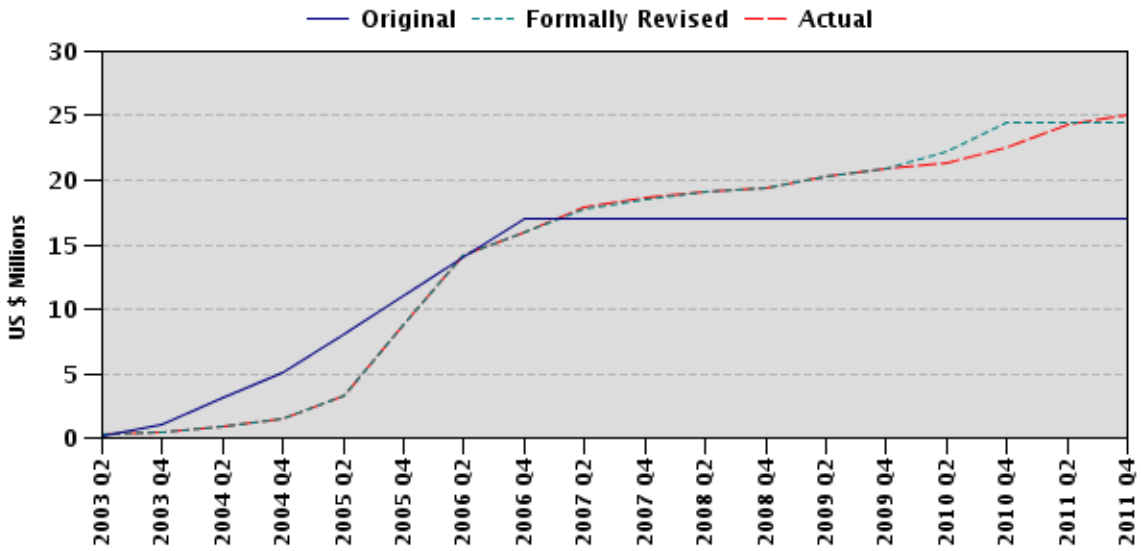
G. Ratings of Project Performance in ISRs

No.	Date ISR Archived	DO	IP	Actual Disbursements (USD millions)
1	08/19/2002	Satisfactory	Satisfactory	0.00
2	05/13/2003	Satisfactory	Satisfactory	0.26
3	08/07/2003	Satisfactory	Satisfactory	0.56
4	11/19/2003	Satisfactory	Satisfactory	0.72
5	06/29/2004	Satisfactory	Unsatisfactory	1.54
6	12/02/2004	Satisfactory	Unsatisfactory	2.77
7	12/23/2004	Satisfactory	Satisfactory	3.01
8	02/22/2005	Satisfactory	Satisfactory	4.19
9	11/06/2005	Satisfactory	Satisfactory	12.51
10	09/11/2006	Satisfactory	Satisfactory	16.91
11	12/10/2007	Satisfactory	Satisfactory	19.12
12	06/01/2008	Moderately Unsatisfactory	Moderately Satisfactory	19.23
13	12/15/2008	Moderately Unsatisfactory	Moderately Satisfactory	19.66
14	05/09/2009	Moderately Satisfactory	Moderately Satisfactory	20.65
15	11/29/2009	Moderately Satisfactory	Moderately Satisfactory	20.82
16	07/30/2010	Moderately Satisfactory	Moderately Satisfactory	23.67
17	10/05/2010	Moderately Satisfactory	Moderately Satisfactory	24.10
18	02/05/2011	Moderately Satisfactory	Moderately Satisfactory	24.81

H. Restructuring (if any)

The Additional Financing (Credit 3664-1-TJ, Grant H264-TJ for SDR 3.4 million) for the Project included an 18-month extension of the closing date from June 30, 2007 to December 31, 2008 to scale-up activities and enhance project impact. The Project was further extended in December 2008 by another 18 months to June 30, 2010 in consideration of implementation delays caused by the extremely cold winter of 2008 and to ensure adequate time for the re-design, re-bid and execution of a major contract introducing a new pilot water disinfection scheme. With this second extension, the maximum 3-year cumulative extension limit under OP/BP 13.20 had been reached. The Project was nevertheless further restructured on June 28, 2010 to extend its closing date to June 30, 2011. This exceptional extension was granted in response to externally caused delays for the transit into Tajikistan of foreign materials and equipment needed for two key contracts.

I. Disbursement Profile



1. Project Context, Development Objectives and Design

1.1 Context at Appraisal

1. Tajikistan became independent in 1991 upon the breakup of the Soviet Union. A civil war broke out in 1992 and continued until June 1997. A program of economic recovery and political stabilization ensued, supported by donors, including the Bank and the International Monetary Fund.

2. At the time of project approval in 2002, Tajikistan was the poorest country of the Commonwealth of Independent States, with a 2001 per capita Gross National Product of around US$160. Approximately 28 percent of the country's 6.3 million inhabitants were living in urban areas. Unofficial unemployment rate figures were as high as 33 percent and public spending had been severely restricted, with expenditures in the range of about 17 percent of Gross Domestic Product. Human development indicators had been declining and in 1997 UNDP ranked Tajikistan 115th out of 174 countries in this regard. The level of material poverty was very high, with four out of five residents considering themselves 'poor', a third 'very poor', and nearly a fifth 'extremely poor.'

3. The Dushanbe Water Supply Project (DWSP) was the first donor-funded operation in the urban water sector in Tajikistan. Water supply service at the hands of the Dushanbe Vodokanal State Unitary Enterprise (DVK) had suffered accelerated degradation since independence and through the civil war. Its situation at appraisal can be summarized as follows:

a. Poor service levels: Although the officially reported coverage of the water supply network was 90%, only a fraction of the population benefited from permanent service. Most parts of the city had intermittent supply about 10 hours a day. Further interruptions of supply were common due to equipment failures, lasting from a few hours to several days. Water quality was unsafe, and carried one of the highest risks of waterborne diseases in Central Asian cities. Insufficient water treatment and cross-contamination by sewage infiltrations were the likely cause of typhoid fever outbreaks in previous years, including in the winter of 1997 when 8,900 cases were reported. Highly turbid brown water would reach homes in the aftermath of big storms.

b. Inefficient operations. Water supply was extremely inefficient. In the absence of bulk and retail metering, it was estimated that about 60% of produced water was lost through network leaks, defective sanitary appliances and waste by consumers. Monitoring completed during Project preparation suggested that production levels approached an exceptionally high 1,400 liters/person/day, close to 10 times that common in Western Europe. Hydraulic losses in the network (measured as liters/connection/day per meter of pressure) were about 100 times the UK water industry average. With such level of wastage and losses, water production could meet demands, and untreated river water had to be pumped into the distribution system. Pumping was highly energy inefficient. On the sewerage side, high water consumptions resulted in overloaded sewers and wastewater treatment plant with diluted, difficult to treat, sewage.

c. Disrepair of assets. DVK facilities and networks were in a state of acute disrepair, due to inadequate design, low quality of materials and equipment, and, above all, lack of both preventive and corrective maintenance. As an example, with chronically out-of-service process units, 57% of the production of Dushanbe's main Samotechnaya (SAM) water treatment plant (WTP) consisted of untreated river water injected directly into the distribution network.

d. Unviable financial shortfalls. Extremely low tariff levels (US$0.004/m3 for domestic consumers in 1998) combined with very low collection rates (20% overall but only 2% from domestic consumers and about 40% of collections received in kind) kept DVK into a financial hole. With no choice but deferring payment to suppliers, DVK suffered major delays in delivery of supplies and had to ration energy consumption.

e. Lack of human resource capacities. The war had caused the departure of many technical staff in charge of utility operations. While DVK staff demonstrated great resourcefulness in coping with dilapidated systems, there was an urgent need to rebuild managerial and technical capacity.

4. The spiraling degradation of water supply in Dushanbe had reached emergency proportions and had to be reversed. The situation called for urgent and substantial water supply rehabilitation investments, as well as for drastic institutional capacity building and modernization. It was understood that such comprehensive upgrades would require multiple phases of financing. In order to accelerate the outcomes of a first investment operation, the Project was designed around a Public-Private Partnership (PPP). As strongly advocated by the Bank at the time, PPPs can, under the right conditions, be a preferred option to rapidly address the management, operational and financing needs of client utilities. Of various PPP options, the Service Contract (SC) was preferred, by which the responsibility for investment program implementation and for utility operations would be transferred to a private operator (PO) under a three year performance-based contract. Such approach was also proposed at the time for Uzbekistan's Bukhara and Samarkand Water Supply Project. Details as to SC scope and form are provided in Annex 2.

5. This pioneering design was ambitious, considering that PPPs were still an alien concept in Tajikistan. Sector stakeholders were yet at the beginning of a cultural shift to a market economy, and administration officials and utility managers had limited familiarity with commercial utility management practices. A fundamental bet of DWSP was thus that DVK would adjust and perform under new economic and governance rules, while embracing and implementing radical changes, with leadership and capacity building to be provided by a foreign private firm.

6. DWSP was prepared in about one year. It was approved by the IDA Board on June 18, 2002, almost 20 months after appraisal. The credit was declared effective on October 31, 2002 after completion of the PO recruitment process, and the SC commenced on December 1, 2002.

1.2 Original Project Development Objectives (PDO) and Key Indicators (*as approved*)

7. The PDO was to *improve the safety, reliability, efficiency, and financial viability of the water supply services in Dushanbe.*

8. The *PDO* would be achieved through: (i) Strategic rehabilitation and efficiency improvement of existing facilities in critical condition; (ii) Institutional strengthening of DVK through a performance-based Service Contract (SC) with an internationally experienced water utility operator (the Private Operator, or PO); and (iii) Strengthening of DVK's financial capacity through improved financial management and commercial practices.

9. The key indicators selected to measure progress towards the PDO were as follows:

- Safety: Percentage of water samples complying with chlorine residual standard;
- Reliability: Continuity of service and compliance with water supply schedule;
- Efficiency: Reduction in energy use per m3 of water; reduction in water losses; and increase in accounted-for water; and

- Financial Viability: Collection of revenues; annual ratio of collected revenues over the sum of operation and maintenance costs and project-related expenses.

1.3 Revised PDO (as approved by original approving authority) and Key Indicators, and reasons/justification

The PDO and the indicators were not revised during project implementation.

1.4 Main Beneficiaries

10. The final beneficiaries were identified as the people of Dushanbe connected to the water supply system. The key identified benefits were the improvement in safety and reliability of urban potable water supply. Given the high level of connection to the water network, such improvements would benefit a great majority of the population, including its poorest segments.

11. The intermediate beneficiary was DVK. The involvement of an experienced private sector operator would bring better management, as well as operational and technical know-how. Furthermore, the policy and institutional changes advanced by the Project would help DVK take the first steps in a gradual path towards self-sustainability, technical efficiency, financial viability and support capacity building in all aspects of utility management and operation.

1.5 Original Components (*as approved*)

The Project consisted of five components:

12. *Component 1: Repair and Rehabilitation Fund (RRF) (USD 13.09 million).* This component funded essential short-term expenditures (such as operational equipment, vehicles, computer hardware and software) and a least-cost capital investment program to be designed and implemented under the responsibility of the PO. The investment program was aimed at i) improving operations of the water supply system, ii) reducing water losses, iii) improving the network operations, iv) implementing a metering program, v) improving the quality and safety of water, and vi) achieving the performance improvement targets of the SC. The PO, together with DVK staff, would propose the investments to be funded under this component, implement a demand management program and set up financial management, accounting and commercial systems. An initial set of investments (the Immediate Investment Program) was identified, estimated and designed by DVK and its consultants during project preparation for implementation in the first year of the SC, as a means to accelerate project implementation. Annex 2 summarizes the actual outputs of this component.

13. *Component 2: Service Contract (USD 5.43 million, of which base fee USD 3.25 million, incentive fee USD 0.5 million, and local taxes 1.68 million)* This component financed the costs of the SC, including a base fee and a performance-based fee linked to the achievement of contractual targets. The PO was given full responsibility for managing DVK personnel in the water supply and financial areas, defining and implementing the demand management program, as well as the new billing and collection, and the financial management systems.

14. *Component 3: Consulting Services to the Project Coordination Unit (USD 0.19 million).* This component financed consulting services to support the Project Coordination Unit (PCU) in its supervision of the PO's performance and compliance with the terms of the SC. It included independent auditors that would support the PCU in its monitoring of the PO's performance and prepare the necessary project and DVK financial audits; and other consulting and legal advisory services as needed.

15. *Component 4: Project Coordination Unit (USD 0.32 million).* This component financed the operating expenditures of the PCU for project management. It covered communications, utilities, printing and publications, office rent, maintenance and supplies, office security systems, vehicle operation and maintenance, transportation and field trip expenses, training of PCU staff for purposes of Project management, remuneration for staff, including qualified social charges but excluding salaries of civil servants.

16. *Component 5: Refinancing of Project Preparation Facility (PPF) (USD 0.40 million):* This component refunded the PPF advance used for PCU establishment, final designs and bidding documents of the Immediate Investment Program, implementation of the financial management system, procurement assistance, and training.

1.6 Revised Components

17. No revisions were made to the original components. New components were added as part of the Additional Financing (AF) in 2007, in the amount of a grant of SDR 1.02 million (US$1.5 million equivalent as of November 2006) and a credit in the amount of SDR 2.38 million (US$3.5 million equivalent as of November 2006). The Borrower requested the AF to scale up activities, including: (i) the purchase and installation of hypo-chlorination equipment for disinfection of water at SAM WTP; (ii) the rehabilitation of rapid sand filters at Napornaya (NAP) WTP; (iii) procurement of additional equipment to complement ongoing works, in particular, for rehabilitation of about 60 booster stations; (iv) provision of technical assistance to DVK; and (v) assistance to project management. The scope of the AF components is detailed in Annex 2. Most importantly, AF implementation arrangements did not include a new SC, and implementation of infrastructure investments was entirely entrusted to locally hired PCU staff and consultants.

18. The allocation of additional financing was as follows:

Category	Amount of the Credit Allocated (in SDR)	Amount of the Grant Allocated (in SDR)	% of Expenditures to be Financed
(1) Works	476,000	204,000	88%
(2) Goods	1,285,200	550,800	88%
(3) Consulting Services, incl. audits	333,200	142,800	88%
(4) Operating Costs	71,400	30,600	88%
(5) Unallocated	214,200	91,800	
TOTAL	**2,380,000**	**1,020,000**	

1.7 Other significant changes

n/a

2. Key Factors Affecting Implementation and Outcomes

2.1 Project Preparation, Design and Quality at Entry

19. The Project was prepared with the help of a grant by the Swiss Government to DVK. The Project was highly relevant to the priorities of GOT at the time of appraisal, such as improving poor levels of service, inefficient operations, disrepair of existing facilities, prevention of waterborne diseases, and severe financial shortfalls of DVK.

20. The PPP approach was consistent with the Bank's strong advocacy of private sector involvement in the WSS sector at the time, as well as with the goal of achieving a fast turnaround of DVK's performance and of maximizing the impact of investments in terms of operational improvements. In this regard the choice of the SC model was fundamentally sound, and was thoroughly developed and adapted to DVK needs with relevant expert support. SC design opted to have about 14% of the pre-tax contract value as an incentive-fee, linked to performance against multiple efficiency parameters or completion of specific deliverables. This important contract form feature was however undermined by the assumption that the indicator baseline could be established in the first year of the Project by PO in partnership with DVK.

21. In hindsight, although few efforts were spared in designing a high quality SC, preparation did not achieve sufficient client ownership and readiness for SC implementation. This may have been particularly true at the Municipality level, a fact evidenced by client insistence to limit SC costs and to curtail SC duration to three years out of a total five-year Project duration. Client ownership of the PPP approach, their acceptance of SC costs, their political will to effectively transfer operational responsibility to the PO while increasing the autonomy of DVK, and their ability to abide to agreed procedures and roles, were indeed overestimated. At the same time, the challenges and risks associated with the governance and operational limitations of client organizations were not recognized or mitigated to their full potential.

22. The assessment of existing infrastructure systems and operations was thorough, including for the evaluation and characterization of massive unaccounted-for water volumes. Project design may however have underestimated investment and technical assistance needs. The RRF proved underfunded, possibly incompatible with achieving all project objectives. As an example, the RRF did not allow to cover the rehabilitation needs of SAM WTP critical for water supply quality and reliability, and could only fund a marginal metering program. Budget arbitrages may also explain the curtailing of the SC to a3-year duration. By most standards, such SC duration was excessively short, inconsistent with the infrastructure and operational efficiency objectives of the Project..Insufficient funding was partly compensated by fostering the mobilization by DVK of parallel financing by the Islamic Development Bank (IDB), for rehabilitation investments to be integrated under PO oversight. IDB funding thus helped decisively upgrade the SAM sedimentation ponds, but did not materialize for the critical renewal of SAM filters.

23. The general lack of data at appraisal explains some of the shortcomings with regards to baseline and target information on some of the Project's performance indicators. For example, the indicator on the percentage of hours per month during which consumers drew water from the system measure turned out to be too laborious to measure, and could not be determined by the PO or DVK. Moreover, the lack of clear network zoning and of macro and micro metering resulted in other key indicators being unreliable.

24. The Government and the Bank also agreed to unusual onlending conditions that resulted in putting added stress on DVK's financial sustainability. Under the financing and subsidiary agreements, GOT on-lent IDA's credit and grant funds to DVK as a loan in US dollars, with a mark-up interest rate that would gradually increase to 5% during the first 10 years of repayment. This was imagined to provide an incentive for DVK to behave as a commercial entity. However, with the SC failure, the assumptions of increased revenue, cost recovery and managerial capacity did not materialize. The substantial debt service obligation in US dollars is depressing DVK's financial sustainability, and is paradoxically perpetuating DVK's inability to invest in maintenance, rehabilitation and modernization.

25. Despite the mobilization of a highly qualified team of water supply and PPP experts, consultants and reviewers, and the organization of thorough Project preparation assessments and participatory processes, the pressure to deliver a complex project in a relatively short time limited the team's ability to appraise the Project conservatively, and to achieve a higher level of risk mitigation and client ownership. Substantial performance assumptions were made in order to appraise the Project which did not materialize.

In retrospect, despite a technically very solid preparation effort, the Project was probably challenged at entry, pursuing a broad and ambitious PDO, in a risky low capacity and governance context, with fragile implementation arrangements and arguably insufficient investment budget and implementation time.

26. **Incorporation of Lessons Learned.** At preparation, the Bank had limited experience in implementing infrastructure programs in Tajikistan. Prior Bank financing had indeed concentrated primarily on emergency operations (the Post Conflict Emergency Reconstruction Project and the Emergency Flood Assistance Project). The Project Appraisal Document (PAD) explains how DWSP preparation built on lessons from those ongoing operations, including: (a) the need for high-level support and political commitment from the outset for both policy reforms and project design; (b) the acknowledgement that institutional reforms would require significant time to be achieved; and (c) the emphasis from the beginning on project staff development and training to improve the overall understanding of project management issues.

27. The team also drew from the Bank's experience with the implementation of infrastructure projects in other transition economies. According to the PAD, the Bank team was prophetically aware of how important certain preparation and design lessons would be for DWSP outcomes. Whether effectively applied or not, the following precautions were listed in the PAD:

- Continuous interaction with DVK, the Municipality and other stakeholders during preparation was indispensable to achieve good ownership by the Borrower of project approach, needed reforms, and Bank procedures.
- Project sustainability would depend on realistic projections of the minimum financial capabilities of the utility, and in turn on the commitment by the municipality to support a financial recovery plan based on higher billings and collections and commensurate tariff increases.
- Expectations for this first operation in the sector had to be modest. DVK would need further support even after the successful completion of this Project, and the institutional improvements would place DVK in a position to attract and absorb further assistance from IDA and other donors.
- The involvement of an international PO with adequate delegation of management, operational, and capital program responsibilities, combined with clear financial incentives to achieve the performance targets, could provide significant service improvement, utility performance and capacity building benefits, if the Government and the utility supported this approach.
- Implementation arrangements should be clearly defined and understood. During project preparation, the roles of the Municipality, the PCU, the PO, and DVK had been reviewed and agreed. The SC had been discussed, reviewed and finalized by the Coordinating Committee, DVK and PCU. The contract would clearly specify roles and responsibilities of all parties.
- The institutional and policy reforms required for the success of the SC and of the Project needed the involvement and support of the authorities with clear shows of commitment during preparation. By implementing the first steps of the reforms prior to project implementation the Government had not only demonstrated its commitment but would also facilitate the transition to PO management and operation of the water supply system.

Risk and Mitigation.

28. At appraisal, the Bank was aware that despite all its preparation precautions, the Project entailed a fundamental rejection and underperformance risk given the magnitude of the changes it introduced. The following PAD excerpt captures such awareness, as well as the Bank's capacity to take on risk in the absence of better alternatives: *"Although the Project preparation process was designed to create an understanding of the reasons why the reforms proposed were essential for sustainable improvements of*

service, continued Bank leadership and support will be needed during implementation to strengthen and maintain the existing commitment and interest. Under this project, DVK would embark on a venture for which they are very poorly prepared in terms of experience and mind set. Turning over management and operations to a foreign company at high cost, introducing higher tariffs and enforcing collections, and investing in rehabilitation and maintenance rather than in capacity expansions, constitutes a complete break with old traditions and requires a large leap of faith".

29. As suggested above, the risks presented in the PAD were reasonably well defined, relevant and comprehensive. Given the pioneering nature of the operation, the obviously major risk stemming from DVK's limited capacity, including for Bank procedures, should have been given a "substantial" or "high" rating.

30. Project design was centered on the SC as sole means to rapidly achieve operational efficiency and management performance objectives. It assumed that the conflicts expected to arise in SC implementation could be mediated. No "Plan B" measures were in place for the case of premature end of the SC or for the case SC duration were confirmed insufficient and had to be extended.

31. Project preparation did not, and arguably could not, predict the extent to which the Municipality would assert its de facto control over Project implementation by DVK, despite the Government's and the Coordination Committee's original commitment to institutional reform. Although assurances were received during appraisal that the Municipality would increase DVK autonomy and limit political interference, the likelihood of such governance gains should have been rated low. The lack of autonomy of DVK, and the Municipality's objection to SC extension are two factors, among several others, that impaired Project success. In hindsight, disbursement conditionality might have mitigated some of these risks.

Participatory Processes

32. Civil society and community participation processes were adequate. As part of project preparation, a social assessment study entitled Participatory Rapid Appraisal (PRA) of Water Users was carried out in the second semester of 1999. The main objective of this study was to determine user's perceptions of the quality of the water and sewerage system in Dushanbe and their willingness to contribute to improvement of the water supply service. Specifically the study identified users' spending on water, water user problems and the users' willingness to solve them; users' willingness to contribute in cash or in-kind for improvements and maintenance of services; and institutional mechanisms for consumers to take responsibility for repair and maintenance.

33. In terms of participatory approaches, the Project was prepared in close collaboration with the municipal authorities (Hukumat), DVK, local experts, traditional neighborhood groups (mahallas), consumers, beneficiaries, and the Bank team. A water user questionnaire was jointly prepared with the Director of DVK, PRA consultants, and the Bank team. The participants included mahalla committees, household users, elders in the community, DVK engineers, and teachers. The preliminary results were discussed with DVK and the Municipality in a workshop. The final results of the PRA were presented to key stakeholders (including officials from various government organizations, the municipality and the media) in a project preparation workshop in March 2000. Shortly after and up until project approval, the PCU had been preparing periodic reports for the media on project preparation.

34. The PRA was conducted in 22 communities of Dushanbe by six researchers all of whom were members or leaders of local NGOs or mahalla committees. Residents of 22 mahallas participated in the PRA and in the mapping exercises to identify leakage and water problems in their localities.

2.2 Implementation

35. Although DVK was the Project Implementing Agency, project implementation was led by a Project Coordination Unit (PCU) independent of DVK, established by the Municipality (owner of DVK and ultimately responsible for service provision) to manage the Project and coordinate Project activities with DVK. Staffed by local consultants and resident within DVK, the PCU had overall responsibility for project implementation, including fiduciary management, administration of the Service Contract, supervision of the Immediate Investment Program and the RRF, and monitoring and evaluation. The PCU would report to the Municipality and to a Project Coordinating Committee which included representatives from various government organizations, including the Ministry of Finance. The PAD stated that DVK would operate as a legally separate, financially self-sufficient, municipally-owned enterprise.

36. The PO would be responsible for managing DVK's water supply services under a three-year performance-based service contract, preparing the investment program, and building DVK's capacity. The PO would carry out the procurement of goods, works and services in accordance with the Bank's guidelines. Ownership of the assets would remain with DVK whereas the Municipality and the Government would retain policy and regulatory authority, including for setting tariffs.

37. Implementation started at a good pace with the hiring of a consortium composed of MVV Energie AG and HYDROPLAN to execute the 36 month SC. According to the contract, the consortium was responsible for 76 discreet tasks to: i) improve water quality and supply continuity through loss reduction; ii) reduce of energy consumption through increase in energy efficiency of the treatment facilities and improved management of those installations; iii) improve financial viability by introducing appropriate tariffs; improving collection revenues by maintaining strict cost controls in order to improve the annual ratio of collected revenue over the sum of operating expenses and project-related costs; iv) strategically rehabilitate and improve the efficiency of existing facilities, and v) ensure general institutional strengthening of DVK.

38. The Project benefitted from generally constructive technical cooperation between PO, PCU and DVK. Disagreements and control issues emerged however on utility management priorities and Project procurement processes, also involving the Municipality, and which began to seriously affect the Project implementation in its second year. Because of the particular authority embodied by the Municipality of Dushanbe, oversight and mediation efforts by the Government and the Bank supervision team were not effective at improving the partnership. A degraded contractual relationship with DVK and the Municipality, as well as budget constraints eventually led to non renewal of the SC, despite the fact that the Project situation may have required such extension.

39. Key issues experienced in project implementation include:

a. *Implementation delays associated with procurement*. Procurement was a major source of delays in project execution. At the time of ICR formulation and based on the procurement post review conducted in 2007, the PCU had adequate procurement capacity. Such capacity did not however prevent chronic delays in contractor selection and in contract issuance, as well as inconsistencies in contract monitoring and administration (several sanctions had to be applied to many contracts to suppliers for non compliance). Serious weaknesses in the supervision of the contracts were also found in the review, affecting the quality or viability of some project outputs.

b. *Institutional incentives and limitations*. Cooperation from DVK in providing the necessary information to the PO and in effectively transferring the management of its operations, as stipulated in the SC, was reported as not ideal, and a factor of major SC implementation delays. Government's support for the PPP approach during preparation was not ideally sustained when

implementation difficulties arose. Also, limitations in PCU's project management expertise, particularly for works supervision, contributed to several delays.

c. *Service contract performance and non-renewal.* In effect, the SC was not renewed after its third year due to: i) general dissatisfaction by the Municipality with SC costs, processes, performance and "value for money"; ii) institutional resistance by DVK preventing the PO from effectively taking over the management of the utility; iii) lack of cooperation from DVK to provide the PO with all necessary baseline information and data; iv) uneven qualification and high rotation of PO team, which reportedly included insufficiently experienced staff, and (v) Project budget constraints. With regards to Project investments, and despite adequate PCU capacity, the PO's prioritization and implementation prerogatives, including for management of procurement processes, were often challenged by solutions and approaches advocated by DVK or the Municipality, often leading to substantial disruptions and delays in procurement decisions. With regards to improving DVK's operational performance, the PO was never allowed to take on its contractual utility management responsibility, and only operated as a technical assistance team. Despite reportedly good technical cooperation between PO, DVK and PCU, PO performance and SC circumstances led to non-completion of several of the SC's assigned tasks and to the delivery of some unsatisfactory reports and plans. From the PO's perspective, in addition to a difficult operating environment, the SC lost commercial interest from the moment the incentive fee proved elusive, in part for reasons linked to lack of complete or consensual baseline data. Against this background, Bank supervisory efforts were not effective at improving SC outcomes, and at reversing a growing rejection by the Municipality rooted in the perception that PO staff were too costly, too rigid and did not deliver "value-for-money". A factual insights and details of PO performance are provided in Annex 7. In all, the conflicted SC was in place for only three years of the original 5-year project duration and for none of the 4-year Additional Financing.

d. *Limited project management and supervision capacity.* From lack of a planned alternative, the non-renewal of the SC had a deeply detrimental effect on the Project. During the procurement and construction-heavy 2006-2011 period, Project management and supervision only relied on limited PCU and DVK capacity and expertise, without the benefit of independent international consultants. The procurement of an array of contracts was disrupted, project management, quality of design and supervision were impaired, and independent monitoring ceased. DVK furthermore lost all assistance to improve utility management and financial outcomes. No Project restructuring was undertaken despite such compromised conditions.

e. *Inefficient Project governance.* Project management inefficiencies were compounded by DVK's and PCU's lack of autonomy. At appraisal, strong political commitment seemed to support the recommendation that DVK should become an autonomous institution. During implementation however, the Municipality, although not an explicit party in the credit and project agreements, asserted its role as arbiter for most key Project issues, with absolute control over DVK and PCU. While such interventions were alleged to compensate for weak DVK and PCU leadership, they also resulted in ineffective Project communications, non-transparent and occasionally non-optimal operational and procurement decisions, and in disempowerment of professional managers.

f. *Tariffs were increased on* several *occasions but the increases were well below required levels*. As shown in Table 1, in most cases and particularly since 2008, tariff increases primarily reflected the large increases in energy costs. In real terms, taking inflation into account, these increases were minimal. Therefore, DVK registered net operating losses as its tariff revenues were not sufficient to keep up with inflation and cover operating costs, making the company progressively more dependent on financial support from the Municipality or on deferred payment of maintenance costs, suppliers and services.

Table 1: Tariff Rates and Setting for Water and Sanitation

Indicators by categories	Unit	2002	2003	2004	2005	2006	2007	2008	2009	2010
Population										
Tariff rate per m³	Somoni	***1,5***	***2,3***	***3,9***	*3,9*	*3,9*	***6,5***	***15,4***	***17,2***	***19,3***
Water	Somoni	**1**	**1,5**	**2,5**	2,5	2,5	**4,2**	**10**	**11,8**	13,9
Sewage	Somoni	**0,5**	**0,8**	**1,4**	1,4	1,4	**2,3**	**5,4**	**5,4**	5,4
Budget organization	Somoni									
Tariff rate per m³	Somoni	***3***	***4,5***	***13,9***	*13,9*	*13,9*	***22***	***49***	***54***	***60,3***
Water	Somoni	**2**	**3**	**8,7**	8,7	8,7	**14**	**30**	**35**	41,3
Sewage	Somoni	**1**	**1,5**	**5,2**	5,2	5,2	**8**	**19**	**19**	19
Commercial org.	Somoni									
Tariff rate per m³	Somoni	***15***	***18***	***45,1***	*45,1*	*45,1*	***71***	***125***	***135***	***142***
Water	Somoni	**10**	**12**	**27,9**	27,9	27,9	**45**	**75**	**85**	92
Sewage	Somoni	**5**	**6**	**17,2**	17,2	17,2	**26**	**50**	**50**	50

Table 2: Indicators on Income and Expenditures (thousand TJS)

Indicators	2002	2003	2004	2005	2006	2007	2008	2009	2010
Total income	**1316**	**2959**	**4351**	**7798**	**6966**	**9229**	**15772**	**41558**	**19983**
Receipt of sales	1054	2781	3890	7751	6621	8813	14314	**18532**	19965
Other incomes	262	178	461	47	345	416	1458	**23026**	18
Expenditures									
Salary			864	2193	1796,8	2022	3320	**4048**	4323
Social fund allocation			216	548	449,2	506	830	**1012**	1081
Materials			487	1249	1193	1065	1967	**1626**	1585
Spare parts					168,6	145	589	**610**	555
Electrical energy					1479	1665	3723	**4322**	3994
Fuel and lubricating					490	982	1890	**1175**	1221
Charges, taxes					89,4	368	741	**1338**	1528
Other operational costs					1994	2661	3600	**3339**	2248
Administrative costs					2666	2011	2654	**1843**	957
Other expenditures					324	482	0	**0**	0
Total of operational costs					**10650**	**11907**	**19151**	**19313**	**17492**
Depreciation of fixed assets					2772	4717	4792	**5102**	9818
Total:					**13422**	**16624**	**24105**	**24415**	**27310**
Interest and financial expenditures					4506	1233	860	**20094**	2576
Total expenditures	**5207**	**6858**	**9336**	**15425**	**17928**	**17857**	**24965**	**50047**	**29886**
Income (loss)	**-3891**	**-3899**	**-4985**	**-7627**	**-10962**	**-8628**	**-9192**	**-8489**	**-9903**

g. *Financial shortcomings*. As summarized in Table 2, the financial standing of DVK did not improve during the Project. Even though collections increased considerably (from 22% in 2002 to 95% in 2009), the low billing performance, the high level of undeclared customers and the inadequate tariff structure, coupled with increasing costs, have resulted in income losses in every single financial year during project implementation. In nominal terms, income losses more than doubled over the life of the Project. This situation may worsen with the need to sustain the

operation and maintenance of rehabilitated facilities, unless new efforts are devised to curb water demands and to ensure revised tariff, billing and collection policies.

40. In addition to the financial shortcomings due to insufficient revenues and losses in operating income, the Project also faced shortages due to delays in the provision of the Government's counterpart funding which affected the availability of resources to cover responsibilities in existing contracts.

2.3 Monitoring and Evaluation (M&E) Design, Implementation and Utilization

41. The PAD stated that the PCU, with the support of international independent technical and financial auditors, would monitor progress against agreed performance indicators specified in the SC. One of the tasks given to the PO under the SC was the implementation of monitoring mechanisms to gather the necessary technical data to better manage the water supply system. This data would also serve as the basis to determine performance improvements in a way that could be independently verified by auditors. The PO was supposed to furnish the PCU with monthly, quarterly and annual reports summarizing SC operations and the utilization of projects funds. The PCU would provide to the Project Coordination Committee and IDA quarterly consolidated reports on implementation progress covering: (i) projections for project financing and implementation; (ii) status of project finances, procurement of goods and works; (iii) status of implementation of the Immediate Investment Program and the Repair and Rehabilitation Fund; (iv) statement of income and expenditure for the current and previous quarter; and (v) monthly cash flow projections for the next six months.

42. One of the shortcomings of this M&E approach was that it was designed primarily to be implemented and monitored by the PO. DVK's inability, and in some instances reported reluctance, to provide all necessary data to the PO, affected implementation of the indicator frameworks. For several of the indicators, the lack of reliable information made calculations and reporting very difficult, none more so than the lack of bulk or retail metering of distributed water. Because of the requirement for consumer surveys, the indicator pertaining to continuity of service could never be measured during the life of the Project. Upon non renewal of the SC, the responsibility was transferred to DVK/PCU, whose M&E capacity was seriously limited. An M&E consultant was eventually hired by the PCU which greatly improved the collation and tracking of indicators. Under the circumstances, the M&E of performance indicators gradually lost any value as management tool for DVK to improve operations, and soon became just another reporting requirement of the World Bank.

2.4 Safeguard and Fiduciary Compliance

43. *Financial management*: Financial management was identified as a key weakness during project preparation, and a Financial Management Assessment was undertaken at appraisal to agree on an action plan to ensure that the Project had in place a financial management system, including internal controls, accounting and reporting, satisfactory to the Bank. With this action plan, the Project introduced new financial management practices to DVK and provided capacity building activities that resulted in upgrading key aspects of DVK's financial management system that addressed the shortcomings.

44. Based on the February 2011 supervision mission, the rating of financial management arrangements at the PCU, including accounting and reporting, internal control procedures, planning and budgeting, external audits, flow of funds, organization and staffing arrangements was upgraded to moderately satisfactory. The mission corroborated that several improvements and measures were undertaken including: (i) The use of the "1C" accounting software by the PCU. The PCU had started entering transactions on January 1, 2010. However, PCU could not manage to invite the current 1C Consultant Firm to modernize and update the program for reasons which depend on SUE "DVK". As

result, the 1C accounting software is not able to generate all required reports; (ii) The PCU introduced the practice of verifying both interim financial reports and withdrawal applications before submission to the Bank. As result the discrepancies between accounting and reporting teams have been eliminated; and (iii) Procurement of the external hard disk for the accounting team by the PCU has allowed the Acting Chief Accountant to perform back up of Excel files and 1C accounting software each month. Due to GOT delays in replenishing counterpart funding, the hiring for the position of the CA was delayed, nevertheless the PCU was able to submit its quarterly Financial Management Reports on time and they were found satisfactory to the Bank. Because of this the Financial Management rating was temporarily downgraded but has since been gradually upgraded, and reached Moderately Satisfactory at project closing.

45. *Procurement.* At the time of appraisal, Tajikistan was considered "high-risk" with respect to procurement. The general procurement environment was not conducive to fair and transparent processes. Given that the PCU had no experience in Bank procurement, a Capacity Assessment of the Borrower was prepared. PCU capacity was strengthened by the hire of a Procurement Officer. However, the assessment mentions that the PO, not the PCU would be responsible for major procurement duties. By 2004, several delays, mostly related to procurement of several individual contracts, had occurred, putting Project behind schedule. Throughout the life of the Project, several disagreements occurred between PO, Municipality, DVK, PCU, and World Bank supervision teams, causing additional delays to project implementation.

46. *Environmental Aspects.* Potential environmental impacts and appropriate mitigation measures were assessed during preparation. An Environmental Management and Monitoring Plan (EMMP) prepared in 2000 assessed significant environmental and health benefits, such as improved public health through better quality and availability of treated water, improved sustainability of raw water sources through reductions in losses and wastage. Potential impacts of the Project would relate to: (i) inappropriate disposal of water treatment sludge; (ii) safety hazards of the chlorination process; (iii) pollution by construction run-off; (iv) disturbance during construction including dust, noise, vibration, access restriction, closure of roads, and increased traffic; (v) improper disposal of demolition debris; (vi) damage to existing utility services during pipe repairs and installation; (vii) safety hazards from construction activities; (viii) spillage of fuel and oil from construction; and (ix) damage to trees and vegetative cover. All negative environmental effects could be minimized through appropriate mitigation measures, compatible with normal construction and operation practices. The EMMP was updated in 2006 and closely monitored by the PCU during implementation.

47. *Social Aspects*. One of the recommendations of the social assessment was that efforts to improve the supply of water and maintenance of facilities be focused both internally (household and mahalla level) and externally (repair of infrastructure and improvement of the managerial and technical capacity of DVK). The assessment also recommended that the organization of mahalla committees and other community-based organizations be supported so that they may contribute to the coordination with DVK, to fee collection, and to repairs of the internal plumbing system.

48. In order to internalize such recommendation into project tasks, the Government requested a grant from the Japan Social Development Fund (JSDF). The grant begun implementing in March 2003 and closed in May 2007. The total amount of the activity was USD 2,635,130 of which JSFD financed USD 2,318,660. The main objective of the grant was to improve the reliability and quality of water supply services for poor residents of Dushanbe city through the creation of Water User Associations (inaccurately called "homeowners associations) and the rehabilitation of old water supply systems inside multi-apartment blocks and private houses. The Project consisted of the following components: a) capacity building of communities in the management of the communal water distribution systems in multi-apartment blocks and private houses; b) small civil works and materials for repair of water distribution systems; c) training of communities and capacity building of community associations.

49. At grant closing, 42 Communities had been created in Dushanbe and 4 Communities had been strengthened. The JSDF grant provided support in 414 multi-apartment blocks; 19,480 apartments; 566 private houses; and 50,053 residents of Dushanbe, representing approximately 9% of the city's inhabitants. A total of 46 rehabilitation subprojects were implemented in the Communities. The grant was successful in setting several homeowners associations and in rehabilitating water supply systems in private dwellings. However, these communities were not sustained and they no longer have a clear existence nor are they formally recognized by the DVK. It is recommended that these types of models be carefully assessed, for replication, as a viable mechanism to influence behavior of private agents.

50. The JSDF grant was the main social outreach program that DVK undertook. There were no more significant stakeholder consultations, with the exception of the final customer satisfaction survey. Any new phase should emphasize mechanisms to engage more proactively with customers.

2.5 Post-completion Operation/Next Phase

51. Significant rehabilitation and capacity building needs remain to be addressed by DVK through ulterior investment phases. The most screaming need, which alone justifies continued support to DVK, is the fact that Dushanbe's main SAM WTP still lacks filtration capacity. Despite very substantial and strategic DWSP infrastructure improvements, no substantial or lasting gain has been made to improve DVK's sustainability through operational efficiencies and cost-recovery. The Project ends in particular without clear reductions in water demands or energy consumptions, nor any effective modernization of billing and collection systems. Cost-recovery and reforms needed for DVK's autonomy remain elusive.

52. These infrastructure, capacity and institutional shortcomings must be addressed by ulterior investment phases. Residual investment needs include in particular (i) SAM WTP filters renewal, (ii) NAP pump station and reservoir rehabilitation, (iii) System-wide bulk and retail metering program, (iv) Network renewal and establishment of pressure zones, and were estimated at about USD40 million in a 2010 feasibility study. At the time of ICR completion, a USD19 million follow-up operation (Second Dushanbe Water Supply Project) is being launched, funded by a USD16 million IDA and by USD3 million cofinancing loan by the Municipality , which is aimed at fulfilling the most urgent of these needs. Dushanbe's wastewater collection and treatment systems, also operated by DVK, feature massive rehabilitation needs, which for the moment do not benefit from any donor support.

3. Assessment of Outcomes

3.1 Relevance of Objectives, Design and Implementation

53. The Project was clearly aligned with the Country Assistance Strategy (CAS) of 1998. The objectives of the Bank's assistance, as outlined in the CAS were: (a) implementing the peace process and strengthening institutions for conflict resolution and achieving social goals; (b) achieving a successful transition from a planned economy to a market economy and achieving macro-economic stability; (c) carrying out essential structural reforms and reducing poverty; and (d) rehabilitating infrastructure and restoring basic services, particularly in the areas of education and health.

54. The CAS identified the rehabilitation of the degraded water supply infrastructure, linked to recurrent outbreaks of typhoid fever, as a critical need for the improvement of public health conditions for the Dushanbe population as a whole, but particularly its most vulnerable groups.

55. At the time of project preparation GOT was preparing a Poverty Reduction Strategy Paper (PRSP) which identified infrastructure deficiencies as a key factor hampering the development of

Tajikistan. Among the short-term policy measures identified in the PRSP were: (a) ensuring financial sustainability of the water companies; (b) developing an action plan for modernization, reconstruction and adequate maintenance of the infrastructure facilities; (c) liberalization of the services market in the sector; (d) improvement of the tariff policy to gradually achieve full cost recovery of the water services; (e) improvement of governance; (f) elimination of arrears; and (g) encouragement of know-how and technological transfers by operators.

56. The Project was also well aligned with the Millennium Development Goals (MDGs), particularly towards reducing by half the proportion of people without sustainable access to safe drinking water. In retrospect however, the PDO and associated result framework could have been more grounded in the reality of DVK's extremely degraded and low capacity water service, by giving more weight to basic goals of restoring safety and availability of water service. In a city affected by recurrent typhoid outbreaks and average service availability of less than 10 hours per day, the achievement of challenging operational performance goals such as demand management, energy efficiency and financial sustainability, could have prudently been listed as a secondary objective, or envisioned for a follow-up operation.

3.2 Achievement of Project Development Objectives

57. Despite some design weaknesses and many implementation disruptions, the Project has accomplished its main physical infrastructure outputs for both the original scope and the AF, albeit with uneven quality of results. The rehabilitations have contributed to greatly improved water quality and substantially improved reliability of the service in Dushanbe, although such results are not always fully captured by the PDO indicators. Importantly, due to the uneven performance and premature end of the SC, the Project did not achieve its operational and management objectives. In particular measured operational efficiency gains in terms of water loss reduction or energy efficiency were either insufficient or inconsistent. The financial viability of DVK was not improved. Such results are further discussed below.

58. The most significant and tangible contribution of the Project has been the improvement in distributed water quality, essentially through better coagulation, sedimentation and disinfection. This is captured by the relevant performance indicator, but is also universally recognized in Dushanbe and captured in customer surveys, through the elimination of recurrent turbidity events which in the past delivered "brown water" to customer taps. Parallel-financed investments financed by the IDB contributed to this outcome, although the eventual cancellation of IDB funding for the rehabilitation of SAM WTP filters left parts of the city supplied with unfiltered water. Overall, the Project is accompanied by a clear reduction in waterborne diseases: Typhoid cases decreased from 379 in 2002, to 177 in 2004, 22 in 2009 and 0 in 2010.

59. The availability and reliability of service was also substantially improved through selective rehabilitation of degraded network sections and renewal of 99 out of 101 booster pump stations serving apartment building blocks and other high areas previously affected by chronic shortages or lack of pressure. Such investments have definitely translated into service improvements, as almost universally recognized by governmental and non-governmental stakeholders. The completed rehabilitation of 60 booster stations under the AF in late 2010 has in particular reportedly led to a dramatic reduction of water shortages in apartment buildings during the summer of 2011. Such improvements remain however anecdotal, and are not formally captured and documented by the results framework, due to issues in the measurement of performance indicators. They furthermore do not strongly stand out customer surveys, the sample of which may be unfavorably biased, and the results of which are aggregated across the city, without separating the areas that benefitted most from reliability investments.

60. The operational efficiency and financial viability objectives of the Project were clearly not met. This is essentially due to the SC failure and to DVK's inability to implement, unassisted, any consistent

demand management and energy efficiency programs or to modernize its customer service systems and increase revenues for financial sustainability. To the contrary, some indicators show a degradation of performance, including for energy efficiency and cost-recovery. In addition to continued operational and management inefficiency, financial costs associated with interest repayment on on-lent IDA funds are also now contributing to DVK's growing income losses.

3.3 Efficiency

61. A Cost-Benefit Analysis (CBA) was done during project preparation resulting in an Economic Rate of Return (ERR) of 12.2% and a Net Present Value (NPV) of US$2.12 million. However, the appraisal document clearly indicated that much of the operational, technical and financial data required for this analysis was very limited or contradictory when different sources were compared. This lack of data made the CBA speculative to a large degree. The Project recommended a data collection system to be installed by the PO to provide the necessary information to allow better assessments of the economic benefits of the Project and better design of future operations. This data system was never implemented.

62. Even though several limitations were identified during appraisal, the Bank prepared a CBA to assess financial and economic viability, based on "with project" and "without project" scenarios. A sensitivity analysis was used to assess the influence of key variables on economic viability. The discount rate used was 10%, which is IDA's generally accepted used rate for water supply projects. The key assumptions for the Base Case model included the improvement performance targets, particularly lower energy costs, reduced water losses and increased operational efficiency...

63. Given the fact that the data collection system was never implemented, no ex-post CBA could be formulated. Furthermore, all the documentation related to the analysis could not be located and is not available in the PAD. Hence, it is unclear on the costs that were calculation, the investments that were included in the analysis, and the time horizon used for the CBA framework. The lack of reliable information was identified during appraisal and verified during the formulation of the ICR.

64. A CBA of a water supply project can be estimated if one of the following data is available: i) incidence of waterborne diseases with the direct costs (health treatment costs) and indirect costs (eg. lost wages), ii) data on production and consumption of individual consumers that would allow to estimate consumer surpluses from shifts in the demand curve for water supply. Alternatively, without access to secondary data, other methodologies such as Contingent Valuation, Contingent Choice and Ranking can be applied to gather the primary data to evaluate willingness to pay for improvements in water quality and reliability of water supply services. Lower energy costs (in this case these costs increased considerably) and increased operational efficiency may render cost avoided benefits but they are a limited aspect of a CBA framework.

3.4 Justification of Overall Outcome Rating

Rating: Moderately Unsatisfactory

65. The overall project outcome is rated Moderately Unsatisfactory. As described above, the Project achieved full implementation of most planned infrastructure outputs, a remarkable feat considering the many implementation challenges met, and a testimony to the commitment and effort of client and Bank teams. The original project objectives, to be measured by six agreed indicators, have however only been partially achieved despite mobilization of additional financing and a 1-year closing date extension. Progress was made in the safety and reliability of water supply service in Dushanbe, although at lower levels than expected (two indicators out of three have exceeded, or marginally reached, their target values, the remaining indicator was never measured). An alternative impact assessment by customer surveys

conducted in May 2011 before Project closing did not compensate for such indicator data gap. Finally, no significant result has been achieved by the components aimed at improving the operational efficiency and financial viability of DVK (none of the 3 performance indicators approached their target value).

66. The inconsistency of this overall rating with the last rating assigned by a supervision mission (Moderately Satisfactory) is explained as follows: Based on available indicator data and trends for two of the three service indicators (safety and pressure of service) and based on indirect or anecdotal evidence available for the third service indicator (continuity of service)[1], supervision missions assumed that the Project was on track to exceed the target values for arguably the three most important PDO indicators. In order to confirm and complement available indicator data, a customer satisfaction survey was planned for May 2011, just before Project closing. Such survey was expected to provide alternate data for the service indicators, and thus help make a stronger case for achievement of results. Unfortunately, the survey fell short of conclusively documenting a strong improvement in customer perception of service continuity (also see section 3.6 below).

3.5 Overarching Themes, Other Outcomes and Impacts

(a) Poverty Impacts, Gender Aspects, and Social Development

67. The final beneficiaries of the Project are the people of Dushanbe. Given the very high network connection rate, system improvements have benefited the great majority of the population including the poorer segments. However, given that at the time of appraisal the level of material poverty in Tajikistan was very high, with four out of five residents considering themselves 'poor', a third 'very poor', and nearly a fifth 'extremely poor', this project would benefit a large portion of the poor. Furthermore, the reduction of waterborne diseases benefits the most vulnerable (elders and children).

(b) Institutional Change/Strengthening

68. The Project has not resulted in significant positive impacts on longer-term capacity and institutional development. This is due to several reasons: i) The failed SC and the lack of a contingency plan for such event (it was expected that by the end of the SC, DVK would have acquired and sufficient capacity); ii) the weak capacity of the institutions to attract and keep highly qualified staff; and iii) due to the above, the PCU was forced to function more in isolation, and little integration of functions and institutional development was accomplished by Project closing date.

(c) Other Unintended Outcomes and Impacts (positive or negative)

69. Despite the fact that highly concessional IDA credits and grants were originally mobilized for the Project, the on-lending terms by GOT are resulting in unsustainable debt-service stress for DVK.

3.6 Summary of Findings of Beneficiary Survey and/or Stakeholder Workshops

70. A customer satisfaction survey was conducted in May 2011 prior to project closing, spanning a sample of 1,530 households and 70 commercial customers, the results of which are summarized in Annex 5. Due to its timing, the survey could not measure the full beneficial impact of the main contracts of the

[1] Such as in particular reduced number of service interruption claims, and anecdotal feedback by stakeholders such as users, DVK staff and NGOs.

AF phase, in particular the rehabilitation of 60 booster pump stations aimed at improving service in apartment buildings in the summer. The 1% household sample was for its part overrepresented customers living in the upper floors of apartment buildings and thus with unfavorable service conditions (48% of surveyed households lived on 4th floor or above).

71. Survey limitations notwithstanding, a key finding was that 96% of consumers have witnessed an improvement in water service over the last 2 or 3 years. About 76% of consumers are also now satisfied with water quality (color, taste, scent and limpidity). On the other hand, only 54% are satisfied with service pressure, and only 57% have continuous water service for more than 12 hours per day, a result directly affected by the above-mentioned sample bias.

72. With regards to tariffs, 81% of customers are satisfied with the current price of water. Despite service improvements, a majority of customers would refuse to pay more for water under the current service and fixed fee billing conditions, which are seen as "unfair". Most customers would welcome meters as a means to only pay for actual consumption.

4. Assessment of Risk to Development Outcome

Rating: Substantial

73. Almost all the financed infrastructure rehabilitations were completed, although with severe delays and uneven quality. The risk to Development Outcome is rated substantial due to: (a) the very low gains in institutional capacity building and technical knowledge transfer due to premature end of SC; (b) the worsened income losses and indebtedness since Project begun which can jeopardize the maintenance of assets and sustainability of investments, and (c) the lack of internalization and sustainability of M&E as a mechanism for DVK service improvement. Any subsequent phase must ensure to address these challenges in the very onset.

5. Assessment of Bank and Borrower Performance

5.1 Bank Performance

(a) Bank Performance in Ensuring Quality at Entry

Rating: Moderately Unsatisfactory

74. The Bank's performance in Project preparation is rated moderately unsatisfactory. While excellent sector and PPP expertise were mobilized for the preparation effort, project challenges and possibly investment needs, were underestimated. Led by two successive task team leaders (TTL), the preparation team developed a sophisticated design, based on relevant feasibility studies, and consistent with state-of-the-art PPP experience at the time. In retrospect however, considering the risks associated with the pioneering of a SC in a country with low institutional capacity, weak governance and no PPP experience whatsoever, project preparation should have sought to secure a deeper level of client ownership and included adequate risk mitigation and contingency plans, even at the cost of a longer preparation time. Furthermore, the Project adopted unrealistically short task execution periods, including a SC limited to 3 years.

75. During design it was clear that there was a serious lack of baseline information and the appraisal was formulated making significant simplifications and assumptions. The M&E approach was to rely fully on the PO, which may not have been the best strategy. The risk of termination or non renewal of the SC

was not properly factored in project design. As such, there was no strategy in place to deal with the partial failure and premature end of the SC. The fact that project design might have benefited had the Project team more cautiously considered client capacity and the prevailing country-level institutional conditions and processes does not diminish the concrete signs of relative project success, given that most of the infrastructure was laid despite uncommon contractual and institutional challenges.

(b) Quality of Supervision

Rating: Moderately Unsatisfactory

76. The quality of the Bank's supervision is rated moderately unsatisfactory. The existing documentation (ISRs) clearly demonstrates several highly relevant issues on procurement, financial sustainability, and the lack of PCU and DVK capacity, which all required close supervision of the Project. Despite highly committed individuals, Project supervision teams did not always include senior expertise commensurate with the technical, contractual, governance and customer-relation challenges of the Project. It was not until 2008 that the Bank acknowledged the need for increased supervision efforts and capacity. Furthermore, even though the initial team was very experienced and had good knowledge of the design assumptions, the Project subsequently had several TTLs with diverse seniorities and experiences, who managed the Project for relatively short periods of time. Turnover of TTLs was high, with six TTLs in nine years of implementation.

77. This project was designed with limited information and in a country with limited experience in working with the Bank and with weak institutional capacities. From the onset the Bank should have foreseen the need to allocate commensurate staff and budget resources to ensure more effective implementation support. TTL assignments should have been managed to ensure less frequent rotations and discontinuities.

78. Infrastructure investments have continued although several highly relevant studies, plans and programs were needed to assess the effectiveness of the investments. For example, the water quality monitoring program was never established but improvements in quality are part of the objectives of the program. Also, the PO was responsible for the implementation of the leak detection program, and this has not been implemented. A hydraulic model was not completed, a cadastre of users is not available, zoning has not been implemented, and the financial management system is not in use. All of these activities were identified at the onset of implementation and represent critical aspects for the successful design and planning of infrastructure investments and operations. The Bank had to ensure that these activities were prepared and executed before continuing with large investments, including the additional financing.

79. In terms of fiduciary policies the team emphasized compliance, raised issues and achieved gains on the procurement, environmental management, financial sustainability and financial management fronts. On the broader governance and institutional agenda however, supervision teams lacked leverage and traction to bring about reforms that could promote increased operating autonomy of DVK or effective delegation of management responsibilities to PO. On the one hand, supervision resources were predominantly consumed with numerous short-term implementation issues. On the other hand Bank-driven policy dialogue on DVK governance reform experienced stagnation, in part due to insistence on DVK corporatization models in the face of firm municipal rejection and long readiness odds.

80. The failure to extend the SC in February 2006 and the absence of alternative would have required very close supervision from the Bank to ensure an adequate transition. At this critical stage, where radically changed implementation arrangement become inconsistent with the Project performance objectives, a restructuring of the Project may have been justified, along with the contracting of substantial additional support to the PCU and DVK for assistance in the transition of responsibilities. The Bank did

not increase its support or supervision, leaving DVK and PCU with limited capacity, knowledge and oversight for their increased duties.

81. **(c) Justification of Rating for Overall Bank Performance**

Rating: Moderately Unsatisfactory

82. The Bank shares in the responsibility for the overly ambitious design, the aggressive on-lending terms and for the uneven strength of supervision. Despite strenuous efforts of supervision teams, the Project struggled from the start. Some hurdles lay beyond the design and scope of the Project, but others warranted mitigation by the Bank during implementation stages. In retrospect, because it was within Bank's control to design a less risky and aggressive project approach, to ensure more consistent M&E and supervision capacity and less TTL rotations, to ensure a stronger and clearer working relationship with the Municipality, and to restructure the Project in a timely manner, the overall Bank performance is rated moderately unsatisfactory.

5.2 Borrower Performance

(a) Government Performance

Rating: Moderately Unsatisfactory

83. GOT's performance is rated moderately unsatisfactory. Although the Government supported the Project concept, it did not consistently sustain its implementation against an increasingly defensive Municipality, and should have responded to problems more proactively. Delays in counterpart co-financing disbursements were experienced, although much reduced, through Project closing. Tariff revisions and adjustments were not made according to what had been agreed. GOT's on-lending to DVK has clearly diminished the PO's capacity to improve its financial capacity. DVK has been incurring increasing income losses throughout project implementation, partly due to the debt service to GOT.

(b) Implementing Agency or Agencies Performance

Rating: Moderately Unsatisfactory

84. The Implementing Agencies' performance is rated moderately unsatisfactory. The biggest issue faced by the implementing agency was the requisite capacity, or lack thereof, to implement the Project in response to the PDO. The Project design intended a PPP to fill any capacity gap needs while phasing out capacity transference during the Project. The relationship between DVK and the private operator was technically productive (operator was still able to accomplish many activities), but contractually problematic because of the strained operating context, mixed operator's performance, and reportedly weak DVK commitment to salvage the service contract. The lack of cooperation from DVK to provide the necessary information to the PO and to transfer the management of its operations, as stipulated in the service contract, caused major implementation delays. Beyond GOT's commitment to institutional reforms, DVK's limited ownership of the Project's institutional goals and of the PPP approach significantly impaired implementation.

85. Throughout implementation it was stressed that one of the major causes for delays during implementation was the inability of DVK to strengthen its capacity for the proper supervision of contracts. The implementing agency nevertheless deserve full credit for completing the infrastructure component,

despite the departure of the private operator, including through an impressive acceleration of works achieved in the last six months.

(c) Justification of Rating for Overall Borrower Performance

Rating: Moderately Unsatisfactory

86. The Project has several years of delays primarily during the implementation of the works. The GOT's lack of willingness to raise tariffs and to reevaluate the on-lending terms of the loan to DVK were not actions in support to the effective implementation of the Project and the accomplishment if its PDO. DVK's inability to provide the PO with the required information which caused delays in the service contract and later on the failure of the approach, and the lack of substantial efforts to strengthen capacity during implementation to effectively supervise the contracts, are more an illustration of weak ownership than on full support to accomplish the loan's PDO. Based on the GOT's and implementing agencies' performance, overall Borrower's performance is rated **moderately unsatisfactory.**

6. Lessons Learned

87. Several lessons are to be learned from the Project, and may apply to the preparation and implementation of future projects with similar ambition in low capacity contexts:

88. ***Pick your battles: Balancing infrastructure rehabilitation and service improvement emergencies with operating performance and institutional reform expectations.*** Ambitious operations like DWSP, pursuing accelerated infrastructure rehabilitation and service improvements in low capacity and poor governance environments, may also pursue operational efficiency gains and seek to advance a reform agenda. They must however set relative priorities for such wide ranging objectives. Project design should in particular be prepared to attach greater value to urgent basic infrastructure objectives clearly embraced by clients (such as completion of rehabilitation works, improved safety of water supply, improved reliability of water supply), while setting realistic expectations for utility performance and institutional reform gains. Such pragmatic goal-setting, and its corresponding results framework, would not preclude proactive pursuit of performance and institutional goals throughout implementation. Follow-up operations should fund systematic metering programs, to synergistically promote demand management, increased revenue, improved service and efficiency goals.

89. ***Supervision, supervision, supervision: Need to tailor resources to implementation challenges***. Beyond ambitious objectives, the Project pioneered sophisticated implementation arrangements (such as a PPP and the Bank's fiduciary procedures) in Tajikistan's low capacity water sector, with complex transactions requiring new skills and changed behaviors. Given the clear risks, Project supervision budgets and staffing should be tailored to allow frequent missions of relevantly senior experts, to consolidate stakeholder understanding and ownership of Project approaches, ensure early identification of problems and provide responsive and authoritative guidance.

90. ***Hope for the best, plan for the worse: Contingency planning against disruption of implementation arrangements.*** In low capacity, low transparency contexts such as Dushanbe, Project design should anticipate potential disruptions or dysfunctions of planned implementation arrangements, such as PPPs, with relevant back-up measures to maintain adequate technical and operational leadership and control over the Project. A typical back-up measure could be the switch from PPP to a less ambitious technical assistance approach. Legal agreements should include clear incentives for Borrower and Implementing Entity to maintain competent and independent Project implementation capacity.

91. ***Be proactive. Don't wait to restructure projects with compromised outlook.*** The Project should have been restructured, with relevant updates to the implementation arrangements and the results framework, in the aftermath of non-renewal of the SC in early 2006.

92. ***A bird in the hand is worth two in the bush: Risk mitigation through conservative goal-setting and robust results framework.*** The DWSP experience confirms that water supply and sanitation operations with substantial investment in low capacity countries can take 8 to 10 years to implement successfully. From the onset, preparation of such projects can mitigate implementation risks by moderating the ambition of performance targets, allowing for extended implementation periods to accommodate delays, and designing robust result frameworks that will capture results. Such result framework should be adapted to local measurement capacities, and recognize the value of simply installing quality infrastructure. The design of the results framework should be completed at appraisal.

93. ***Keep it simple. Mitigating the impact of on-lending interest mark-ups.*** The practice of encouraging or enabling a Borrower to act as a financial intermediary, and to substantially modify the terms of IDA credits and grants on-lent to a beneficiary implementing agency should be carefully assessed in future operations. Although onlending terms are primarily a sovereign issue, financial gains on IDA fund onlending deserve strong justification. Financing agreements may furthermore specify if and how such revenues should be monitored, and what sector uses they should apply to.

7. Comments on Issues Raised by Borrower/Implementing Agencies/Partners

(a) Borrower/implementing agencies

94. A thorough Borrower ICR is provided in Annex 7a, with a balanced review of Project results and a candid assessment of Project preparation and implementation issues, which to stress perceived weaknesses in the original Project design.

95. Client comments on the final draft ICR are also presented in Annex 7b. In synthesis, the Client objects to the *Moderately Unsatisfactory* overall outcome rating proposed for the Project. The case is made that *Moderately Satisfactory* would more objectively and fairly rate the success of the Project, considering the top priority to be attached to improving quality and safety of water supply, and given the design limitations at entry which affected implementation and results monitoring (e.g. excessively short SC duration, insufficient budgets, unmeasurable indicators,…).

(b) Cofinanciers

None

(c) Other partners and stakeholders

None

Annex 1. Project Costs d Financing

(a) Project Cost by Component (in USD Million equivalent) - Credit 3664-TJ

Components	Appraisal Estimate	Actual/Latest Estimate	% of Appraisal
1. Repair and rehabilitation fund	12.17	18.17	149.3%
2. Service Contract	5.19	2.26	43.6%
3. Consulting services to PCU	0.18	0.82	455%
4. Project Coordination Unit	0.30	0.45	150%
5. Refinancing of PPF	0.40	0.00	
Total Baseline Cost	18.24	21.70	
Physical Contingencies	0.00	0.00	
Price Contingencies	1.19	0.00	0%
Total Project Costs	19.43	21.70	111.68%
Total Financing Required	19.43	21.70	

(b) Financing

Source of Funds	Type of Cofinancing	Appraisal Estimate (USD m)	Actual/Latest Estimate (USD m)	Percentage of Appraisal
Borrower		2.43	1.79	73.7%
International Development Association (IDA)		17.00	19.91	117.1%

(b) Project Cost by Component (in USD Million equivalent) - Credit 3664-1-TJ / Grant H264-TJ

Component & Categories	Appraisal Estimate	Actual/Latest Estimate	% of Appraisal
1. Provision and installation of sodium hypo-chlorine equipment	1.50	2.00	133.3 %
2. Rehabilitation of rapid sand filters at the Napornaya WTP	1.20	1.58	131.7 %
3. Additional equipment, rehabilitation of booster stations:	2.00	0.82	41 %
4. Technical assistance to DVK	0.80	0.85	106.3 %
5. Project management, including financing of operating costs	0.20	0.48	240 %
Total	5.70	5.75	
Total (including pending payments from counterpart financing)[2]		5.87	102.9 %

[2] Includes US$105,000 for audit contract.

Annex 2. Outputs by Component

The Project consisted of five components:

1. *Component 1: Repair and Rehabilitation Fund.* This component would support essential short-term expenditures (such as operational equipment, vehicles, computer hardware and software) and a least-cost capital investment program aimed at improving the operations of the water supply system, reducing the water losses, improving the network operations, implementing a metering program, improving the quality and safety of water, and achieving the performance improvement targets in the service contract. The PO, together with DVK staff, would propose the investments that were required to optimally re-structure and rehabilitate key components of the systems, implement a demand management program, and set up financial management, accounting and commercial systems. A set of urgent investments (the Immediate Investment Program) was identified, costed and designed by DVK and its consultants during project preparation for consideration and use in the first year of the Service Contract, as a tool to accelerate project implementation.

2. Under this component the Project effectively implemented the following:
   - 40 km of pipeline renewal;
   - Incomplete establishment of 19 pressure zones. As part of this unfinished activity, 124 valves and rotary valves (100-900mm diameter) and pressure gages were installed at nodal points in the network.
   - Development of a Network Information System (NIS). Geographic information system software was installed and DVK staff was trained for its use. Network maps were scanned, pipes were vectorized, but facility data were not introduced. NIS is currently not operational.
   - Installation of production meters: Ultrasonic meters were procured and installed at SAM, NAP, KAF and SWW. Equipment was never commissioned, because NAP and KAF installations failed to work (allegedly due to radio-frequency interferences). Following contractor failure to correct situation, equipment was mothballed, and is not in use.
   - 2,500 retail water meters were procured, of which 800 were installed under the Project in the clean water zone. DVK has since reportedly completed their installation on its own funds.
   - Cleaning and restoration of the two daily sedimentation ponds at the SAM WTP, by removal of 200,000 m^3 of accumulated sediments. IDB financed a subsequent rehabilitation step for lining of the ponds.
   - Cleaning and restoration of six sedimentation ponds at NAP WTP, with renewal of physico-chemical treatment equipment.
   - Rehabilitation of pumps and electrical equipment for the 1st and 2nd lifts at KAF, SWW, and SAM. Pumping and electrical equipment was procured for NAP, but could not be installed due to insufficient funds for required civil works reconstruction of pump station and reservoirs.
   - Rehabilitation of 39 (out of 101) DVK booster pump stations, with renewal of pumps and electrical equipment.
   - Procurement, on an emergency and temporary basis, of maintenance, transportation and communications equipment, uniforms and special work clothing, computer hardware and software, as well as consumables such as fuel, chlorine, coagulant, spare parts for equipment, etc.

3. *Component 2: Service Contract.* This component would finance the costs related to the service contract. These costs included a base fee and a performance-based fee to be paid to the Private Operator (PO) based on achievement of targets defined in the Performance Standards Appendix of the contract. The PO would be given full responsibility for managing DVK personnel in the water supply and financial areas, defining and implementing the demand management program and the commercial (billing and collection) and financial management systems. More specifically, this component:

a. Paid for: (i) the salaries and expenses of the PO core group of management staff with international experience in water supply sector who will implement the SC; and (ii) provided funds for a performance-dependent bonus paid to the PO for achievement of specific targets defined in the SC. This bonus was to provide incentives necessary to ensure measurable improvements in reduction of water losses, increase of collections and increase of water safety among other factors specifically defined in the SC. The actual amount of the incentive fee to be paid to the PO was to be determined by the application of a performance factor to the maximum annual incentive fee.
b. Required the PO to provide staff with expertise in (i) general management of water supply utilities, ii) financial accounting and management, cost accounting and budgeting, iii) water supply, mechanical, electrical and environmental engineering; iv) public information and community relations,, v) maintenance, repair, material and inventory management.
c. Required the PO to provide the following services:
    - Operate the facilities to carry out pumping and transport of water from water sources, treatment and disinfection of water, and distribution and supply of potable water to consumers;
    - Maintain the facilities to an improved standard of maintenance within the resources available and develop a maintenance management program for the facilities;
    - Carry out the rehabilitation and repair of the facilities according to procedures of, and using funds from, the Repair and Rehabilitation Fund so as to achieve the performance improvement targets of the system;
    - Carry out all billing, collection and customer service functions related to the new and existing customers in the service area, and install and manage a computerized commercial system;
    - Install and manage financial management and accounting systems;
    - Develop and implement programs for (i0 water quality monitoring, (ii) facility safety deficiencies correction; (iii) inventory management; (iv) operating & maintenance procedures; (v) energy management; (vi) staff training and development; (vii) commercial management; and (viii) preparation of quarterly, semi-annual and annual reports as specified in the SC, as well financial and implementation progress reports using formats acceptable to the Bank.

The SC was effectively in place between January 2003 and February 2006. For detailed account of the challenged history and outputs of this component, the reader is referred to the candid and balanced account provided by PCU in Annex 7.

4. *Component 3: Consulting Services to the Project Coordination Unit*. This component would finance consulting services to support the PCU in its supervision of the PO's performance and compliance with the terms of the Service Contract. This component was implemented.

5. *Component 4: Project Coordination Unit.* This component financed the incremental operating expenditures incurred by the PCU on account of management of Project implementation for communications, utilities, printing and publications, office rent, maintenance and supplies, office security systems, vehicle operation and maintenance, transportation and field trip expenses, training of PCU staff for purposes of Project management, remuneration for staff, including qualified social charges but excluding salaries of civil servants. This component was fully implemented. In fact, with the non renewal of the SC, PCU consultants de facto substituted the PO for implementation tasks.

6. *Component 5: Refinancing of Project Preparation Facility (PPF):* This component would refund the PPF advance used for PCU establishment, final designs and bidding documents of the Immediate Investment Program, implementation of the financial management system, procurement assistance, and training. The component was executed.

The Additional Financing also funded five components, with the following outputs:

7. *AF Component 1: Disinfection Equipment Component:* Installation of hypo-chlorination equipment for water disinfection at SAM WTP. The equipment was successfully installed, and is fully operational. The on-site generation of sodium hypo-chlorite is considered a more reliable and less hazardous water disinfection process, compared with the standard alternative of gaseous chlorination. Given the cancelled renewal of SAM WTP filters in the previous investment phase, chlorination is currently inefficiently applied to coagulated, sedimented unfiltered water. This will be corrected with the partial rehabilitation of SAM filtration capacity now planned under the follow-up investment phase (2nd Dushanbe Water Supply Project)

8. *AF Component 2: Civil Works and Capital Repair Component:* Renewal of rapid sand filters at the Napornaya Water Treatment Plant. The original sand filters dated back to 1939 and had not been working since 1991. Despite implementation quality and delay concerns, the rehabilitated filters are fully operational. Rehabilitation of the NAP WTP will be completed under the follow-up investment phase (2nd Dushanbe Water Supply Project), with renewal of the NAP pumping station and reservoirs.

9. *AF Component 3: System Rehabilitation, Booster Stations:* Rehabilitation of 60 booster pump stations, serving about 80,000 consumers, towards reducing erratic water supply in particular during summer in high rise apartments. This component was fully completed and is in operation.

10. *AF Component 4: Provision of Technical Assistance to DVK:* Consultants were hired to support the upgrading of financial management and accounting systems, and to conduct annual audits. Planned consultancies to complete network zoning and conduct leak detection were only partially implemented due to insufficient funds.

11. *AF Component 5: Assistance with Project Management:* This component, consisting of operating costs for the operation of the PCU, was fully implemented.

Annex 3. Economic and Financial Analysis

Economic Analysis

1. A Cost-Benefit Analysis (CBA) was done during project preparation resulting in an Economic Rate of Return (ERR) of 12.2% and a NPV of US$2.12 million. However, the appraisal document clearly indicated that much of the operational, technical and financial data required for this analysis was very limited or contradictory when different sources were compared. This lack of data made the CBA speculative to a large degree. The Project recommended a data collection system to be installed by the PO to provide the necessary information to allow better assessments of the economic benefits of the Project and better design of future operations. This data system was never implemented.

2. Even though several limitations were identified during appraisal, the Bank prepared a CBA to assess the financial and economic viability, based on with and without project scenarios. A sensitivity analysis was used to assess the influence of key variables on the economic viability of the Project. The discount rate used was 10%, which is IDA's generally accepted used hurdle rate for water supply projects. The key assumptions for the Base Case model included the improvement performance targets, particularly in lower energy costs and increased operational efficiency that would result in reduction of water losses.

3. Given the fact that the data collection system was never implemented, the ex-post CBA could not be formulated. Furthermore, all the documentation related to the analysis could not be located and is not available in the PAD. Hence, it is unclear on the costs that were calculation, the investments that were included in the analysis, and the time horizon used for the CBA framework. The lack of reliable information was identified during appraisal and verified during the formulation of the ICR.

4. A CBA of a water supply project can be estimated if one of the following data is available: i) incidence of waterborne diseases with the direct costs (health treatment costs) and indirect costs (eg. lost wages), ii) data on production and consumption of individual consumers that would allow to estimate consumer surpluses from shifts in the demand curve for water supply. Alternatively, without access to secondary data, other methodologies such as Contingent Valuation, Contingent Choice and Ranking can be applied to gather the primary data to evaluate willingness to pay for improvements in water quality and reliability of water supply services. Lower energy costs (in this case these costs increased considerably) and increased operational efficiency may render cost avoided benefits but they are a limited aspect of a CBA framework.

Financial Efficiency

5. Given the inconsistencies detected in the financial model used at appraisal to calculate project investment rate of returns (IRR), such IRR analysis was not replicated as part of the ICR effort. A financial analysis is instead presented based on utility data to assess the efficiency of the investments.

6. Progress towards financial viability of DVK was at the core of sector issues addressed by the Project at appraisal. Aside from considerable technical problems, the main obstacle identified in the PAD was to set up the financial and institutional framework that would eventually allow DVK, over a long-term horizon, to operate as both technically and financially sound local utility. Increasing DVK's tariffs and revenue collection was the most critical challenge at the time. The main problems facing DVK in the area of finance included: (i) tariffs that were below operating and maintenance costs (and no adequate provision for asset renewal); (ii) low collection of service charges which resulted in ever increasing accounts payable and receivables; (iii) minimal cash collections particularly from the budget organizations and industrial consumers; (iv) a highly distorted tariff structure with commercial tariffs about 8-10 times higher than those for domestic consumers; (v) inadequate short and medium-

term operating and capital planning; (vi) debt service increasing due to on-lending in US dollars to DVK; and (vii) insufficient and outdated information about customers that directly affects billing.

7. The Project's strategic choice was to strengthen DVK's financial capacity through improved financial management and commercial practices. A financial recovery plan was prepared by DVK during project preparation with two main objectives: (i) to achieve at the end of the Project a basic level of financial sustainability where DVK can collect sufficient revenues to cover its operations, basic maintenance of the water supply system, and debt service; and (ii) to make counterpart contributions to the Project (this financial capacity will be maintained after the Project in order to use this revenue collection to continue the enhanced maintenance and repairs of the system).

8. The financial recovery strategy was based on the following strategic actions:
   - Aggressive reduction of system inefficiencies (water losses, energy inefficiency, low cash collection, and water wastage) to reduce costs of operations;
   - Implementation of a commercial strategy aimed at eliminating unregistered connections and users, and building trust in the community through better water supply and customer service;
   - A strategic and cost-effective metering policy linked with an effective customer relations plan aimed at increasing revenues and/or reducing wastage;
   - Set up of financial management, accounting, and commercial systems and procedures that will provide better information about costs;, revenues, and customers, and allow DVK to make better policy and tariff recommendations to the Government and implement effective commercial actions;
   - Gradual reduction of cross-subsidies combined with enforcement of the disconnection policy to reduce fiscal pressure, increase revenue collection from Government organizations and industry, and free up resources to design and implement a targeted subsidy policy to the truly poor once better information on the customer base is available;
   - Gradual reduction of non-cash forms of payment (barter and off-sets). As DVK is just one link in the existing chain of clearance payments, it will be impossible to do an immediate shift to payments exclusively in cash. The cash collection increase will focus first on the domestic and commercial sector, and gradually move to the industrial and government sector;
   - Collection of better information on the fixed assets and current operational situation of the water supply system as a first step to have a clear assessment of the maintenance and rehabilitation needs and to make informed recommendations in the tariff reviews during project implementation;
   - Linkage of the financial recovery strategy with the service appendix in the service contract between the Municipality, DVK and the international utility operator to ensure adequate attention to the urgency of DVK's financial improvement needs; and
   - Close supervision of progress and effectiveness of the financial recovery plan, and flexibility to adapt to changing conditions within the framework of the service contract.

Analysis

9. The original financial analysis was not available so it could not be fully replicated so an assessment of DVK is based on current financial statements.

10. The financial standing of DVK did not improve during the implementation of the Project. Even though billing collection has increased considerably (from 22% in 2002 to 95% in 2009), the low tariff levels and increasing costs in DVK have resulted in income losses in every single financial year during project implementation. In nominal terms, income losses during the life of the Project have almost tripled. This situation will be exacerbated with the need to increase capital expansion and

operation and maintenance of existing and new works unless new efforts are devised to demand management and to ensure an adequate tariff policy.

11. Tariffs were increased on several occasions but these increases were well below of the required levels. In most cases, particularly since 2008, tariff increases primarily reflected the large increases in energy costs. In real terms, taking into account inflation, these increases were minimal. Therefore, DVK registered net operating losses as its tariff revenues were not sufficient to keep up with inflation and cover operating costs, making the company progressively more dependent on financial support from the Municipality or on deferred payment suppliers and services.

Conclusions and recommendations

- The financial performance of the DVK calls for substantial improvements and efficiencies to be achieved. The Project fell short of its targets.
- With the current tariffs and collection rates levels, DVK is not able to generate sufficient cash to cover its operating expenses and annual debt service.
- Increases in tariff levels should be contemplated in real, rather than nominal terms,
- Financial, technical and commercial efficiency activities should be mainstreamed into project design and carefully monitored during project implementation,
- Water metering is essential for improving financial efficiencies and such programs should be implemented early on, not at the near end of the Project,
- Basic assumptions such as exchange rates and inflation should be carefully embedded in financial simulators. Future modeling exercises should include a risk analysis section to identify sensitive variables that have a stronger influence on the outcome of the results.

Title	Unit	2006	2007	2008	2009	2010
Water production and sold water						
Water production	000 m3	276726	246556	238376	246754	**249822**
Water loss (technical and non-technical)	000 m3	201346	170721	176162	188497	193645
Volume of sold water (billed)	**000 m3**	**75380**	**75835**	**62214**	**58257**	**56177**
Population	000 m3	42850	39511	33992	35587	37388
Commercial/Industrial	000 m3	4801	3895	4048	3643	3764
Budgetary organizations	000 m3	19768	17579	16437	14808	13485
Other customers		7961	14850	7738	4219	1540
Approved water tariff rates -see Note 1 below						
Population	Thousand m^3	0,025	0,042	0,1	0,118	0,139
Commercial/Industrial	Thousand m^3	0,279	0,45	0,75	0,85	0,92
Budgetary organizations	Thousand m^3	0,087	0,14	0,3	0,35	0,413
Other customers	Thousand m^3	0,279	0,45	0,75	0,85	0,92
Realized water tariffs - see Note 2 below						
Population	Thousand m^3	0,041	0,060	0,117	0,159	0,201
Commercial/Industrial	Thousand m^3	0,630	1,046	1,461	2,016	1,798
Budgetary organizations	Thousand m^3	0,159	0,236	0,441	0,599	0,689
Other customers	Thousand m^3					
Average realized water tariff	**Thousand m^3**	**0,105**	**0,139**	**0,275**	**0,376**	**0,419**

Billed water revenues (including VAT)						
Population	Thousand TJS	1775	2363	3974	5660	7510
Commercial/Industrial	Thousand TJS	3023	4075	5916	7345	6766
Budgetary organizations	Thousand TJS	3147	4147	7244	8877	9287
Total billed revenues (including VAT)	Thousand TJS	**7945**	**10585**	**17134**	**21882**	**23563**
Total billed revenues (excluding VAT)	Thousand TJS	**6621**	**8821**	**14278**	**18235**	**19969**
Collected water revenues (including VAT)						
Population	Thousand TJS	1559	1953	2642	4990	7646
Commercial/Industrial	Thousand TJS	2024	2786	4907	7304	6454
Budgetary organizations	Thousand TJS	3036	3790	5873	8770	10445
Total collected revenues (including VAT)	Thousand TJS	**6619**	**8529**	**13422**	**21064**	**24545**
Total collected revenues (excluding VAT)	Thousand TJS	**5516**	**7108**	**11185**	**17553**	**20801**
	Thousand TJS					
Collection ratio (5)						
Population	%	88	83	66	88	102
Commercial/Industrial	%	67	68	83	99	95
Budgetary organizations	%	96	91	81	99	112
All consumers	**%**	**83**	**81**	**78**	**96**	**104**
Operating expenses						
Salaries & wages	TC/m3	1797	2022	3320	4048	4323
Social fund contributions	TC/m3	449	506	830	1012	1081
Materials and Spare parts	TC/m3	1362	1210	2556	2236	2140
Electrical energy	TC/m3	1479	1665	3723	4322	3994
Fuel	TC/m3	490	982	1890	1175	1221
Taxes & compulsory contributions	TC/m3	89	368	741	1338	1528
Administrative expenses	TC/m3	2666	2011	2654	1843	957
Other cash operating expenses	TC/m3	2318	3142	3600	3339	2248
Total operating expenses	**TC/m3**	**10650**	**11906**	**19314**	**19313**	**17492**
Depreciation	TC/m3	2772	4717	4792	5102	9818
Total operating expenses	**TC/m3**	**13422**	**16623**	**24106**	**24415**	**27310**
Interest expense & financial charges	TC/m3	4506	1233	860	20094	2576
Total expenses	**TC/m3**	**17928**	**17856**	**24966**	**44509**	**29886**
Annual working ratio - see Note 3 below	**ratio**	**1,61**	**1,4**	**1,43**	**0,92**	**0,71**
Current assets and liabilities						
Accounts receivable from residential customers	TC/m3					

Accounts receivable from budgetary customers	TC/m3					
Accounts receivable from other customers	TC/m3					
Total accounts receivable	**TJS 000**	**2527**	**2408**	**4349**	**4438**	**4300**
Other current liabilities	TC/m3	10898	9573	5539	9331	8295
Total current assets	**TC/m3**	**13425**	**11981**	**9888**	**13769**	**12595**
Trade accounts payable	TC/m3	6435	5324	9019	9749	9319
Other accounts payable	TC/m3	2872	5177	6134	7253	5378
Other current liabilities	TC/m3					
Total current liabilities	**TC/m3**	**9307**	**10501**	**15153**	**17002**	**14697**
Current ratio (current assets/current liabilities)	**ratio**	**1,44**	**1,14**	**0,65**	**0,81**	**0,86**
DVK's share of annual debt service - see Note 4 below						
Interest & financial charges						
Loan principal repayment	TC/m3		1233	860	1460	2576
Total annual debt service	TC/m3		25	422	761	1182
Current ratio (current assets/current liabilities)	**TC/m3**		**1258**	**1282**	**2221**	**3758**

Notes:

1. Approved tariffs are the tariff levels approved by the municipal/regional authorities.
2. Realized tariffs are the tariff levels actually realized by DVK; they are calculated as annual billed revenues divided by annual billed volume.
3. Annual working ratio is annual cash operating expenses divided by annual collected revenues (including VAT).
4. DVK's share of debt service is the share that DVK is actually expected to pay; the share of debt service to be paid by the Government should be excluded.

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Annex 4. Bank Lending and Implementation Support/Supervision Processes

(a) Task Team members

Names	Title	Unit	Responsibility/ Specialty
Lending			
Ede Jorge Ijjasz-Vasquez	Sector Director	LCSSD	TTL
Motoo Konishi	Country Director	ECCU8	Sector Manager
Walter Stottman			Former Sector Mgr
Felix Jakob	Consultant	ECSS6	Former TTL
Maniza Naqvi	Sr. Social Protect Specialist	AFTSP	Social Dev. Spec.
Rinat Iskhakov	Operations Officer		Operations Analyst
Takao Ikegami	Sr. Sanitary Engineer	EASIN	Procurement
Matin Kholmatov	Consultant	ECSPE	
Hiran Herat	Consultant	SASDI	FM
Christophe Bosch	Sector Leader	AFTUW	Economics
Rajesh Sinha	Principle Investment Officer	CN1S5	Financial Analysis
Nirmala Saraswati	Consultant		Environment
Piotr Krzyzanowski	Consultant		Environment
Junko Funahashi	Sr. Counsel	LEGEN	Legal
Ahmed Jehani		LEGEN	Legal
Hannah Koilpillai	Sr Loan Officer		Disbursement
Tamara Noel			Program Assistant
Supervision/ICR			
Sana Kh.H. Agha Al Nimer	Sr Water & Sanitation Spec.	MNSWA	Engineer
Takao Ikegami	Sr. Sanitary Engineer	EASIN	TTL
Pier Francesco Mantovani	Lead Water and Sanitation Spec.	ECSS6	TTL
Jonathan S. Kamkwalala	Sector Manager	AFTWR	TTL
Yarissa Lyngdoh Sommer	Operations Analyst	ECSS6	Operations analyst
Sanyu Sarah Senkatula Lutalo	Sr. Water and Sanitation Spec.	ECSS6	Engineer
Gailius J. Draugelis	Sr. Energy Spec.	EASCS	
Jan Drozdz	Sr. Water and Sanitation Spec.	AFTUW	TTL
Naushad A. Khan	Consultant	SARPS	
Norpulat Daniyarov	Sr. FM Spec.	ECSO3	Financial mgt.
Mirlan Aldayarov	Energy Specialist	ECSS2	
Roxanne Hakim	Sr. Anthropologist	ECSS4	Safeguards
Salim Benouniche	Lead Procurement Spec.	MNAPR	Procurement
Van Anh Vu Hong	Young Professional	ECSS6	Data analysis
Bogdan Constantinescu	Sr. FM Spec.	ECSO3	Financial mgt.
Loup J. Brefort	Country Manager	ECCYU	
Youling Zhou	Lead Procurement Spec.	EAPPR	Procurement
Christophe Bosch	Sector Leader	AFTUW	TTL
Anna Cestari	Water Resources Spec.	ECSS6	Co-TTL

Ruxandra Maria Floroiu	Environmental Engr.	ECSS3	Safeguards
Rinat Iskhakov	Operations Officer	ECSS6	Operations
Serdar Jepbarov	Operations Officer	ECCTM	Operations, co-TTL
Aziza Nazirova	Program Assistant	ECCTJ	
Milane Reyes De Jesus	Program Assistant	ECSSD	
Dilshod Karimova	Procurement Analyst	ECSO2	Procurement
Sodyk Khaitov	Consultant	ECAVP	
Takhmina Mukhamedova	Operations Analyst	ECCTJ	Operations
Kishore Nadkarni	Consultant	ECSS2	Financial analysis
Shodi Nazarov	Financial Management Analyst	ECSO3	Financial m
Fasliddin Rakhimov	Procurement Specialist	ECSO2	Procurement
Klas B. Ringskog	Consultant	EASIN	Institutional reform
Diego Juan Rodriguez	Senior Economist	ETWWA	ICR development
Leila Talipova	Consultant	ECSSD	Engineer
Alexandru Ursul	Consultant	ECSSD	Engineer

(b) Staff Time and Cost

Stage of Project Cycle	Staff Time and Cost (Bank Budget Only)	
	No. of staff weeks	USD Thousands (including travel and consultant costs)
Lending		
FY99		66.80
FY00	19	93.54
FY01	34	92.18
FY02	30	86.01
FY03		-1.08
Total:	83	337.45
Supervision/ICR		
FY02	1	5.51
FY03	40	171.53
FY04	37	135.72
FY05	39	101.24
FY06	30	94.37
FY07	34	61.50
FY08	29	60.45
FY09	37	149.5
FY10	32	99.1
Total:	309	963.72

Annex 5. Beneficiary survey results

1. Project preparation benefitted from a *Social Assessment Study* carried out in 1999, with a civil society workshop in 2000[3], to assess users' perception of the quality of the water and sewerage system in Dushanbe, and their willingness to contribute to the improvement of water supply services. No systematic further customer surveys were conducted during project implementation, with the exception of a final customer satisfaction survey at project closing, aimed at complementing the evaluation of the Project beyond the limitations of the results framework.

2. Such *Social Impact Assessment of the Project and Consumer Satisfaction* (SIAPCS) was conducted in the spring of 2011 (final report June 2011) to monitor and evaluate client perceptions as to impacts of the Project (final report dated June 2011). Because of its timing, the survey could not capture all project impacts.

3. To that effect DVK hired consultants to assess, on the customers' side: (i) the coverage and reliability of water utilities, (ii) the quality of treated drinking water, (iii) the availability and effectiveness of service, (iv) the ability to effectively meet the needs of vulnerable subgroups, (v) the degree of consumers satisfaction with service, and (vi) the degree of rational use of drinking water.

4. Surveys were conducted by 13 local interviewers, trained in survey and data analysis techniques. 1,530 households and 70 commercial clients enterprises were interviewed, sampled from within Dushanbe city, Somony district, Firdawsi district, Shomansur district and Sino district. The household sample was heavily skewed towards overrepresentation of customers living in upper floors of apartment buildings (48% of surveyed households live on 4th floor or above). Although the survey was designed to assess desegregated project impacts in the four main service areas of DVK, i.e. SAM (Samotechnaya WTP), NAP (Napornaya WTP), SWW (South-West Wellfield Intake) and KAF (Kafarnigan Wellfield Intake), survey results were only made available in aggregate for Dushanbe as a whole. The survey intervened before completion of the critical NAP filters rehabilitation. The survey also intervened before summer, the most critical season for service pressure and continuity. Accordingly the surveyed households had not yet experienced the improvement in summer service brought about by the 60 booster pump station rehabilitations completed in the fall-winter of 2010-2011[4] to improve service, particularly in summer, to the upper floors of apartment buildings.

5. The survey findings are summarized in the attached tables, regrouoped under four categories of questions: (i) safety, (ii) reliability, (iii) service quality and performance, and (iv) customers opinion.

6. Focus groups were also held gathering 90 participants (47 women and 43 men), and the discussions were very rich and frank. Results are summarized as follows:

7. According to focus group customers, services have improved but are still unsatisfactory:
    - on the issue of the *quality of water*: in general customers find it better, year by year;

[4] Anecdotal evidence confirmed by DVK claims records, suggests that compared to previous summers, customers experienced much improved service in the summer of 2011, with dramatically fewer reported shortages.

- on the issue of *continuity/discontinuity of the supply*: customers complain about the "on and off" patterns of the supply;
- on the issue of the *pressure*: although 30% noticed an improvement, the majority still experience weak water pressure, or even worse conditions than previously;
- on the issue of *tariffs and State/local authorities' activities on policy*: customers actively complain about the lack of information, communication and therefore transparency.

8. Focus group customers are not willing to pay more for improved services, as long as there is a lack of trust and a feeling of unfairness:
    - "it is not fair" to have discontinued services with less than 12 hours of service per day, when some households receive water 24 hours/day.
    - "it is not fair" to pay for "unused" water such as the water pumped illegally or leaking because of the deterioration of the system;
    - "it is not fair" to be unaware of how tariffs are calculated;
    - "it is not fair" to pay the same amount of money for water supply services that differ totally depending on the floor level.

9. Finally, according to focus groups, there is a general latent demand for water meter installation: Customers are willing to pay for actual water consumption or for hours of actual water supply service.

Summary of customer survey results for 70 enterprises and 1,530 households in Dushanbe

		Results of surveys of 1,530 households	Results of surveys of 70 enterprises	SUMMARY
		47% are serviced by SAM or NAP 53% are serviced by SWW or KAF	68.6% are serviced by SAM or NAP 31.4% are serviced by SWW or KAF.	
		49.8% live on a first floor **11.8% live on a second or third floor** **23.2% live on a fourth floor** **15.2% live on a fifth floor or higher**	54.3% are "socially vulnerable" organizations (schools, medical institutions, etc.) 23.8% are from the service sector (large or SME) 12.9% are from the industrial sector	
Safety	Importance given to the quality of water	For 99.5%, good quality water is important		**ON SAFETY: CUSTOMERS FIND WATER QUALITY IMPROVED, YEAR BY YEAR**
	Level of quality	**76.4% are satisfied with water quality: they are happy with the color, the taste, the scent and the transparency (results between 67.8 and 79.9%).**	In general the enterprises noted an improvement of water quality over the last 2-3 years. 88% are satisfied with it: they are happy with the color, the taste, the odour, and the clarity (results from 62 to 89.5%).	
	Awareness of higiene and sanitary risks related to bad quality water	The majority of Interviewees (over 68%) are aware of diseases which are spread via water (typhoid, fever and dysentery). 92.8% use boiled water for drinking. It is not clear whether it comes from doubts on the quality or taste preference. 58.6% are concerned first about their hygiene and sanitary conditions in the case of lack or shortage of water. Over 90% say that when it does happen, then the sanitary situation in their household is affected. However, the majority of the families confirms that noone in their households got infected (87.8% of over 1,000 families who answered the question).	All the organizations are informed about existing waterborne diseases. For 89.5%, staff has never got inffected.	
	Filter	Most interviewees have no filter (97.1%)	Most enterprises do not use filters (66.7%).	
Reliability - Access	**General satisfaction**	**60.1% are satisfied with the access to water**	81% are satisfied with the access to water	**ON RELIABILITY: ALMOST HALF OF CUSTOMERS SAMPLED EXPRESS UNSATISFACTION WITH CONTINUITY OR PRESSURE OF SUPPLY.**
	Availability of piped water service is greater than 12 hours per day	**Yes for 56.7%**	Yes for 86.6%	
	Availability, pressure of service varies seasonanally	**Yes according to 64.6%**	Yes according to 62.5%	
	Storage (revealing potential absence or shortage of water)	75.2% of interviewees store water (in plastic containers).	None. The main concern (for more than 92%) relate to the negative impact on hygiene and sanitary conditions	
	Alternative source of water	The large majority of interviewees (over 89%) do not have any alternative source of drinking water (no private/individual pump, no alternate well with pump installed, etc.). They depend therefore entirely on local water supply services.	The large majority of enterprises (over 81%) do not have alternative source of drinking water (no individual pump, no stand-by well with the pump, etc.). They depend therefore entirely on local water supply services.	
Reliability - Quantity	**Satisfaction**	**55.4% are satisfied with the quantity of water**	68.1% are satisfied with the quantity of water	
Reliability - Pressure	**Satisfaction**	**54.2% are satisfied with the pressure**	71% are satisfied with the pressure	

Service quality and performance	**General satisfaction**	**56.9% are satisfied with the level of service**	89.5% are satisfied with the level of service	**SERVICE QUALITY AND PERFORMANCE** **IN GENERAL CUSTOMERS SEE YEARLY IMPROVEMENTS BUT STILL UNSATISFACTORY. THEY ASK FOR MORE INFORMATION/COMMUNICATION/TRANSPARENCY ABOUT TARIFFS, BREAKDOWNS, ETC.**
	Contract	Only 44.2% have a formal contract with SUE DVK. Out of which 90.1% say they are satisfied with it.	89.5% have contracts with SUE DVK and almost all of them are satisfied with the terms of the contract.	
	Tariff	**81.3% are satisfied with the current price of water supply services.**	96.5% are satisfied with the current tariff rate	
	Water meter, monthly billing and payment	5.5% have installed water meters and pay based on consumption. The remaining 94.5% pay a fixed tariff. 15% do not regularly pay their bills (it takes from 2 to 12 months); in general customers would prefer a payment once or twice per year. The large majority (over 93%) get a receipt upon payment, find the invoice and the receipt clear, the method of payment appropriate. Only 4.8% have claimed for wrong billing and have in that situation addressed their claim to SUE DVK for most, or to the Housing Utility (or other) for the rest.	82.4% have water meters (all functional). The measures are read monthly, by SUE DVK for most of the enterprises (otherwise by the enterprises themselves). The payments are timely made by the enterprises. 98% receive a receipt upon payment, that hey usually find to be clear. Only 3.5% have addressed a complaint (to SUE DVK directly) about miscalculations.	
	Claims	The majority of interviewees (over 78%) do not know who to address their disagreement to, and have never submitted any claim. For those who have, for only 39.1% the problem was resolved.	The majority of enterprises (over 68%) know who to address their complaints to at SUE DVK; however, they have never submitted any claim.	
	Request for maintenance	In general it takes between a day and a week to have services after a request for maintenance. It may take a month (experience of 8.7% of interviewees).	In general it takes a day to have services after a request for maintenance (for 63.9%). It may take a weekl (experience of 30% of enterprises) or a month (experience of 6.1% of enterprises).	
	Accessibility of SUE DVK staff / Problem resolution	70.3% say they fix problems via phone (more than during visits to or by SUE DVK).	79% say they fix problems via phone (more than during visits to or by SUE DVK).	
	General information/communication on services	Customers are generally informed about new services by mass media (for 81.6%) and not SUE DVK themselves. Similarly, they learn about disconnections or emergency situations from mass media (for 54.8%) or from neighbours or relatives (for 38.6%), much more than from SUE DVK themselves (only 6.6% say they are).	The enterprises are informed about new services either by mass media (for 54%, the majority) or by SUE DVK themselves (for 46%). They learn about disconnections and breakdowns from mass media (for 82.4%) and not from SUE DVK themselves (nor from neighbours or relatives).	
Customers' opinions	Maintenance's responsibility	A majority of households (71.4%) understands that SUE DVK is responsible for performing maintenance tasks on the water supply network. 54.4% of households believe DVK must pay for such miantenance, whereas the rest (over 44%) think households or the Communical Service Unit must pay for it.	For the majority (90.9%), SUE DVK should be the main executor for repair work and for problems/complaints resolution. The entity who should pay for the repairs is - SUE DVK according to 52.6% of the enterprises interviewed, - the enterprise itself according to 44% - the housing and utilities administration or other for 3.4%.	**CUSTOMERS WITNESS IMPROVED SERVICE, BUT DO NOT ARE NOT WANT TO PAY MORE FOR IT . THEY ARE WILLING TO PAY BASED ON ACTUAL WATER CONSUMPTION.**
	Improvement of the quality of services	**The large majority of interviewees (over 96%) have noticed improved quality of services over the last 2-3 years. When asked if they would pay more for improved services, the majority (67.6%) say they are not ready.**	All organizations consider that the improvement of quality of services is important; however most (66.7%) are not willing to pay large amount of money for improved services.	
	Water usage	In general, the majority (over 70%) do not use water for other purpose than for drinking (not for gardening purposes or other)	62.5% of enterprises use water for irrigation. 39% use water for other purposes than drinking water or irrigation.	

Annex 6. Stakeholder Workshop Report and Results

Minutes of workshop held in Dushanbe on December 9, 2011 at the invitation of DVK.

1. List of participants invited by DVK:
   - N. Khairullaev, First Deputy Mayor of Dushanbe
   - F. Isupov, Director of DVK
   - Z. Nazimov, Director of PCU for DWSP
   - J. Saidov, Ex Director of PCU of DWSP
   - J. Lokaev, Ex director of PCU of DWSP
   - B. Safarov, ex director of PCU of DWSP and DVK
   - A. Hasanov, procurement specialist, PCU of DWSP
   - K. Nasimov, Financial specialist , PCU of DWSP
   - D. Primkulov, Engineer, PCU of DWSP
   - K. Muzaffarov, Engineer, PCU of DWSP
   - Pier Mantovani, World Bank, TTL
   - Serdar Jepbarov, World Bank, co-TTL
   - Leila Talipova, consultant (author of minutes)

2. The Bank has shared the final draft ICR on December 4, 2011. The TTL provided background as to the purpose of the ICR, and the rating methodology. The proposed outcome rating (moderately unsatisfactory) was explained with a detailed review of measured values for the six performance indicators. The TTL explained that both the Bank's and Borrower's performance in the Project were also evaluated as moderately unsatisfactory. The purpose of the workshop is to discuss the ICR findings and ratings for the Project and draw major lessons learnt.

3. The representative of the Borrower understand that the ICR is a document of the World Bank, not based on the Borrower's assessment. Given the short review time, it is agreed that beyond the present roundtable, DVK will gather comments on the Bank's ICR ratings through December 17, and share them with the Bank. Particular emphasis is recommended on providing factual comments, illustrated by evidence or better documentation of performance indicator data.

4. The main reactions and comments of participants are listed below.

- The final draft translated version of ICR was received just recently, and there was not enough time to prepare comprehensive comments.
- The field work in DVK of the ICR author during summer of 2010 was too short (about 2 weeks, what didn't allow detailed understanding of the progress and achievements of as long a project as DWSP1).
- There were a number of problems and delays caused by the Bank in the course of project implementation. Some of these problems may relate to:

    - significant impact of supervision on the procurement of Sodium Hypochlorite systems for SAM (in 2008 the bidding was cancelled, and the DWSP had to re-design the chlorination systems and limit it to the pilot area only).
- The Project M&E indicators target values were inappropriate (overestimated) since the start of the Project. Despite the termination of the Private Operator contract with DVK, overall physical investments were not sufficient to reach the stated targets. This warning had been conveyed by PCU to the Bank since the start of the Project.
- Change of the closing date for original credit and grant funds of the AF: the proceeds of the original credit were implemented in time, but the extension of the closing date was required to implement additional contract: rehabilitation of the DVK laboratory building and construction of canopy due to emerged new funds in USD equivalent as a result of the SDR appreciation.
- The Project M&E indicators were not given the high importance during the first years of the Project, and in particular during presence of Private Operator. The effective monitoring of the progress of the Project (where applicable) has started at the end of 2009, when under the guidance of the Bank's task team. A monitoring and evaluation specialist was hired by the PCU on a part time basis in 2010.

5. Conclusions: The minutes of the ICR workshop, and formal written comments on ICR ratings and findings (to be prepared by the Borrower (DVK and PCU) will be incorporated and annexed in the final version of the ICR.

(Minutes developed by L. Talipova, WB consultant)

Annex 7a. Summary of Borrower's ICR

The Republic of Tajikistan

State Executive Authority of Dushanbe

Dushanbe Water Supply Project

IMPLEMENTATION COMPLETION REPORT

The International Development Association of the
World Bank Credit 3664 TJ, 3664-1 TJ, Grant H-264-TJ,
Grant from Social Development Fund of Japan TF 051228,
Project Preparation Advance Q189-TJ,
Grant from Swiss Government TF021819

Dushanbe – December 2010

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5. GRANT FROM SOCIAL DEVELOPMENT FUND OF JAPAN

6. ANNEXES

1. INTRODUCTION

1.1. Project rationale.

A preliminary study and assessment of the Dushanbe water supply by international experts involved by the International Development Association (the consulting company BWS (Austria) in 2000, consultant Mr. Gunnar Demoulin in 2001 and consultant Ms. Leila Talipova in 2008), demonstrated that the water supply and sanitation in Dushanbe provided by the SUE "Dushanbevodokanal" (DVK) were at a very low level.

In reports, Consultants have noted the following:

✓ Poor condition of facilities: Water treatment and water supply networks are in continuous operation without repair and renewal, and their current technological and sanitation standards do not meet requirements.

✓ Inefficient operation: The most difficult technical issues for DVK are huge water losses and leakages in the system. The results of this situation are poor drinking water quality and unreliable water supply. The annual water production volume in Dushanbe is approximately 269.7 million m³, (or about 1400 liters per day per person, including physical losses). Water losses in the system are enormous. According to estimates, water losses per year in Dushanbe are 159 million m³, and this is 53% of water production (from which the losses in the distribution network are 16%, and 37% in the water supply lines of multi-stored houses). Moreover it does not take into account additional water savings that could be achieved through the implementation of an effective water demand management, especially in private houses with gardens. The DVK system does not have the main water meters.

✓ Unviable and lack of financial resources: Extremely low tariff rates (equivalent USD 0.004 per cubic meter for residential customers in 1998) in combination with a very low collection rate (only 20% for that period). The severe DVK financial situation means that the DVK can only work by reducing its accumulated inter-agency debts and by collecting the debts of its users and as a result of this DVK has not adequately maintained its facilities.

✓ Lack of human capacity: The rapid emigration of a large number of DVK's technical personnel as a consequence of the civil war in Tajikistan.

The Soviet Union collapsed in 1991 and in Tajikistan the situation deteriorated with provision and quality of public services such as: water supply, sanitation and solid waste management. Nowadays, there is still an acute need for rehabilitation and reconstruction of considerable part of infrastructure in order to regain the level of public services at acceptable level. But state enterprises of the utilities are unable to cope with problems due to the lack of financial resources and institutional capacities. At the same time, considerable part of infrastructure does not meet modern standards of efficiency operation.

In the framework of goals for reducing poverty in the country and improvement of life quality Tajikistan Government signed on July 3, 2002 Development Credit Agreement and received a loan (3664-TJ) in the amount of XDR 13.5 million from International Development Association for implementation of Dushanbe Water Supply Project. The main project objectives are to improve safety, reliability, efficiency and financial viability of Dushanbe water supply services.

There was project preparation phase before Credit Agreement signing, funded by a Project Preparation Fund Q189-TJ and Grant from Swiss Government TF021819. After Project preparatory phase completion and fulfillment of additional conditions of loan entry into force (signing of the Subloan Agreement between the Ministry of Finance and State Unitary Enterprise "Dushanbevodokanal", hiring an individual Operator, signing of Service Contract, and etc.) the basic Credit entered into force on October 31, 2002.

For Project implementation, coordination and monitoring, Dushanbe Municipality (Khukumat) established the Project Coordination Unit (PCU). Since 2002, this Project is implemented by PCU, SUE Dushanbevodokanal and foreign individual Operator (till February 2006), selected on a tender basis.

1.2. Project Financiers

Initially the Dushanbe Water Supply Project was funded by:

- Grant from Swiss Government TF021819 in the amount of 300,000 Swiss Francs
- Credit from the International Development Association (IDA) of the World Bank in the amount of XDR 13.5 million (at the time of signing the equivalent was 17 million USD).
- Tajikistan Government in the amount of USD 2.43 million (estimated value)

It was acknowledged during Project evaluation that investments needs for this sector are huge and full rehabilitation of water supply and sanitation system in Dushanbe would take long time, very costly and it would be gradual process. In this sense Dushanbe Water Supply Project was designed as an initial step towards improving of water supply services in the Tajik capital, focusing its implementation on more urgent works requiring immediate results. Considering current limited funds, the Project approach was to determine an annual basis, of key priorities that would have stable impact on improving of the water supply system. As a result of this approach an urgent need has arisen for immediate additional financial resources. In this regard the Republic of Tajikistan has requested the Bank to provide additional credit / grant in order to expand the scope of activities including ongoing implementation programs to improve water supply to multistoried houses, install advanced disinfecting equipment, and rehabilitate sand filters in one of the DVK water treatment plants. Agreement on additional financing was signed on Feb. 1, 2007 in the amount of XDR 2380 thousands Credit 3664-1-TJ IDA (70%) and Grant H-264-TJ (30%) XDR 1020 thousand (total equivalent 5.0 million USD).

2. PROJECT TASKS

Project intended to increase the safety, quality, reliability and efficiency of water supply, as well as strengthen the financial viability and stability of the SUE "Dushanbevodokanal". Progress in achieving Project objectives can be evaluated by monitoring of the following indicators:

- Safety and quality: the percentage of water quality samples in respective specified value of the basic parameters
- Reliability: water supply continuity. Consumers percentage who receive water for 24 hours a day;
- Efficiency: Reduction of energy consumption at the rate of 1m³/water (task – reduction of energy consumption till 20%), reduction of water losses (40 thousand m³ /day), increase records volumes of works;

- Financial viability: exceeding annual income over the sum of operating costs, maintenance expenditures and expenditures related with project implementation;
- Sustainability: satisfaction of public by water services, an agreement on effective institutional arrangements to preserve the stability of the Project achievements after its completion, perhaps with the expansion of private sector involvement.

3. PROJECT OBJECTIVES

a) strategic rehabilitation and efficiency improvement of existing facilities which are in emergency condition;
b) management and institutional strengthening of the utility of Dushanbe (Dushanbevodokanal State Unitary Enterprise -DVK) through conclusion of Service Contract (SC) with an internationally experienced water utility Operator (the Private Operator, PO);
c) strengthen of DVK financial capacity through improved financial management and commercial practices.

4. PROJECT IMPLEMENTATION OVERVIEW

The underlying principle of providing financing for the Project implementation was hiring of international Operator who has sufficient experience in this sector and the appropriate qualified personnel. According to the international selection with IDA World Bank “no-objection” a Services Contract was awarded to consortium of MVV Energie AG / HYDROPLAN (Germany) (Operator) for a period of 36 months.

In the annex "Implementation Standards" and the relevant provisions of the Service Contract the Private Operator (PO) must implement 76 tasks during three years, which have annual control indicators. During Operator’s activities the following were developed:

1. Service Payment Program
2. Training and Staff Development
3. Public Enlightenment Program
4. Commercial Management Plan
5. Energy Management Plan
6. Plan for Hydraulic Modeling Network
7. Plan for Protection and Monitoring of the Water Supply Sources
8. Plan for Repair and Rehabilitation
9. Plan for Customer Service
10. Computerized System of Billing and Tracking of Incomes
11. Network Information System Plan
12. Procurement Provision
13. Customers Service Program
14. Qualification Evaluation of the Production Personnel
15. Monitoring Guidelines for Dushanbevodokanal
16. Base Year Report
17. Sampling Program and Water Quality Monitoring
18. Report on Leaks
19. Annual Water management Balance 2004 and Indicator Detecting Direct Loses
20. Operation and Maintenance Plan

Service Contract tasks:

- Improvement of water quality and water supply continuity through water loss reduction
- Reduction of energy consumption through increase of energy efficiency of the various plants, as well as better management of facility
- Improvement of Financial viability by:
  - Introducing an appropriate tariff setting;
  - Improving collection revenues by maintaining strictest cost control in order to improve the annual ratio of collected revenue over the sum of operation expenses with project-related costs.
- Strategic rehabilitation and efficiency improvement of existing facilities, and
- General institutional strengthening of DVK.

The performance of the PO, and thus the success of the Project, will consequently have to be assessed keeping these main objectives in mind.

The Service Contract was designed very similar to other World Bank Management Contracts, notably those in Armenia (Yerevan) and Uzbekistan (Samarkand and Bukhara). Institutional environment was maybe not taken sufficiently into account and the term of the contract has, on the request of the Client, unreasonably been reduced to three years only. In the beginning Operator's work cooperation between the SUE "Dushanbevodokanal" management and the PO was problematic, because of which the PO could not take control over SUE "Dushanbevodokanal" activity in 2003. Moreover, according to the contract, Operator had to manage activity of the water production staff, including managing staff of the SUE "Dushanbevodokanal", excluding Director of the Company. Actually Operator did not control activity of the SUE "Dushanbevodokanal" staff, it was under control of DVK Director. Operator was in position of a common consultant which provided technical assistance to the company, instead of conduction required substantial change into the SUE "Dushanbevodokanal". The only positive moment in the PO activity was managing over the sales department of SUE "Dushanbevodokanal" from March of 2005, which was 1,5 year after beginning of its activity. As usual contract implementation of similar contracts takes about 5 years. According to the practice such duration of contract is reasonable, because in the initial phase of a contract implementation due to starting difficulties may not be reached any substantial progress. Decision on shortening time of the Service Contract implementation up to three years, without introduction of any simplification or optimization into the scope of tasks of the Contract, remuneration decrease was not justified. Further if will be signed such contracts we should take into account the fact of insufficiency of basic data of the company required for implementation and readiness of the managing staff to cooperate with Consultant and facilitate its activity in implementation of planned tasks.

The selection of the PO was entirely cost based (after meeting an easy to achieve technical minimum score) which has obviously encouraged (at least the winning bidder) firms to submit proposals with insufficient number of (partly insufficient qualified) staff. Institutional environment did not allow the PO to take over the management of DVK in the spirit of Service Contract. This becomes most obvious when looking at the Operation's Staff Appendix.

Many implementation delays and incompliances with the condition of the Service Contract were caused by problems in the first year:

- The POs team was weak. An insufficient number of key experts with partly insufficient qualifications (notably very limited water utility expertise)
- The lack of co-operation from DVK with respect to providing data and information in a timely fashion.
- And as a consequence, the PO prepared many poor quality reports and plans, most of them lacking an implementation schedule. This lack of proper planning was a major disadvantage and lead to the substantial negligence of fundamental elements of the Services Appendix.
- The severe financial situation of DVK, being de-facto bankrupt and with bank accounts sometimes frozen, did have an additional negative impact on the performance of the PO. It has lead, besides others, to a very high staff fluctuation and DVK's problematic situation that competitive salaries for qualified managerial, finance and technical staff cannot be paid.

Despite all of this, significant achievements were made by the PO in cooperation with DVK:

- A US$ 17 million investment program has been implemented in the shortest possible time;
- Water quality has improved;
- Supply continuity has improved;
- Many of the facilities (notably pumping stations) have been upgraded; and
- A good public relations and public education program has been developed and implemented.

On the other hand, there were several areas where the PO failed to take action or to achieve results:

- Failure to establish the required financial management and accounting systems and improve DVK's financial performance.
- Total negligence of leakage reduction until the very end of the contract. Leakage reduction always was one of the main objectives of the project as it would help to reduce operating cost and reduce water demand and thus water quality; and

Finally it can be concluded that the Service Contract was an ambitious way of achieving the development objectives but could have worked very well if:

- The main principle - an International Operator taking control over water supply staff of DVK -would have been honestly accepted by the the management of DVK;
- PCU would have been strengthened (e.g by timely engaging a Technical Auditor as early as required by the Service Contract and including continuous advice in his scope of work);
- The PO would have provided sufficiently experienced personnel, especially during the first Year of the Contract;
- The Contract was designed thoroughly, taking into account the local conditions, challenges and needs ; viz:
    - Long term of implementation;

- Was taken into account absence of basic data in DVK and time for its collection and processing;
- Accent is on institutional development of the company.;
- Contract with fixed payment and remuneration as per attained results.

(i) Strategic rehabilitation and Facilities efficiency in emergency conditions;

The main task of this section have been identified during Project preparation and included in the Repair and Rehabilitation Fund such as (a) reducing water loss and network improving, (b) water record, (c) improving water quality and water services, safety and reliability (d) strengthening of SUE "Dushanbevodokanal" operation activities through procurement of necessary equipment, transportation, computer hardware and software, (e) arrangements according to the management plan and environment monitoring. The total amount provided for repair and rehabilitation Fund was USD 13.6 million (including "other" expenses)

(a) *reducing water loss and network improving* – in pursuit of this project objective the replacement of 37 km of worn sections of the network, development and introduction of Network Information System (NIS), Hydraulic Network Modeling (HNM), zoning of the network, reducing water loss till 40,000 m³ / day were taken into account. Project Objectives were partially achieved:

- 40 km of pipelines are replaced;
- Dushanbe water supply system was theoretically divided by PO into 19 main areas of equal pressure. According to the program for water distribution network zoning at the nodal points were replaced 124 valves and rotary valves diameter from 100 to 900 mm with the installation of equipment measuring the pressure in the network. This provided an opportunity to partially regulate water flow in some areas of water distribution network. Zoning of networks requires continuation of this work, including a large amount of consulting services and physical works.
- Network Information System (NIS) had to be a main Operator's tool, and subsequently DVK's. PO has not set the NIS in the first year only basic principles were designed. Then the PO hired a consultant only the third year of Service Contract. A Consultant has supplied the software on creation and operation of the NIS and trained DVK personnel. Despite the fact that the maps were scanned, and the pipes were vectorized, facility data were not introduced and the NIS remained only in digital map. Without involvement of experienced specialists DVK will not be able independently complete the NIS and use it.
- To develop the Hydraulic Model Network (HMN) it is necessary to complete NIS. HMN was not developed, and accordingly it is impossible to complete the network zoning.

Improbable, that DVK will be able independently complete the NIS and use it in its activity.

(b) water metering – This objective was target to arrange accounting of water production, all multistoried apartments where possible must be equipped with water meters, all non-household consumers are equipped with water meters. PO had to provide procurement and installation of ultrasonic water meters to count water production in the water treatment plants. This issue is not solved. Selected supplier supplied and installed such equipment, and held related training. However, in Napornaya and Kafirniganskaya water treatment plants this equipment do not functioning because of electromagnetic interference from radio antenna and navigational equipment of airport. To avoid negative impact of radio waves to the equipment it is suggested to purchase ultrasonic meters in safety case which displayed positive results during its testing at NAP water treatment plant. In the other two water treatment plants measuring equipment are

installed but not operated by DVK. Due to the breach of the contract conditions the contract on supply of the equipment was terminated and the equipment was not accepted. Operator procured 2,500 water meters to measure the amount of water consumption by population and 800 out of that were installed in the clean water zone. Water meters installation for that period was not possible due to poor water quality, which could lead to blocking or frequent failure of water meters. At present, DVK on its own continuing works, it was possible after operation of the daily sedimentation pond.

(c) improving water quality and water services, safety and reliability – This goal was target to improve water quality through rehabilitation of water treatment facilities (rehabilitation of daily sedimentation pond (DSP), to increase safety and reliability through piloting of water disinfection system with sodium hypochlorite at the SAM WTP, replacement of pumps and electrical equipment at all water treatment plants, reconstruction of existing sand filters in the NAP, rehabilitation of booster pumping stations for high-rise buildings, etc.

The failed and inactive DSP was cleared from accumulated sediment in the amount of 200000 m³. It was the first stage of reconstruction. The second stage of reconstruction was implemented from IDB (Islamic Development Bank) Credit. Since commissioning of DSP in 2009, city residents in (approximately 290,000 people) do not use untreated water from Varzob river. Also in the frames of this Contract accumulated sediment were cleared from NAP. After commissioning of the DSP the processing of water coagulation at the plant was put into operation due to the procurement of the coagulant. This allowed providing clean water to 80,000 and even more Dushanbe residents.

Pumps and electrical equipment were replaced in the 1st and 2nd lifts in Kafarnigan groundwater intake (KAF), Southwestern groundwater intake (SWW), and Samatechnaya WTP. These activities helped to increase the growth of underground water till 13% and provide reliable and uninterrupted water supply to those plants. For the Napornaya WTP electrical equipment had been procured, but it was not installed due to lack of insufficient funds for the construction of new machine room and reservoir. Existing facility of machine room was built in 1936 and that facility is in critical condition.

The Project is fully upgraded pumps and electrical equipment with related elements in the 69 out of 101 Dushanbe water pumping plants, and this allowed improving water supply to 110 people living in the multi-stored houses. At the amount of additional project financing currently two contracts are in the process - Reconstruction of the existing sand filters at Napornaya water treatment plant of DVK and implementation of a pilot plant for water disinfection with sodium hypochlorite in the Samatechnaya water treatment plant. After commissioning of filters the drinking water will meet state and after installation of new disinfection technologies safety and reliability of chlorination process on Samatechnaya would be provided.

(d) strengthening of SUE "Dushanbevodokanal" operation activities by procurement of necessary equipment, transportation, computer hardware and software. During Project implementation at the request of SUE Dushanbevodokanal there were procured necessary repair equipment, transportation, special clothing, communications equipment, computer hardware and software, as well as consumables, including petroleum, chlorine, coagulant, spare parts for equipment and etc., necessary for the daily DVK activities. This goal is a temporary, which was completed in 2006.

(e) Arrangements according to the management plan and environment monitoring
Management and Environmental Monitoring Plan (MEMP) was developed in order to prevent impacts on environment, this Plan is fundamental to the Project activities, the environmental

protection in the scope of Project is carried out in accordance with the requirements of the World Bank's environmental assessment as described in OP / BP / GP 4.01, as well as laws and regulations of the Republic of Tajikistan on the examination of environmental and impact assessment. The original MEMP version was issued on August 2000 and updated on September 2006. MEMP goals are to identify the main impact on the environment, social and human health as a result of the Project, to propose actions to decrease significant adverse impacts, and determine monitoring programs.

Investment Program of Dushanbe Water Supply Project is financed by the International Development Association of the World Bank (IDA) and by the Tajikistan Government. During MEMP implementation the Project has no significant adverse impact on the environment and does not threatens to human health: thus the World Bank for the purpose of OP 4.01 assigned category "C" to the Project. Project offers significant benefits to the environment and human health, in particular, improving the sustainability of water supply sources by reducing losses and wasteful water use, reducing energy use through highly efficient operation and improving public health through good quality of treated water.

(ii) Institutional Strengthening of DVK activity-based on Operator's Service Contract

SUE "Dushanbevodokanal" was established as a State Unitary Enterprise in accordance with the Law on State Enterprises, the decision of the Chairman of Dushanbe dated May 3, 2002, whose founder is the State Executive Authority of Dushanbe. The main duties and functions of DVK are:

- Meeting the needs of consumers in supplying of safe drinking water;
- Collection and treatment of waste waters
- Operation and maintenance of basic facilities of water supply and wastewater.

In accordance with the terms of Service Contract Operator has assessed the qualifications of DVK production personnel, designed and implemented staff training, has prepared Operation and Maintenance manuals, and trained under this program, as well as within Project implementation relevant DVK experts were trained and acknowledged with computerized accounting system.

Operator transformed DVK arrangement structure (financial, audit and public relations departments, etc.); moreover Customer Department was completely under the direct control of the PO for the fixed time.

One of the Service Contract items was that the PO had to manage all DVK personnel involved in water supply, except the Director. The functions of the PO were:
• Daily direct management of water production personnel;
• Establishment of arrangement structure of water production personnel;
• Activity assessment of water production personnel and others

Actually the PO was not given the opportunity to manage personnel fully, thus it did not allow the PO to achieve tangible results on the relevant control tasks.

(iii) Strengthening the SUE “Dushanbevodokanal” financial capacity through improvement of financial management of the sales department.

In respect of finance and accounting the PO in the scope of Service Contract had developed and introduced computerized information system of financial management, accounting and reporting

for both the DVK and for the PCU, and based on these systems submit different reports, including financial reports, tax reports, Project Management Reports, etc. The PO was also responsible for water supply and sanitation billing and for payments collection to DVK.

Statistics shows a steady tendency of payment reduction level in 2004 and 2005 and gradual increase year by year during Project implementation. Period of the PO's activity indicated negative changes in administration system for collecting payments over a period of project implementation. Incorrect billing along with significant shortcomings of possibilities to provide services and improper administration **increased the level of consumer's rejection to pay the bills** and extend consumers agreement. Especially these factors clearly appeared **in 2004 and 2005**. During this period, billings dramatically increased (the amount of unfairly billing on the certain consumers categories resulted in threefold overestimation) and level of collection significantly reduced.

According to the Service Contract Operator had to collect all DVK bills for water supply and sewerage (through the sales department, the banks, cassiers and other terms agreed with PCU), define and record all unpaid bills, present to PCU the list of all debt customers, take measures on penalty of debt customers and develop procedures on collection of bills, provide it for PCU consideration and approval. Operator had present in its quarterly reports to PCU summary анв analysis of unpaid bills.

Actually collection of bills was administrated absolutely contrary to the conditions of the Service Contract. It was DVK proceeding with collection of bills for water supply and sewerage and did it in the manner as it was before. Only from time to time Operator was allowed to take part in this process. Operator could not set duly control over record system of DVK and accordingly accounting system as it was stipulated in the Contract was not introduced in DVK. So instead of billing, collection of bills, providing its truthful data on billing of customers, collected bills and the service of the customers, operator had to request for such data different departments of DVK. Operator had no opportunity to assure its correctness (arithmetical correctness) or correspondence to the requirements, just provided it to PCU in its quarterly reports (sometimes commenting discrepancies). For example, DVK management was not able control and check billed customers who have not paid their bills, so operator could not provide this data to PCU. Hence data on billing and collection of bills provided by the PO in its reports was not adequate in point of its correspondence to the requirements of the Service Contract, which was caused by the lack of DVK facilities and supervision. Particularly wrong was data on billed customers and debt of customers.

For 5 months of 2010 collection from **population increased to 95%** compared to **70%** level (as per project evaluation indicator) and commercial billing has reached **95 %** in compare to **94%.** (as per project evaluation indicator). These levels of billing collection were attained due to DVK management efforts. Payments are closely related to consumer billing. Payment of domestic consumers is made simultaneously with the issuance of bills (receipts). These tasks are carried out by controllers. The main reasons for increasing of payment collection over the last four years and the current period of 2010 on the domestic consumers (population) may be analyzed from the Table No.1

Statistics of 2002 up to 5 months of 2010 on the payment collection from population shows an increase from 22% up to 95% and it can be explained by the following factors:

- Tariff increased in 12.9 times for the current period as compared with 2002;
- The number of inspectors increased on domestic consumers;
- Refusal of DVK for payment collection in 2004 by the housing utilities on domestic consumers;

- Agitation and propaganda among the population for the payment of performed services through the current account of DVK;
- Involvement of inspectors by opening encouraging fund for payment collection, etc.

Financial Assessment on Indicators during project implementation

Table No. 1

Technical and financial indicators on incomes and expenditures

Thousand TJS

Indicators	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**
Total income	**1316**	**2959**	**4351**	**7798**	**6966**	**9229**	**15772**
Receipt of sales	1054	2781	3890	7751	6621	8813	14314
Other incomes	262	178	461	47	345	416	1458
Expenditures							
Salary			864	2193	1796,8	2022	3320
Allocation to Social fund			216	548	449,2	506	830
Materials			487	1249	1193	1065	1967
Spare parts					168,6	145	589
Electrical energy					1479	1665	3723
Fuel and lubricating					490	982	1890
Charges, taxes					89,4	368	741
Other operational costs					1994	2661	3600
Administrative costs					2666	2011	2654
Other expenditures					324	482	0
Total of operational costs					**10650**	**11907**	**19313**
Depreciation of fixed assets					2772	4717	4792
Total:					**13422**	**16624**	**24105**
Interest and financial expenditures					4506	1233	860
Total expenditures	**5207**	**6858**	**9336**	**15425**	**17928**	**17857**	**24965**
Income (loss)	**-3891**	**-3899**	**-4985**	**-7627**	**-10962**	**-8628**	**-9192**

In general, paid incomes level does not cover production costs. For example: in 2008 DVK incomes were 15,772 thousand TJS while the expenses amounted to 24,965 thousand TJS, hence DVK losses were 9192 thousand TJS. Table No.2 summarizes DVK financial data on incomes and expenses.

Analysis of DVK financial data

Table *№ 2*

Title	**Unit**	**2006**	**2007**	**2008**	**2009**	**2010 (5 months)**
Water production and sold water						
Water production	000 m3	276726	246556	238376	246754	**104530**
Water loss (technical and non-technical)	000 m3	201346	170721	176162	188497	80703
Volume of sold water (billed)	**000 m3**	**75380**	**75835**	**62214**	**58257**	**23827**
Population	000 m3	42850	39511	33992	35587	15549
Commercial/Industrial	000 m3	4801	3895	4048	3643	1498

Budgetary organizations	000 m3	19768	17579	16437	14808	5649
Other customers		7961	14850	7738	4219	1131
Approved water tariff rates -see Note 1 below						
Population	Thousand m^3	0,025	0,042	0,1	0,118	0,139
Commercial/Industrial	Thousand m^3	0,279	0,45	0,75	0,85	0,92
Budgetary organizations	Thousand m^3	0,087	0,14	0,3	0,35	0,413
Other customers	Thousand m^3	0,279	0,45	0,75	0,85	0,92
Realized water tariffs - see Note 2 below						
Population	Thousand m^3	0,041	0,060	0,117	0,159	0,182
Commercial/Industrial	Thousand m^3	0,630	1,046	1,461	2,016	1,892
Budgetary organizations	Thousand m^3	0,159	0,236	0,441	0,599	0,700
Other customers	Thousand m^3					
Average realized water tariff	**Thousand m^3**	**0,105**	**0,139**	**0,275**	**0,376**	**0,404**
Billed water revenues (including VAT)						
Population	Thousand TJS	1775	2363	3974	5660	2829
Commercial/Industrial	Thousand TJS	3023	4075	5916	7345	2834
Budgetary organizations	Thousand TJS	3147	4147	7244	8877	3952
Total billed revenues (including VAT)	Thousand TJS	**7945**	**10585**	**17134**	**21882**	**9615**
Total billed revenues (excluding VAT)	Thousand TJS	**6621**	**8821**	**14278**	**18235**	**8013**
Collected water revenues (including VAT)						
Population	Thousand TJS	1559	1953	2642	4990	2695
Commercial/Industrial	Thousand TJS	2024	2786	4907	7304	2680
Budgetary organizations	Thousand TJS	3036	3790	5873	8770	4297
Total collected revenues (including VAT)	Thousand TJS	**6619**	**8529**	**13422**	**21064**	**9672**
Total collected revenues (excluding VAT)	Thousand TJS	**5516**	**7108**	**11185**	**17553**	**8060**
	Thousand TJS					
Collection ratio (5)						
Population	%	88	83	66	88	95
Commercial/Industrial	%	67	68	83	99	95
Budgetary organizations	%	96	91	81	99	109
All consumers	**%**	**83**	**81**	**78**	**96**	**101**
Operating expenses						
Salaries & wages	TC/m3	1797	2022	3320		
Social fund contributions	TC/m3	449	506	830		
Materials and Spare parts	TC/m3	1362	1210	2556		
Electrical energy	TC/m3	1479	1665	3723		
Fuel	TC/m3	490	982	1890		
Taxes & compulsory contributions	TC/m3	89	368	741		
Administrative expenses	TC/m3	2666	2011	2654		
Other cash operating expenses	TC/m3	2318	3142	3600		
Total operating expenses	**TC/m3**	**10650**	**11906**	**19314**		
Depreciation	TC/m3	2772	4717	4792		
Total operating expenses	**TC/m3**	**13422**	**16623**	**24106**		
Interest expense & financial charges	TC/m3	4506	1233	860		
Total expenses	**TC/m3**	**17928**	**17856**	**24966**		

Annual working ratio - see Note 3 below	**ratio**	**1,93**	**1,68**	**1,73**		
Current assets and liabilities						
Accounts receivable from residential customers	TC/m3					
Accounts receivable from budgetary customers	TC/m3					
Accounts receivable from other customers	TC/m3					
Total accounts receivable	**TJS 000**	**2527**	**2408**	**4349**		
Other current liabilities	TC/m3	10898	9573	5539		
Total current assets	**TC/m3**	**13425**	**11981**	**9888**		
Trade accounts payable	TC/m3	6435	5324	9019		
Other accounts payable	TC/m3	2872	5177	6134		
Other current liabilities	TC/m3					
Total current liabilities	**TC/m3**	**9307**	**10501**	**15153**		
Current ratio (cuuent assets/current liabilities)	**ratio**	**1,44**	**1,14**	**0,65**		
DVK's share of annual debt service - see Note 4 below						
Interest & financial charges						
Loan principal repayment	TC/m3		1233	860		
Total annual debt service	TC/m3		25	422		
Current ratio (cuuent assets/current liabilities)	**TC/m3**		**1258**	**1282**		

Notes:

1. Approved tariffs are the tariff levels approved by the municipal/regional authorities.
2. Realized tariffs are the tariff levels actually realized by DVK; they are calculated as annual billed revenues divided by annual billed volume.
3. Annual working ratio is annual cash operating expenses divided by annual collected revenues (excluding VAT).
4. DVK's share of debt service is the share that DVK is actually expected to pay; the share of debt service to be paid by the Government should be excluded.

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The part of accounts receivable of enterprise became like a weak warranty for reimbursement of costs. Also DVK tries different ways to convince customers to pay their bills through collection inspectors; representatives of multistoried apartments or community administration.

International consultants completed to provide individual consultancy on financial management who was selected on a tender basis under the additional Project financing. During the annual period from December 2007 Consultant fulfilled significant work aimed to improve DVK financial management:

- Initial financial activity was evaluated, report describing the strengths and weaknesses was prepared and submitted;
- Development and supervision over plan implementation within fixed time for improving enterprise financial management;

- Development and implement of accounting policies, adaptation of modern technologies of management accounting, development set of key indicators to monitor enterprise financial activity;
- Development and adaptation of accounting regulations and procedures;
- Certification of accounting and sales department personnel;
- Supervising DVK quarterly and annual progress reports;
- Consulting support to financial personnel and PCU management concerning Project implementation, etc.

Also within Additional Financing specialized local company is adapting accounting software 1C to DVK and PCU: Accounting, whose tasks include:

- Review of current accounting system of DVK and PCU;
- Setting up of current local network in accordance with the 1C software;
- Setting up of current 1C software in accordance with the PCU requirements;
- Setting up current software based on 1C in accordance with the requirements of DVK;
- Adaptation of billing system. Installation of network billing system in the DVK sales department;
- Training for PCU to use the software (an individual training - 3 specialists);
- Group training of DVK accounting personnel (15 specialists - 50 hours);
- Consulting support during introducing process of incoming balance of all accounts of the accounting for DVK and PCU.
- Training of DVK sales department personnel to work with billing system (50 hours of group training);
- Consulting support for introducing consumers database details in billing system;
- Development of manuals for DVK and PCU personnel;
- Ongoing support and maintenance of software in the DVK and PCU;

The Public Institute of Professional Accountants and Auditors of Republic of Tajikistan carried out three courses to enhance the skills of accounting personnel of the SUE "Dushanbevodokanal" in International Financial Standards of Reporting:

- Financial Accounting - 1 (25 DVK specialists, 60 hours);
- Management Accounting - 1 (15 DVK specialists, 60 hours);
- Laws & Taxes (15 DVK specialists, 60 hours)

Tests were taken after completion of courses and certificates were issued.

Financial and Economic Department of DVK is responsible for tariff calculation and elaboration. Furthermore, approval of the Department for the State Agency on antimonopoly policy and entrepreneurship support under the Government of the Republic of Tajikistan is required.
Tariffs are reviewed in irregular intervals, although there is a regular pattern operating for the last three years. The last tariff adjustments took place in 2004, 2007, 2008, 2009 and 2010.

From February 1, 2010 by the Decision of the Ministry of Economic Development and Trade under No.3 dated 12.02.2010 new tariff on drinking water and sanitation was introduced (increased percentage by the grouped consumers):

- *For population +12,2%*
- *For budgetary + 11,8%*
- *For commercial + 5,2%*

Based on tariff increase for the electric power.

5. GRANT FROM THE JAPANESE SOCIAL DEVELOPMENT FUND

In addition to the main Project, Japanese Social Development Fund (JSDF) awarded a Grant (TF 051228) to work with communities to manage urban water supply, grant was aimed to improve safety and reliability of water supply systems in multistoried apartments in Dushanbe which participated in the Project.

PCU with the support of international NGO – TBW, Technical Consultancy for Land and Water Use LLC implemented this Project. The Project was funded by:

- JSDF Grant IDA USD 2,539,000
- Government and communities involved in the Project: Estimated USD 317,000;

5.1. The main objectives and tasks of the JSDF

- Establishing or institutional strengthening based on freewill association of homeowners - Communities;
- Removal of intra-houses and intra-apartments leaks through the rehabilitation, replacement and repair of water distribution systems and water fittings inside the multi-stored houses, apartments and communities involved in the Project;
- Training and stimulation of Communities for further independent operation and maintenance of intra-houses water supply systems

5.2. Results Achieved

In the framework of the Project in Dushanbe formed 42 Communities based on freewill association of apartment residents in residential districts and private houses in the communities. Including:

- 5 communities in Shohmansur district
- 4 communities in Somoni district;
- 12 communities in Firdausi district;
- 21 communities in Sino district.

Communities have been formed under the existing laws of the Republic of Tajikistan and underwent state registration in Ministry of Justice;

- During the Project implementation period rehabilitation works were completed in 46 sub-projects in the newly formed communities that encompass 393 and 566 multi-stored private houses with total population 47,068 people.

6. PROPOSALS

Dushanbe has a sharp relief of the territory with a difference in altitude from north to south about 150 meters, water supply zoning is required in order to ensure sufficient amount of water and pressure head to consumers. Water supply zoning in Dushanbe was started about 35 years ago, when first water lines and pressure-regulating reservoir zones were constructed. At the present time, all necessary reservoirs and part of the water supply lines are constructed. Completion of Network Information System and Hydraulic Model Network are necessary to complete city water supply network zoning. Then it would be possible to define the entire scope of the works and the cost of zoning, including construction of unfinished water lines, communications, central pipe fitting and required metering equipments and etc.

Practice has shown that most Plans and Programs developed by the PO, which had to improve DVK activity in operation of existing facilities, reducing energy consumption, water quality control, financial management, work with customers were not implemented due to the following:

- Low qualification of DVK staff;
- High rate of fluctuation of DVK staff;
- Introduction of plans and programs should be supervised by its designers or experienced specialists at least in its initial phase of implementation;
- Permanent control of the management ;
- Lack of permanent qualification improvement and accreditation of DVK staff.

We think it is necessary to attract experienced international consulting companies, who together with DVK specialists would start to implement programs. The Project has procured a complete set of equipment to detect leaks. The Supplier of the equipment carried out training for DVK personnel. In the procurement plan of Additional Financing was included hiring an individual international consultant for leaks. Survey of 60 km. water supply lines in Dushanbe was provided for 2 months, a working group from DVK was created for the continuing effort to detect leaks and to develop the structure and position of detection group and remove DVK leaks. These activities were not fulfilled because of small dedicated budget and large amount of the works considered in a short period. Taking into account this important component for further DVK activity, it is necessary to continue support of DVK through involvement of experienced international consultants for a long period to detect leaks covering the entire Dushanbe water supply system.

ANNEXES TO BORROWER ICR:

Annex 1: Information on financing and expenditures of funds from Project financiers.

Annex 2: Monitoring and Evaluation Indicators[5]

Annex 3: Information on Implemented Contract of the Dushanbe Water Supply Project.[6]

[5] Not provided (ndlr)
[6] Not provided (ndlr)

Borrower ICR Annex 1: Information on financing and expenditures of funds

1. Development Credit Agreement, Credit 3664-TJ (As of August 1, 2010)

Component & Categories	IDA Credit 3664-TJ		Government Input		Total
	Million USD	%	Million USD	%	Million USD
Component A. Repair and Rehabilitation Fund of Water Supply System in Dushanbe:					
Works …….	4.97	89.9	0.56	10.1	5.53
Goods……..	12.00	98.1	0.23	1.9	12.23
Recurrent costs of DVK…….	0.28	82.4	0.06	17.6	0.34
Total on Component A…….	17.25	95.3	0.85	4.7	18.1
Component B. Service Contract Provision:					
Management services…….	1.56	69.0	0.70	31.0	2.26
Total on Component B……	1.56	69.0	0.70	31.0	2.26
Component C. Project Management:					
Consultant's services, training, auditing….	0.69	84.1	0.13	15.9	0.82
Incremental operating costs……	0.35	79.5	0.09	20.5	0.44
Total on Component C……	1.04	82.5	0.22	17.5	1.26
TOTAL (Actual) ……..	**19.85**	**91.8**	**1.77**	**8.2**	**21.62**
TOTAL (Expected at closing date) ……	**19.93**	**91.8**	**1.78**	**8.2**	**21.71**
According to PAD plan…….……	*17.00*	*87.5*	*2.43*	*12.5*	*19.43*

2. Additional Financing, Credit 3664-1-TJ / Grant H264-TJ (As of August 1, 2010)

Component & Categories	IDA Credit 3664-1-TJ/Grant H264-TJ		Government Input		Total
	Million USD	%	Million USD	%	Million USD
Component 1. Provision and installation of sodium hypo-chlorine equipment for disinfection of water: Goods ……	1.23	98.4	0.02	1.6	1.25
Component 2. Rehabilitation of rapid sand filters at the Napornaya Water Treatment Plant: Works	0.84	89.4	0.10	10.6	0.94
Component 3. Provision of additional equipment to complement on-going works, in particular, the rehabilitation of booster stations: Goods …	0.50	87.7	0.07	12.3	0.57
Component 4. TA for utility management, financial management and accounting, water distribution network zoning and leak detection, and institutional, financial and technical studies, as well as audits: Services, including audit ……	0.71	88.8	0.09	11.2	0.80
Component 5. Assistance with Project management, including financing of operating					

costs: Operating costs……..	0.32	86.5	0.05	13.5	0.37
TOTAL (Actual) ……..	**3.60**	**91.6**	**0.33**	**8.4**	**3.93**
TOTAL (Expected at closing date) ……	**5.17**	**88.0**	**0.70**	**12.0**	**5.87**
According to PAD plan…….	5.00	88.0	0.68	12.0	5.68

3. JSDF Grant Number TF051228: Community-based Urban Water Supply Management Project (supplement to Dushanbe Water Supply Project) (Completed)

Component & Categories	Grant TF051228		Government		Communities Contribution		Total
	1000 USD	%	1000 USD	%	1000 USD	%	1000 USD
Part A. Creation and capacity building of CBOs to manage communal systems:							
Consultant's services	398.9	100					398.9
Part B. Small works and materials to repair communal distribution systems:							
Works	636.3	75.6	42.3	5.0	163.0	19.4	841.6
Goods	1,170.0	91.3	111.1	8.7			1,281.1
Part C. Training activities to CBOs and capacity building of CBO Association	78.0	100					78.0
Part D. Capacity building for M&E and interaction with NGOs and CBOs:							
Consultant and sociologist services….	35.5	100					35.5
Part E. Audits:	0	0					0
TOTAL (Actual)	**2,318.7**		**153.4**		**163.0**		**2,635.1**
According to the Agreement	2,539.0		According ly		According ly		Accordingly

4. Grant of the Swiss Government TF 021819 for project preparation (Fully disbursed)

Component & Categories	Grant TF 021819		Government Input		Total
	Million USD	%	Million USD	%	Million USD
Component 1. Consultant services:	0.19	100.0	0	0	0.19
TOTAL (Actual) ……..	**0.19**	**100.0**	**0**	**0**	**0.19**
According to the Agreement …….	0.22	100.0	0	0	0.22

Annex 7b. Borrower's comments on final draft ICR

[Officious translation of Russian original]

From:	To:
Government of Tajikistan First Deputy Chairman of Dushanbe City Date: 15/12/11	Task Team Leader Dushanbe Water Supply Project Mr. Pier Francesco Mantovani

Dear Mr. Mantovani,

Local Government Executive Body of Dushanbe City assures its highest esteem to you and informs that during Project appraisal it was acknowledged that investment needs for this sector are high, and that full rehabilitation of water supply and sewerage systems in Dushanbe would be a long, expensive and staged process.

The Dushanbe Water Supply Project was developed as an initial step towards improvement of water supply services in the capital of Tajikistan with focus on implementation of the most urgent works that require immediate results.

The essential condition for Project implementation financing was the recruitment of the international Private Operator who had enough sector experience and relevant qualified staff. Following an international tender approved by IDA, the Service Contract was awarded to MVV Energie AG/ HYDROPLAN (Germany) (Operator) for 36 months.

Pursuant to the SC, the Private Operator was obliged to implement 76 tasks, with annual targeted values, and to be achieved within three years.

Detailed analysis of Operator's performance and Project execution was provided under the Technical Audit conducted by “Limberger and Partners” company. The main conclusion was that the Service Contract was ambitious. Actually, it was not realistic to achieve targeted values in three years. It should be noted that originally the Project was considered for five years of implementation.

Comments on the performance indicator values:

a) ***Safety***
Half of Dushanbe’s population is supplied from the surface water source of the Varzob river. “Napornaya” and “Samotechnaya” water treatment plants, which treat surface water, have been operating for more than 50 years and were not meeting potable water quality standards at the time of Project commencement. This maintained a risk of infectious disease outbreak among the population. The quality of water supplied to population and its disinfection improved substantially after implementation of certain contracts at these two plants under the Dushanbe Water Supply Project. The cases of typhoid fever decreased from 177 in 2004 to 0 in 2010, pursuant official data that was provided by the State Sanitary and Epidemiologic Control Center of Dushanbe city (this data was also submitted to the World Bank in the report of the Monitoring

and Evaluation Consultant). Due to that fact, the one of the main Project Development Objectives regarding provision of the population safety was achieved.

b) ***Power consumption***

Currently volumes of water consumption are not measured at any of the four DVK water production sites, which supply potable water to the city, due to absence of bulk meters. There are no meters installed at the outlet of pump station of the right bank zones IV and V and left bank zone IV. Volumes of water produced are estimated by DVK based on the capacity of the installed pumps. This method does not provide actual production measurements. Energy consumption at DVK sites is measured by meters that are the property of the energy utility. The adopted monitoring indicator for energy consumption in the Project is the ratio of energy consumed per volume of water produced per annum (increase from 0,38 in 2002 to 0,52 in 2010). The indicator developed by this method doesn't reflect real conditions.

It should be noted that this Project was the first one implemented during the period of transition economy in the socially significant DVK service area. It was the first time that DVK was faced with World Bank procurement procedures, international standards and rules of urban water supply utility management, financial management, legal reforms, hydraulic modeling of water supply network and other new technologies. Actually, during Project implementation DVK staff were trained and received basic knowledge for the above mentioned.. The experience obtained during the first phase of the Project was successfully applied by DVK staff together with the new WB team during the second implementation phase (Additional Financing: improvement of water quality at “Napornaya” Station; new disinfection technology at “Samotechnaya” Station and rehabilitation of 30 booster stations).

The view of the former heads of the Dushanbe Water Supply Project Coordination Unit is that the overall Project rating presented in the Implementation Completion and Results Report as “Moderately Unsatisfactory” is not objective and is not accurate.

In this regard we consider the overall Project rating of “Moderately Unsatisfactory” be judgmental and not taking into account the above mentioned arguments, and we request to consider the objective factors in presenting the final Project rating.

Local Government Executive Body of Dushanbe city expresses appreciation to the World Bank for fruitful and mutually beneficial cooperation in investing into modernization of socially significant urban sector which is Dushanbe water supply sector.

Sincerely N. Khairulloev

Annex 8. Comments of Cofinanciers and Other Partners/Stakeholders
N/A

Annex 9. List of Supporting Documents

Aide memoires 1998-2011

Demoulin, Gunnar (2001). *Proposed Dushanbe Water Supply Project (Version 01): Preparation of a Program for Improving the Water Production Facilities.* Report prepared for the World Bank.

Dushanbe Vodokanal (2000). *Business Plan of Dushanbe Vodokanal. Second Draft.* Dushanbe, Tajikistan.

Implementation Status and Results Reports (ISRs) from August 2002 to December 2010.

Liemberger & Partners GmgH (2006). *Review of the Operator's Performance: General Problem Analysis Report.* October 2006. Dushanbe, Tajikistan.

Liemberger & Partners GmgH (2006). *Audit of the Operator's Year 2 and 3 Performance: Audit Report.* October 2006. Dushanbe, Tajikistan.

Liemberger & Partners GmgH (2005). *Audit of the Base Year Data Report: Audit Opinion Statement.* April 20, 2005. Dushanbe, Tajikistan.

Liemberger & Partners GmgH (2005). *Audit of the Operator's First Year Performance.* April 20, 2005. Dushanbe, Tajikistan.

Nematullo, Abdulloev (2010). *Final Report No. 4 on Monitoring and Evaluation of the Results of Dushanbe Water Supply Project.* Dushanbe, Tajikistan.

Procurement Post Review 2007

TBW Technical Consultancy for Land and Water Use Ltd. (2007). *Community-Based Urban Water Supply Management Project: Final Report of Consultant.* July 2007. Dushanbe, Tajikistan.

The World Bank (2002). *Project Appraisal Document on a Proposed Credit in the Amount of SDR 13.5 million (US$17 million equivalent) to the Republic of Tajikistan for the Dushanbe Water Supply Project.* Report No. 24006-TJ. May 20, 2002.

IBRD 38980

TAJIKISTAN

DUSHANBE WATER SUPPLY PROJECT

Main Components of Water Supply System

WATER TREATMENT PLANTS AND WELLFIELDS

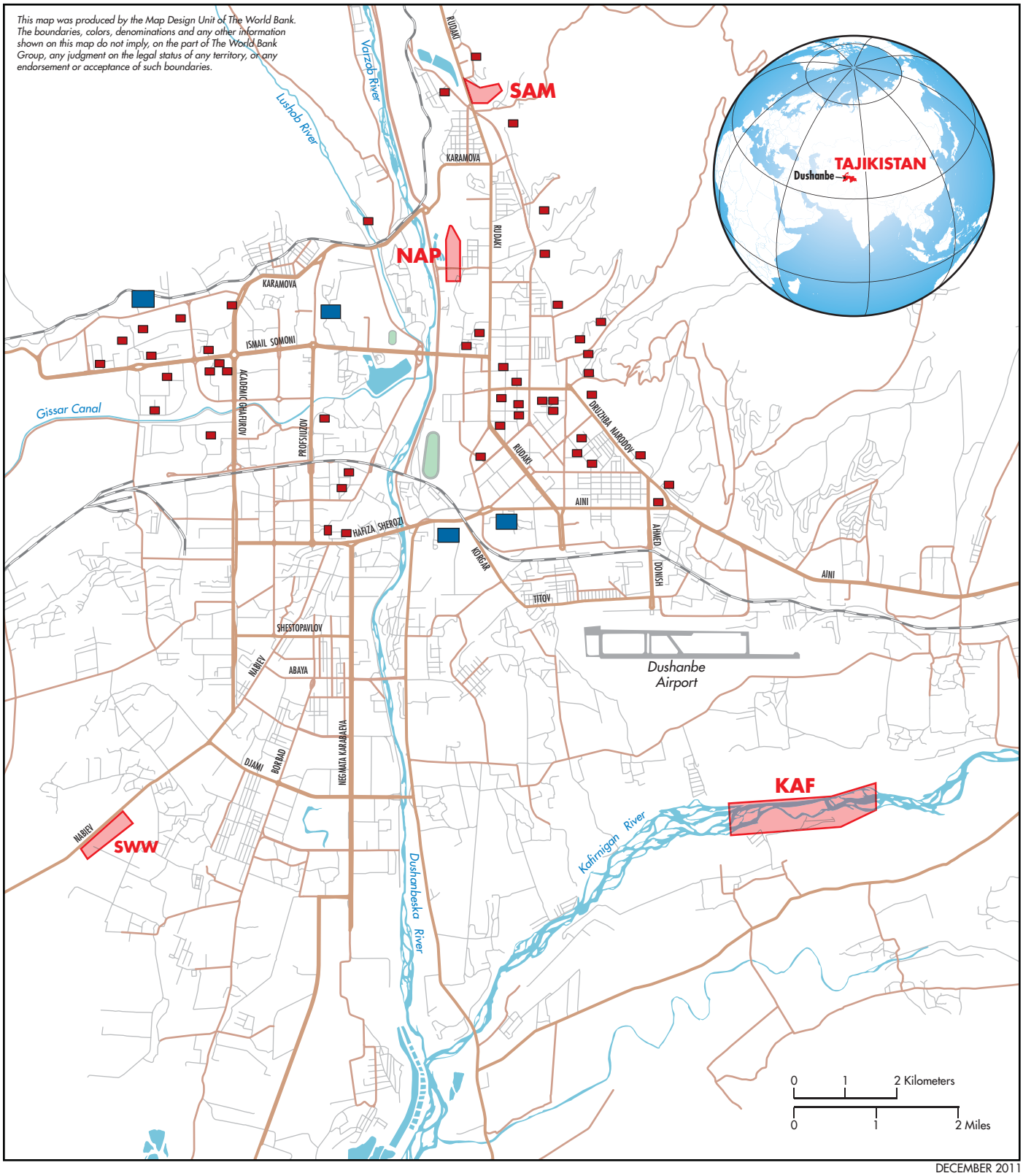
THIRD STAGE PUMPING STATIONS

TREATED WATER STORAGE

MAIN ROADS

SECONDARY ROADS

RAILROADS



DECEMBER 2011