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Report No: ICR0000448

IMPLEMENTATION COMPLETION AND RESULTS REPORT
(IBRD-44450)

ON A

LOAN

IN THE AMOUNT OF US\$55.0 MILLION

TO THE

HASHEMITE KINGDOM OF JORDAN

FOR A

AMMAN WATER AND SANITATION MANAGEMENT PROJECT

June 28, 2007

Sustainable Development Department (MNSSD)
Iran, Iraq, Jordan, Lebanon, Syria Country Department (MNC02)
Middle East and North Africa Region

CURRENCY EQUIVALENTS (Effective February 12, 2007)

Currency Unit = Jordanian Dinar (JD)

JD 1.00 = US\$ 1.41 US\$1.00 = JD 0.71 €1.00=US\$1.30

FISCAL YEAR

January 1 to December 31

ABBREVIATIONS AND ACRONYMS

AWSMP	Amman Water and Sanitation Management Project
CAS	Country Assistance Strategy
CIDA	Canadian International Development Agency
CIP	Capital Investment Program
EIB	European Investment Bank
EIRR	Economic Internal Rate of Return
GOJ	Government of Jordan
GTZ	Gesellschaft für Technische Zusammenarbeit
IBRD	International Bank for Reconstruction and Development
ICB	International Competitive Bidding
IEG	Independent Evaluation Group (of the World Bank), ex OED
IS	International Shopping
ICR	Implementation Completion and Results Report
KfW	Kreditanstalt für Wiederaufbau
JVA	Jordan Valley Authority
LEMA	Suez Lyonnaise des Eaux-Montgomery Watson Arabtech Jardaneh
MC	Management Contract
MOP	Ministry of Planning
MOWI	Ministry of Water and Irrigation
NCB	National Competitive Bidding
NPV	Net Present Value
OED	Operations Evaluation Department (of the World Bank)
OIF	Operating Investment Fund
PHRD	Policy and Human Resources Development
PMU	Planning and Management Unit (project implementation unit)
PSP	Private Sector Participation
RFP	Request for Proposal (for the management contract)
RFQ	Request for Prequalification for the management contract
SA	Statement of Expenditures
TA	Technical Assistance
TOR	Terms of Reference
UFW	Unaccounted for Water
USAID	United States Agency for International Development
WAJ	Water Authority of Jordan

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Project Team Leader: Suhail Jme'an

ICR Team Leader: Sana Agha Al Nimer

HASHEMITE KINGDOM OF JORDAN

AMMAN WATER AND SANITATION MANAGEMENT PROJECT

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MAP IBRD No.: 29333R

A. Basic Information			
Country:	Jordan	Project Name:	JO-AMMAN WATER & SANITATION
Project ID:	P048521	L/C/TF Number(s):	IBRD-44450
ICR Date:	06/29/2007	ICR Type:	Core ICR
Lending Instrument:	SIL	Borrower:	GOVERNMENT OF JORDAN
Original Total Commitment:	USD 55.0M	Disbursed Amount:	USD 54.2M
Environmental Category: B			
Implementing Agencies: Water Authority of Jordan			
Cofinanciers and Other External Partners:			

B. Key Dates				
Process	Date	Process	Original Date	Revised / Actual Date(s)
Concept Review:	10/09/1996	Effectiveness:	04/12/1999	04/12/1999
Appraisal:	02/10/1998	Restructuring(s):		
Approval:	03/16/1999	Mid-term Review:		04/16/2002
		Closing:	01/31/2004	12/31/2006

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

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

C.3 Quality at Entry and Implementation Performance Indicators			
Implementation Performance	Indicators	QAG Assessments (if any)	Rating
Potential Problem Project	No	Quality at Entry	None

at any time (Yes/No):		(QEA):	
Problem Project at any time (Yes/No):	No	Quality of Supervision (QSA):	None
DO rating before Closing/Inactive status:	Satisfactory		

D. Sector and Theme Codes

	Original	Actual
Sector Code (as % of total Bank financing)		
Central government administration	10	4
Sewerage	45	48
Water supply	45	48
Theme Code (Primary/Secondary)		
Other financial and private sector development	Primary	Primary
Other urban development	Primary	Secondary
Pollution management and environmental health	Primary	Primary
Rural services and infrastructure	Primary	Not Applicable
Water resource management	Primary	Not Applicable

E. Bank Staff

Positions	At ICR	At Approval
Vice President:	Daniela Gressani	Kemal Dervis
Country Director:	Joseph P. Saba	Inder K. Sud
Sector Manager:	Narasimham Vijay Jagannathan	Jean-Claude Villiard
Project Team Leader:	Suhail J. S. Jme'An	Jamal Saghir
ICR Team Leader:	Sana Kh.H. Agha Al Nimer	
ICR Primary Author:	Klas B. Ringskog	

F. Results Framework Analysis

Project Development Objectives (from Project Appraisal Document)

Improve efficiency, management, operation and delivery of water and wastewater services for the Amman Service Area and lay the groundwork for sustainable involvement of the private sector in the country's overall management of water and wastewater services.

Revised Project Development Objectives (as approved by original approving authority)

(a) PDO Indicator(s)

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Indicator 1 :	Reduce unaccounted-for-water by 15 percentage points (as revised during MTR)			
Value quantitative or Qualitative)	54%	29% (adjusted)	40%	42%
Date achieved	05/18/1999	01/31/2006	01/31/2006	12/31/2006
Comments (incl. % achievement)	See Table 3 of report			
Indicator 2 :	Increase consistency of water supply in peak season			
Value quantitative or Qualitative)	One 8-hour period once a week-peak season	LEMA to submit a rationing plan semi-annually (and adhere to it). Additional requirements to be defined (revised).		Constancy increased to 46 hours per week during peak season and 72 hours per week during off-peak season
Date achieved	05/18/1999	01/31/2006		12/31/2006
Comments (incl. % achievement)	See Table 3 of report			

(b) Intermediate Outcome Indicator(s)

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Indicator 1 :	Reduce staff to a target of 4.0-4.5 employees per 1,000 water and sewer connections			
Value (quantitative or Qualitative)	5.6 staff per 1,000	4.5 employees per 1,000 connections		3.4 staff per 1,000
Date achieved	05/18/1999	01/31/2006		12/31/2006
Comments (incl. % achievement)	See Table 3 of report			
Indicator 2 :	Develop and implement Energy Management Plan to a target reduction of 18% of electrical consumption			
Value (quantitative or Qualitative)	Not available	LEMA to submit an updated Energy Plan by 01/30/04		Energy Plan submitted

		(revised)		
Date achieved	05/18/1999	01/31/2006		12/31/2006
Comments (incl. % achievement)	See Table 3 of report			
Indicator 3 :	Replace 150,000 water meters with new or rehabilitated water meters (revised from 200,000)			
Value (quantitative or Qualitative)	Not applicable	30,000 (domestic meter management policy); cumulative 150,000		250,000 meters repaired and replaced
Date achieved	05/18/1999	01/31/2006		12/31/2006
Comments (incl. % achievement)	See Table 3 of report			
Indicator 4 :	Reduce the number of breakdown repairs by a target reduction of 80% of the water facilities, and 50% of the sewer facilities.			
Value (quantitative or Qualitative)	Not available		Revised breaks per km of network	Number of pipe breaks repaired in the water network decreased from 4.2 per km in 2002 to 2.0 per km in 2005.
Date achieved	05/18/1999		01/31/2006	12/31/2006
Comments (incl. % achievement)	See Table 3 of report			
Indicator 5 :	Reduce the response time for water and sewer facilities repairs to a target average of 6 hours			
Value (quantitative or Qualitative)	Not available	Water: 6 hours Wastewater: 6 hours		Water and wastewater: 1.6 hours
Date achieved	05/18/1999	01/31/2006		12/31/2006
Comments (incl. % achievement)	See Table 3 of report			
Indicator 6 :	Map 100% of the water and sewer network			
Value (quantitative or Qualitative)	Not available	Map 100% of the water and sewer network.		100% of networks mapped using G15
Date achieved	05/18/1999	01/31/2006		12/31/2006
Comments (incl. % achievement)	See Table 3 of report			
Indicator 7 :	Develop and implement a Preventive Maintenance Program			
Value	Not available	LEMA to submit		Completed

(quantitative or Qualitative)		and implement an annual preventive maintenance plan. Compliance with the plan should be higher than 95%.		
Date achieved	05/18/1999	01/31/2006		12/31/2006
Comments (incl. % achievement)	See Table 3 of report			
Indicator 8 :	Improve the efficiency of bill collection by reducing accounts receivables (reduce to % of billed revenue).			
Value (quantitative or Qualitative)	Not available	Reduce to 20%. Revised: threshold of 100% and 95% collection efficiency (defined as annual collection divided by annual billing) have been agreed upon).		Accounts receivable decreased by 20%
Date achieved	05/18/1999	12/31/2006		12/31/2006
Comments (incl. % achievement)	See Table 3 of report			

G. Ratings of Project Performance in ISRs

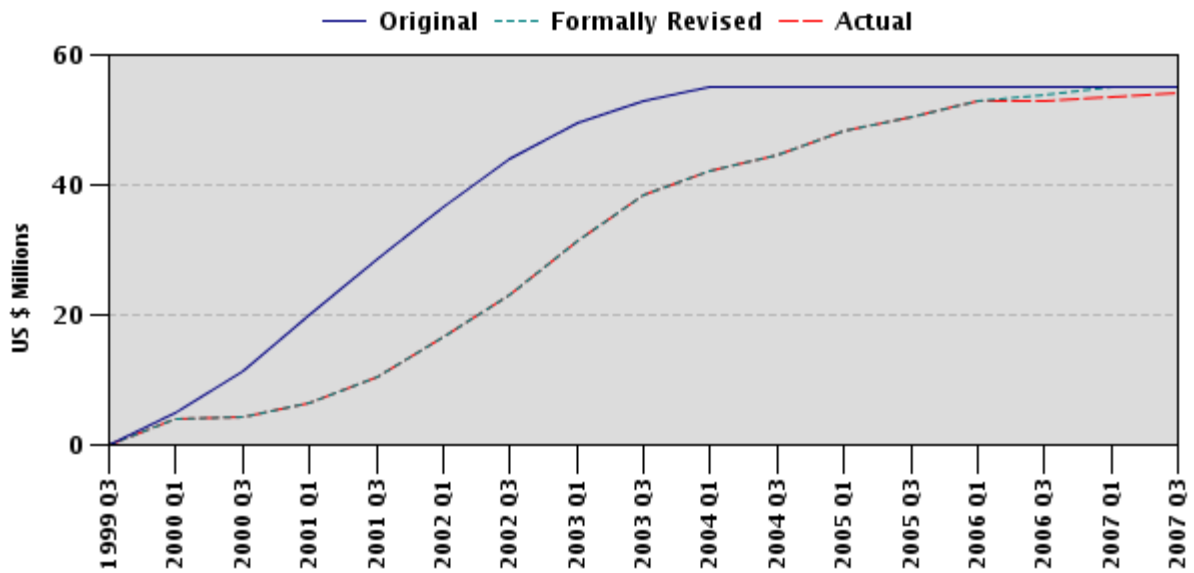
No.	Date ISR Archived	DO	IP	Actual Disbursements (USD millions)
1	05/18/1999	Satisfactory	Satisfactory	0.00
2	09/15/1999	Satisfactory	Satisfactory	4.01
3	03/13/2000	Satisfactory	Satisfactory	4.42
4	09/12/2000	Satisfactory	Satisfactory	6.41
5	02/21/2001	Satisfactory	Satisfactory	8.44
6	08/14/2001	Satisfactory	Satisfactory	15.26
7	12/14/2001	Satisfactory	Satisfactory	18.10
8	05/16/2002	Satisfactory	Satisfactory	24.65
9	12/10/2002	Satisfactory	Satisfactory	33.90
10	04/15/2003	Satisfactory	Satisfactory	39.10
11	10/01/2003	Satisfactory	Satisfactory	42.22
12	03/31/2004	Satisfactory	Satisfactory	44.67
13	08/22/2004	Satisfactory	Satisfactory	47.90
14	03/31/2005	Satisfactory	Satisfactory	50.40

15	11/15/2005	Satisfactory	Satisfactory	52.77
16	06/26/2006	Moderately Satisfactory	Satisfactory	52.77
17	12/13/2006	Satisfactory	Satisfactory	53.60

H. Restructuring (if any)

Not Applicable

I. Disbursement Profile



1. Project Context, Development Objectives and Design

1.1 Context at Appraisal

Jordan is one of the most water-short countries in the world. Only about 6 percent of the land is arable, and although the contribution from agriculture to GDP had declined to 3.3 percent in 2000, the agriculture sector still used two thirds of Jordan's water. About two thirds of the population is urban and both coverage and continuity of water supplies have been deficient. The water supply scarcity in the capital city of Amman is particularly acute, since the population mainly relies on water that has to be pumped from near the Dead Sea up to Amman, a vertical pumping of 1200 m, which makes for an energy-intensive and costly supply. Marginal volumes of water are supplied either from desalted water or from over-exploitation of groundwater, attesting to the water cost in environmental and financial terms. The next major supply source for Amman is the proposed Disi-Amman conveyor scheme that will mine fossil groundwater in the south of the country, and then pump it a distance of about 300 km to Amman, at yet higher costs. The implementation of the Disi-Amman conveyor scheme has been much delayed.

In 1999, the cost of supplying water to Amman was escalating rapidly, and the Amman Water and Sanitation Management Project (AWSMP) was designed to assist the Government of Jordan in using water more efficiently by reducing the excessive share of unaccounted-for-water and improving the overall operation and maintenance of the system. AWSMP responds to three of the five priorities of the World Bank's 2002 Country Assistance Strategy, as follows: (a) enhancing conditions for growth led by the private sector; (b) addressing resource conservation, exploitation, and management with a focus on water scarcity; and (c) improving governance through public sector reform.

In addressing these issues, the AWSMP was designed to:

- (a) Pioneer private sector participation in the Jordanian water sector through a performance-based management contract aimed at improving the overall efficiency of water supply and sanitation system in Amman. This would be measured against achievement of over 40 key performance indicators. Moreover, the management contract designed by this project was also amongst the first supported by the World Bank and hence did not have much case history to learn from.
- (b) Take steps to address the urgent need to manage the scarce water resources available to meet the needs of the population, as well as public and industrial establishments in Amman. It is important to note that addressing resource augmentation, conservation and allocation issues were outside the scope of the project.
- (c) Initiate reform in the sector by letting out Amman's water supply and sanitation system under a competitively-procured management contract, which would be independently monitored. This was a clear departure from the previous World Bank strategy under which eight World Bank loans had been made to the water supply and sanitation sector with public sector operators, but which did not result in significant improvements to water supply and sanitation (WSS) services. On the contrary, service levels had continued to decline in the 10 years preceding the AWSMP project.

The World Bank was in a position to play a central role in assembling the co-financiers for AWSMP, namely the European Investment Bank, Italian bilateral assistance, KfW, and USAID.

1.2 Original Project Development Objectives (PDO) and Key Indicators

The PDO was to: (i) improve efficiency, management, operation and delivery of water and wastewater services for the Amman Service Area; and (ii) lay the groundwork for sustainable involvement of the private sector in the country's overall management of water and wastewater services.

Key performance indicators to monitor project implementation were extracted from the management contract performance indicators and included the successful prioritization of sector investments, improved efficiency of water distribution, improved continuity of supply, improved management, rehabilitation, and efficiency of water management, as well as strengthened capacity and financial viability of the Water Authority of Jordan (WAJ).

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

Project development objectives were not revised.

A number of the management contract performance indicators were adjusted during implementation through a series of memorandum of understanding between WAJ and the private management contract operator – a joint venture between *Suez Lyonnaise des Eaux-Montgomery Watson Arabtech Jardaneh* (LEMA). The adjustments were necessary to accommodate exogenous factors that affected contract performance with LEMA, and to make the indicators more realistic. For instance, the original expectation of reducing unaccounted-for-water of 54% to 29% by the fourth project year was changed in 2002 to a final target of 45%. However, the key performance indicators listed in the PAD were never formally revised to reflect the adjustment to the contracted performance indicators in the management contract.

1.4 Main Beneficiaries

Amman's total population, estimated at 2.0 million, was expected to benefit from the improved distribution system which would (i) increase the reliability of water supply, (ii) improve the quality of the distributed water (through more reliable disinfection), and (iii) enable more equitable access through the use of more rational criteria for allocating scarce water.

Between 2003 and 2007, the influx of over 500,000 Iraqi refugees swelled the Amman population by an estimated 25% and commensurately increased the number of beneficiaries from the project. Providing service to this unanticipated population increase added to LEMA's challenge particularly when bulk supplies to Amman remained largely unchanged.

1.5 Original Components (as approved)

The project financed four components as detailed in Table 1 below:

Table 1: Original Project Component Costs (in US\$ million)

Component	Cost including contingencies	Bank financing
1. Management contract	10.03	10.03
2. Operating Investment Fund (OIF)	24.11	24.11
3. Capital Investment Program (CIP)	94.69	15.36
4. Technical assistance	7.17	5.50
Total	136.00	55.00

Component 1 financed the competitively bid fixed fee charged by the private operator mainly covering the personnel and overhead, while *Component 2* supported short-term expenditures to improve operations and maintenance in the Service Area that were not covered by the company's working capital. *Component 3* supported design, implementation, and supervision of a slice of the restructuring and rehabilitation of the water supply system, as well as upgrading and extending service coverage. *Component 4* supported consultant services for supervision and for project management under the Project Implementation Unit (PIU). Component 4 was also intended to finance other studies in the water sector throughout Jordan.

1.6 Revised Components

There were no revisions of the approved components. However, there were some changes in the final allocation of the loan between the project components (see Table 2 below) for two main reasons:

(i) The private operator contract was extended for 41 months to cover the period of the closing date extension, hence expenditures under Component 1 was increased by 66%. The rationale for the extension is explained below, and

(ii) Other financing was made available for the Operating Investment Fund from improved internal cash generation from operations, and to a lesser extent through a debt swap arrangement with the French government, hence expenditures under Component 4 were decreased by 65%.

1.7 Other significant changes

There were no significant changes in project scope and implementation arrangements except that the loan closed 41 months after the original closing date on account of two extensions: the first extension of 17 months was justified by the slower-than-expected implementation of the Capital Improvement Program (CIP), particularly those sections financed with Italian funding. The second extension was justified by the need to prepare for the next investment phase and to define and prepare for the institutional setup that would be in place after LEMA completed its contract by the end of the project period. The increase in CIP was approved on an emergency project called the Khaw-Batravi pipeline to increase the supply to Amman to alleviate the increasing shortage

Table 2 below compares the final against the originally estimated project costs for the Bank-financed components:

Table 2: Actual Project Component Costs as of January 30, 2007 (in US\$ million)

Component	Original Bank financing	Final Bank financing	Final as a percent of original Bank financing, %
1. Management contract	10.0	16.6	166%
2. Operating Investment Fund	24.1	13.1	54%
3. Capital investment Program	15.4	22.6	147%
4. Technical assistance	5.5	1.9	35%
Total	55.0	54.2	99%

2. Key Factors Affecting Implementation and Outcomes

2.1 Project Preparation, Design and Quality at Entry

A major factor that influenced project design was the lesson learnt from eight previous Bank-funded water supply projects to Jordan that public sector management of the Amman water supply system had failed to produce improvements in service levels. To overcome the weak governance structure associated with public sector management the AWSMP chose to apply the discipline of contractual obligations to improve service levels by employing a private operator, chosen competitively from among pre-qualified internationally-experienced operators.

A second key factor was the lesson learnt that while tariffs had to reflect water scarcity and operational costs, any tariff adjustment should be made prior to the private operator taking over so as to avoid a political backlash against the private operator which would make it difficult for him to bill and collect for services, albeit on behalf of his employer, the Water Authority of Jordan (WAJ). A tariff increase was accordingly approved in 1997, well in advance of inviting the private operators to pre-qualify and bid.

The third key factor affecting design was the need for the private operator to retain a sizeable number of WAJ staff, both to retain the continuity of experienced staff, as well as to mitigate the alternative employment issues at the WAJ, since the staff released by the private operator were sent back to WAJ to find alternative tasks there. The private operator was committed to retaining at least half of the WAJ employees in the Amman Service Area.

The successful incorporation of these factors in the project design helped to ensure good quality at entry for this project.

2.2 Implementation

The project was implemented under a management contract with the private operator, LEMA. The initial four year management contract from August 1, 1999 to July 31, 2003 was extended twice, (by 17 and 24 months respectively) to correspond with the extensions of the project Closing dates and ended on December 31, 2006.

There were no significant factors affecting implementation and outcomes. At no time was the project at risk; neither were there any major restructuring of the project.

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

The monitoring of the implementation of the Capital Investment Program (CIP) and of the performance of the private operator was undertaken by the Planning and Management Unit (PMU), which started as part of WAJ and subsequently moved to the Ministry of Water and Irrigation (MWI) and served as a de jure regulator. The PMU was funded by a grant from the EU. The PMU's function was to track progress towards meeting the Project objective of improving efficiency, management, operation and delivery of water and wastewater services. Specific target values were adopted for 15 key indicators, and these were tracked on a quarterly and annual basis. The key indicators were drawn from the more comprehensive performance indicator agreement for the management contract. In addition, an annual monitoring report was prepared by outside technical and financial auditors, funded by the USAID.

2.4 Safeguard and Fiduciary Compliance

The PMU was responsible for ensuring safeguard and fiduciary compliance. No Bank safeguards were triggered.

2.5 Post-completion Operation/Next Phase

For the post-completion phase, USAID funded a study to determine management options. The study was done in three stages as follows:

(i) In the first stage, alternative organizational models for the Amman water supply and wastewater system were evaluated in a study concluded in January 2006. On the basis of the study, the MWI and WAJ decided to establish a new company, along the lines of the successful Aqaba Water Company, to provide water supply and wastewater services in the LEMA service area, as well as in the Amman Governorate. This new company would be established under company law as a company owned 100% by the government. This would allow the new company certain flexibility with respect to hiring and firing of staff, determining its own pay-scale and stepping out from the rigidities of the civil service rules and regulations. The new company would not be subjected to public procurement rules and regulations.

(ii) On the second stage a feasibility study was carried out to establish and make this new company operational. This study was concluded in July 2006.

(iii) The third ongoing stage is detailing the implementation arrangements and transfer of over seven years of management experience from LEMA to this new company, which is now called Jordan Water Company (*Miyahuna* in Arabic). Four of LEMA's key staff have been employed for a period of six months to oversee the transition arrangements.

3. Assessment of Outcomes

USAID will also finance four advisors for up to one year each to support the *Miyahuna* management. *Miyahuna's* General Manager had, until his appointment, headed up the Aqaba Water Company (AWC), the corporate structure of which *Miyahuna* resembles. With this experience, it is anticipated that the transition to the post-project period will be a smooth one.

3.1 Relevance of Objectives, Design and Implementation

The ICR rates the relevance of the project as high as the project objectives respond to three of the five priorities of the Country Assistance Strategy (see Section 1.1 above). The design and implementation of the project is closely aligned to these objectives in terms of the close and continuous involvement of the private sector, both for operating and maintaining the water supply and wastewater system and for monitoring project results.

3.2 Achievement of Project Development Objectives

The achievement of the PDO can be measured in two related ways: (i) by comparing the actual values of the key performance indicators to the target values at appraisal; and (ii) by assessing the efficacy of the four components in terms of their respective output. The first comparison of performance indicators, grouped around three major outputs is shown in Table 3 below:

Based on (i) the high degree of compliance with targets and on the satisfactory implementation of the four main components (as detailed in Annex 2) related to improvements in the operations and delivery of services; and (ii) on the fact that project pioneered successfully private operations of water supply and wastewater systems in Jordan. However the government decision to revert back to the private sector may compromise the long term sustainability of project achievements *the ICR rates the achievement of project development objectives of the project as “moderately satisfactory”*.

Table 3: Comparison of Target and Actual Values of Key Performance Indicators

<i>Outcomes , Key Performance Indicators and Targets</i>	<i>Status and Final Achievement</i>
1. Improved management of water and sanitation services in the Service Area	
<ul style="list-style-type: none">Unaccounted-for-water reduced by 25 percentage points from 54% in 1999 to 29% in 2004 (the latter target was revised to 45%, to be achieved by 2006).	On average, the reduction achieved was from 54% to 42% in 2006. However, the reductions in unaccounted for water achieved are much more dramatic (amounting to 35%), in 150 out of 310 districts, where the network and metering have been upgraded. Furthermore, in 30 selected districts where continuous water supply was achieved on pilot basis, losses were reduced to an average of 23%.

<i>Outcomes , Key Performance Indicators and Targets</i>	<i>Status and Final Achievement</i>
<ul style="list-style-type: none"> • Constancy of water service to be increased: (i) from one 8-hour period once a week in peak season to 36 hours in peak season and 48 hours in off-peak season in the first year and thereafter continuous in off-peak season. 	<p>Despite of influx of large number of Iraqi refugees and the negligible increase in bulk supplies in Amman:</p> <ul style="list-style-type: none"> (i) Constancy increased to 46 hours per week during the peak season, (ii) Constancy increased to 72 hours per week during off-peak. <p>These were achieved through improved efficiency of operation and an effective rationing plan. Further improvements are contingent on increases in bulk water supplies and the ability to isolate hydraulically smaller distribution districts to control pressure and supplies.</p>
<ul style="list-style-type: none"> • Operating and maintenance procedures prepared to international standards. 	Modern utility O&M procedures to international standards were prepared and fully implemented
<ul style="list-style-type: none"> • Staff productivity to be improved from 5.6 to 4.0 staff per thousand water and wastewater connections. 	Staff productivity improved from 5.6 to 3.4 staff per thousand water accounts.
<ul style="list-style-type: none"> • An Energy Management Plan (EMP) developed and implemented and power consumption reduced by 18% by 2004. 	EMP was submitted by the stipulated deadline but permanent power consumption reduction cannot be meaningfully measured as long as there is significant rationing of supplies.
<ul style="list-style-type: none"> • A customer service and public information program developed and implemented. 	A state-of-the-art computerized customer call center (CCCC) was established and is successfully operated. Annual customer surveys are also conducted.
2. Rehabilitation of the Amman water network and improved distribution efficiency	
<ul style="list-style-type: none"> • 200,000 water meters repaired and replaced. 	250,000 meters were renewed.
<ul style="list-style-type: none"> • Number of breakdown repairs in the water network reduced by 80% and in the wastewater network by 50%. 	The definition of this indicator was fine-tuned in a later Memorandum of Understanding to measure breaks per km of pipe. The number of pipe breaks repaired in the water network decreased from 4.2 per km in 2002 to 2.0 in 2005, a reduction of 52%. LEMA exceeded the annual length of sewers cleaned under the preventive maintenance program by about 40%.
<ul style="list-style-type: none"> • Response time for repairs of water and sewerage malfunctions reduced to 6 hours. 	Water network repair time reduced to 1.6 hours.
<ul style="list-style-type: none"> • 100% of network mapped. 	100% of the network was mapped using GIS.
<ul style="list-style-type: none"> • A hydraulic computer model developed and staff trained in its use. 	Model was successfully developed and staff were trained in its use
<ul style="list-style-type: none"> • A preventive maintenance program implemented. 	Completed.
<ul style="list-style-type: none"> • A leak detection and repair program implemented. 	Completed. An active GIS-based leak detection program responds to detected leaks within 5.7 hours.
3. WAJ capability and financial viability strengthened	

<i>Outcomes , Key Performance Indicators and Targets</i>	<i>Status and Final Achievement</i>
<ul style="list-style-type: none"> Collection of Accounts receivable improved to 20% of annual billings, equivalent to 73 days of average daily billings by end of project period 2004. New performance targets on a rolling basis were introduced at the recommendation of the auditor in 2002 in order to avoid the distortion caused by excessive levels of uncollectible accounts receivable prior to the management contract. 	<p>Accounts receivable (in terms of days of average daily billing) decreased by 20% from 269 days in 1999 to 217 days in 2005. The reduction to the targeted 73 days was not achieved due to a number of excessively old accounts receivable that are difficult to collect (Jordanian law prohibits accounts receivable of about 70 days of average billings to be written off even though the likelihood of ever collecting them is remote). In the case of Amman, old account receivable inherited from 1985 account for about 70 days of average billing. The introduction of a new commercial system, X7, required more time than originally expected, and further explains the slow reduction in accounts receivable. Subsequently LEMA was able to comply with the modified, rolling targets of collection of accounts receivable from 2003 onwards.</p>
<ul style="list-style-type: none"> A computerized information system for subscribers, billings and collections, accounts receivable, accounting, maintenance management and inventory systems developed and maintained. 	<p>The system was successfully developed and remains operational. The commercial system makes use of GIS in order to identify the location of the client base more accurately and is used for planning purposes.</p>

In summary, the management contractor LEMA was able to comply substantially with 12 of 15 performance targets listed in Table 3 above and did reduce both the percentage unaccounted-for-water and the accounts receivable as measured by the days of average billings. Furthermore LEMA was able to achieve a performance incentive payment, which is tied to the achievement of its contracted obligation, for every year of its operations. It can be argued that it was unlikely in the first place to expect a reduction of the level of unaccounted-for-water by 25 percentage points particularly where water supply is intermittent and in the level of accounts receivable from 269 days to 73 days within the relatively short time period of four years. This is why the targeted reduction of unaccounted-for-water was modified and refined in 2002 to acknowledge the fact that the baseline indicators had been set on the basis of unreliable estimates.

The achievement in terms of the remaining performance indicators of reducing the number of water and sewerage network repairs is partial. It is likely that repairs in the short-and medium-term will increase with improving operations (i) through improved constancy of water service (when significant additional bulk water supply from the Zara- Ma'in and Disi are available); and (ii) in a situation where improved customer service and public information campaigns encourage customers to report leaks and malfunctions. Much of the network repairs are due to the old deteriorated secondary and tertiary networks within the remaining 160 un-rehabilitated distribution districts. Rehabilitation and replacement of the network within those two outside the scope of the project and would require further investment of about US30-40 million.

3.3 Efficiency

The efficiency in terms of economic rate of return on project investments cannot be fully calculated as implementation delays have resulted in 13 of the 15 CIP contracts having been finalized and 150 out of the 310 distribution districts having been hydraulically isolated as of the project completion date. The full benefits of the higher efficiency expected from the project will not be realized until the CIP is completed and at such time that all the 310 District Zones will have been hydraulically contained and bulk-water supplies will have increased sufficiently to make continuous service possible. However, Annex 3 shows the partial cost-benefit analysis of the expected improvements in the continued reduction of the non-revenue water (analogous to the unaccounted-for-water) which estimates the economic internal rate of return as 33%, attesting to the high economic returns on reducing losses in an arid area where there is a high value on saving scarce and costly water. *Based on the rate of return the ICR rates the efficiency of the project as high.*

3.4 Justification of Overall Outcome Rating

In view of the high relevance of the project, the partial achievement of project development objectives and the successful piloting of new Public-Private Partnership arrangements during 7.5 years despite severe limitations in bulk water supply, *the ICR rates the overall outcome as moderately satisfactory.*

3.5 Overarching Themes, Other Outcomes and Impacts

Not applicable.

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

The lower-income strata in Amman have benefited from the project in three ways:

First, the poor are the last among the population to be connected to the water supply and sewerage networks. Water connections under the AWSMP rose from about 90% in the year 2000 to practically 100% in 2005. This implies that the poor are now in a position of parity with their richer neighbors in terms of equality of access to this basic resource.

Second, the poor have similarly benefited from the rise in the sewer share of the population from 69% in 2000 to 80% in 2005.

Third, where service is deficient, either through intermittent supplies or through unsafe water quality, the poor suffer disproportionately because they have less economic means to pay for alternative supplies. By the same token, where constancy of supply and the quality of water improve the poor benefit.

(b) Institutional Change/Strengthening

The project did achieve the first PDO (“improved efficiency, management, operation and delivery of water and wastewater services for the Amman Service Area”). It did this through improving the capacity and financial viability of the Water Authority of Jordan (WAJ) since

LEMA managed to substantially improve collections and working capital during the contract period.

The project also aimed to “lay the groundwork for sustainable involvement of the private sector in the country’s overall management of water and wastewater services”. It succeeded in working with a private operator (LEMA), which gained experience in the seven and a half years of the project period to successfully operate and maintain improvements in the Amman water supply and wastewater systems. In this period, the practice of modern utility management was introduced, and the accountability of the operator was established.

Beyond laying this ‘groundwork’, the project helped manage the transition from LEMA to a new company, the Jordan Water Company, *Miyahuna which operates on commercial basis with more transparent governance structure*, thus ensuring that management of the Greater Amman water and wastewater systems did not revert back to WAJ. The reversal from a path towards greater private sector participation is explained by the inability of the government to guarantee bulk water supply because of the continued scarcity of water resources in Jordan.

After some six years of a private management contract the Government faced the choice of either extending the LEMA management contract, or replacing it by something else. The first option would have been pointless unless the Government had been able to shift more risk to LEMA by requiring it to reduce non-revenue water and by demanding that the constancy of water service be increased to 24-hours. Both obligations would have required WAJ to guarantee annual and growing supplies of raw water to LEMA for distribution. However, without any guarantee that more bulk water would be available, WAJ was unable to contractually commit to LEMA increasing water quantities. Under the circumstances the Government opted not to try to shift more risk to LEMA, since LEMA would simply have refused to commit to greater constancy of water supplied and lower non-revenue water. The government concluded that the LEMA management contract offered no potential for further improvements.

Instead, the Government had the example of the Aqaba Water Company, an independent public company, which was operating efficiently. The government then chose to adapt the Aqaba model to Amman since it offered the possibility (albeit a risky one) of greater efficiency with a more flexible path towards continuous service. *Miyahuna* was set up as an independent public company, operating under the commercial company law. Its start-up has been facilitated by the deployment of key senior staff from LEMA to assist the *Miyahuna* management for a six-month period (see also section 2.5 above).

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

The project successfully promoted the use of a Geographical Information System (GIS) to record and manage water supply and wastewater assets; and this system has now been adopted by other public agencies to help their work. Another positive impact arose from the successful establishment of two meter repairs shops which have proved successful, and is planned to be developed into an independent profit center to serve regional demand outside the Amman service area. The government is also developing a water resource strategy to develop more sustainable policies to better manage the supply risks.

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

LEMA initiated annual surveys of stakeholder satisfaction and a more meaningful engagement with its customers. The survey was carried out by private company throughout the service area, with an emphasis on the areas that has benefited from the CIP. The results of the survey indicate that the customer satisfaction improved over the project period, specifically with regards to water quality, quantity of water supplied, and customer service. These achievements are expected to be maintained and further improved upon by *Miyahuna*.

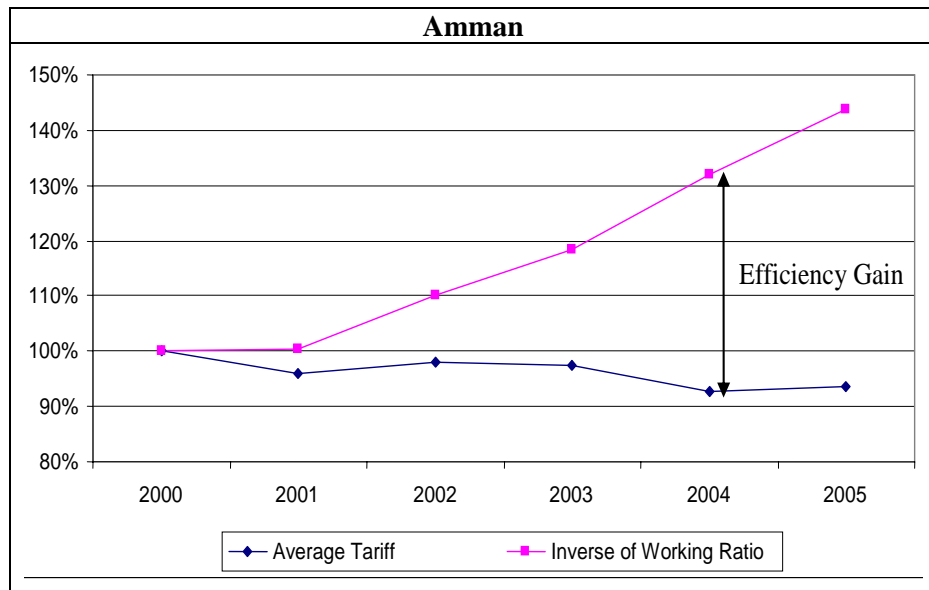
4. Assessment of Risk to Development Outcome

The “Risk to Development Outcome” is rated as Moderate, based on the following considerations:

- Technical risks are moderate in the medium term because the AWSMP has implemented ten contracts to improve technical capacity for operating and maintaining the existing larger water supply facilities; another five contracts are under implementation.
- Bulk water supply to Amman has recently been augmented with 40 million m³ annually from the Zara Ma’een reverse osmosis plant, implying a net increase in supplies of about 25 percent.
- The efforts to reduce leakage in the water distribution network (though not as successful as expected, see Table 3) has improved the chances of further increasing the hours of supply in the *Miyahuna* service area; the production capacity is equivalent to about 160 l/c/d (assuming a total population in Amman of 2.3 million in 2006). Assuming a 35% leakage, this supply corresponds to an average consumption level of about 110 l/c/d, which could be sufficient for continuous supplies.
- In the medium term, work is needed to continue to confine Distribution Districts hydraulically and restore continuous service to already confined Zones where the network has been upgraded and where metering is universal. This upgrading of the distribution system will likely continue in order to reduce leakage in preparation of the expensive water from the Disi Conveyor system that is expected to be operational from 2012 onwards.
- The financial risks are moderate. Through the 1997 tariff increase as well as the improvements made possible under the management contract, the working ratio¹ dropped from about 110% in 2000 to below 80% in 2005. This constitutes a margin to ensure orderly operations and provide financing for further operational improvements. The graph below shows the inverse of the working ratio (cash operating income/cash operating costs) since the year 2000.
- The next investment phase, the Start-up Project, with about US\$75 million of investment to further improve the operational efficiency in the 2007-2012 period has already

¹ The financial working ratio is defined as the relation between cash operating costs (excluding depreciation) and cash collections.

received financing of about US\$17 million from KfW and another US\$4 million from USAID. Additional financing is expected, given the amount of good-will that Jordan commands with potential external financiers.



- The economic risks are rated as moderate as well. Jordan’s economy has been skillfully diversified and concessionary funding has been secured due to Jordan’s geopolitically sensitive location;
- The institutional risks are rated as substantial. However, the Government of Jordan has put in place a few measures to mitigate such risks. The new operating company, *Miyahuna*, has a charter that is similar to that of the Aqaba Water Company (AWC), which has been operating successfully for a few years. The general manager of AWC has now been appointed to head up *Miyahuna*. The new *Miyahuna* management will also be supported by a consulting firm financed by USAID. Furthermore *Miyahuna* agreed with LEMA that key senior staff of LEMA would continue to provide support to the new company management for 6 months;
- The socio-political risks are similarly rated as moderate, based on the successful risk mitigation that the Kingdom of Jordan has managed in the past.

5. Assessment of Bank and Borrower Performance

5.1 Bank Performance

(a) Bank Performance in Ensuring Quality at Entry

The project was prepared using a PHRD grant during 1997-1999 and utilized lessons from the preparation of the Gaza management contract (1995-96), but improved on the structure of the operating contract. Sufficient time for project preparation ensured client ownership and capacity building in favor of piloting private sector participation in the sector. During preparation, a competitive and transparent bidding process for the management contract was followed; it

attracted wide interest and enabled the pre-qualification of five internationally-experienced operators.

The processing of the loan was also carefully matched by measurable milestones, such as an increase in the water and wastewater tariff to make operations financially sustainable. Similarly, a substantial effort was made to line up and coordinate with other external financiers, agencies such as EIB, Government of Italy, KfW, and USAID, to ensure adequate financing of the Capital Investment Program.

Rating: The ICR rates the Bank performance during preparation as “Satisfactory”.

There was no assessment by the Quality Assessment Group of Quality at Entry.

(b) Quality of Supervision

The project was supervised by a Washington-based task team with excellent knowledge of the sector and the project and had a task team leader who was involved with the project from preparation through completion. The project supervision budget averaged US\$75,000 annually, which was adequate for a project that was never in problem status or at risk.

Rating: The ICR rates the Bank performance during supervision as “Satisfactory”.

(c) Justification of Rating for Overall Bank Performance

Rating: Based on the section 5.1 (a) and (b) the overall Bank performance as “Satisfactory”.

5.2 Borrower Performance

(a) Government Performance

The Government supported the process of employing a private operator and took the necessary steps to make the contract sustainable throughout project implementation in several ways:

First, it decided in May 1997 to restructure and raise tariffs in Amman prior to the arrival of the private management operator, LEMA. The early action on tariffs that became effective in October 1997 was helpful in minimizing the public’s perception that tariff increases were linked to the private operator.

Second, the procurement of the management operator was handled by a special Tendering Committee with representation from the Ministries of Public Works and Housing; Planning; and the Water Authority of Jordan. The Tendering Committee adopted the Bank procurement procedures, which helped the perception of a fair and transparent procurement which no doubt contributed to the relatively high number of expressions of interest for pre-qualification and bids.

Third, the Government adopted a Water Utility Policy in advance of the tendering which was a way to mitigate political risk for the bidders.

Fourth, the Government appointed a special Project Development Team to guide the transition from the LEMA contract to its successor, the *Miyahuna*. There is a clear need for assistance during the transition since LEMA could rely on the technical know-how of its parents, *Lyonnaise des Eaux and Montgomery Watson* whereas *Miyahuna* does not have a corresponding resource to draw on.

Rating: The ICR rates the performance of the Government as “Moderately Satisfactory”.

(b) Implementing Agency or Agencies Performance

Rating: The implementing agency of the Project is the PMU. WAJ exercised its overview of project implementation through the PMU. The PMU managed the Capital Investment Program and supervised LEMA’s management contract. The ICR rates the performance of PMU during supervision as “Satisfactory”.

(c) Justification of Rating for Overall Borrower Performance

Rating: *The ICR rates the performance of the Government as moderately satisfactory and of the implementing agency as “satisfactory”.*

6. Lessons Learned

The project-specific lesson learned was the lack of interest of the contractor to take advantage of the performance based management fee. The award criterion for the bids for the management contract comprised two parts: one annual fixed management fee and one performance-based fee called, the Performance Incentive Compensation (PIC). Bidders were asked to indicate the amount of fixed management fee and the PIC, which in turn was expressed as a percentage of the incremental improvement of the cash flow of the Amman operation.

LEMA presented the winning bid with the lowest required combined remuneration. However, interestingly, LEMA bid the minimum percentage (5%) that served to calculate the annual PIC. As a result, the PIC has represented only about 5% of the total compensation paid to LEMA. For instance, over the four year period 2001-04 LEMA was paid an average PIC of US\$ 0.2 million or between 5% and 10% of what it received as the fixed annual management fee. The structure of the bids demonstrated that bidders were risk-averse and preferred to rely on the fixed fee. This is an important lesson for the design of management contracts.

Generally applicable lessons learned were as follows:

At the design stage

- Risk allocation between the contract parties has to be laid out with as much detail as possible. This would help the private sector price their risk and the MC would have benefited. In the Amman MC the concept of a simple management contract attempted to approach a lease contract or affermage too much which in turn increased the risks, the uncertainty for the bidders and the price of the bids.

- The availability of accurate baseline data is crucial for assessing the performance of the operator and the importance of such a baseline cannot be emphasized enough.
- Excluding the operator from managing the capital investment component had a negative impact (through delays) on achieving certain performance targets. The operator should have had more of a say as where new major investment were going.
- When the existing utility operations are relatively weak performance targets should be conservative and should be limited to a handful of the truly central ones. The Operator should be given more hand in proposing innovative ways to manage and operate the system instead of focusing their energy on monitoring a large number of performance indicators.
- When the private operator is entering a relatively weak environment, the duration of the MC should be six years and upwards since this is the minimum time to achieve significant improvements in such a weak environment.

During the implementation stage

- The effort and time required to reduce unaccounted-for-water/non-revenue water was underestimated. Compared to the forecast reduction of unaccounted-for-water of 25 percentage points for a four-year management contract the reduction has been about 9 percentage points for a management contract that lasted 7.5 years. The experience highlights the importance of not over-promising improvements, particularly for complex issues such as UFW under intermittent supply because such promises weaken the political support in favor of credibly performing private contractors.
- Allowing the prospective bidders to bid on the percentage of the incentive fee was sub-optimal and created more risks to the bidders.
- The credibility of the water supply operations depends on the success in achieving continuous water service in Amman. It is now clear that this will require more time than forecast. The question remains at what per capita supply it would be possible to provide continuous service. At the present time, the available per capita supply of 160 l/c/d could be sufficient. However, it should be of general interest to document how continuous service is achieved in Amman. The Jordan Water Company, *Miyahuna*, and WAJ might consider preparing to document the measures taken to this effect and their success for the benefit of other Jordanian cities and other countries.

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

(a) Borrower/implementing agencies

In addition to its “Implementation Completion Report” for which summary is presented in Annex 7, the Borrower commented on the Bank’s draft ICR. The Borrower considered the Amman Water management contract satisfactory and that it achieved its development objectives. In addition they noted that searching for a private sector partner was the duty of the successor of the management contract. The government believes that the current setup of *Miyahuna* is not final until their efforts to find a private sector partner is finalized.

(b) Cofinanciers

For the co-financed components the implementation is still ongoing. Therefore implementation completion is not sought.

(c) Other partners and stakeholders
(e.g. NGOs/private sector/civil society)

Annex 1. Project Costs and Financing

(a) Project Cost of Bank Loan Components (in USD Million equivalent)

Components	Appraisal Estimate (USD millions)	Actual/Latest Estimate (USD millions)	Percentage of Appraisal
MANAGEMENT CONTRACT (MC) OPERATOR'S BASE FEE	10.03	16.63	166
OPERATING INVESTMENT FUND	24.11	13.10	54
CAPITAL INVESTMENT	15.36	22.60	147
TECHNICAL ASSISTANCE	5.50	1.90	35
UNALLOCATED FROM SAVINGS IN THE MC BID	0.00	0.00	
Total Baseline Cost	55.00	54.23	99
Physical Contingencies	0.00	0.00	0.00
Price Contingencies	0.00	0.00	0.00
Total Project Costs	55.00	54.23	
Project Preparation Fund	0.00	0.00	.00
Front-end fee IBRD	0.00	0.00	.00
Total Financing Required	55.00	54.23	99

(b) Financing

Source of Funds	Appraisal Estimate (USD millions)	Actual/Latest Estimate (USD millions)	Percentage of Appraisal
EC: European Investment Bank	44.00	NA	NA
ITALY, Govt. of (Except for Dev. Coop. Dept. - MOFA)	20.00	NA	NA
International Bank for Reconstruction and Development	55.00	54.23	99
FOREIGN SOURCES (UNIDENTIFIED)	0.00	0.00	.00

Annex 2. Outputs by Component

The efficacy, or achievement of the four project components, is rated *satisfactory* based on the comparison between the appraised scope and realized scope:

Component	Appraised scope	Realized scope	Efficacy of Component
Performance-based management contract (MC)	48 months of competitively procured world-class private operator	89 months of competitively procured world class private operator	<i>Satisfactory</i>
Operating Investment Fund (OIF)	US\$ 24.1 million	US\$ 13.1 million expended	<i>Satisfactory.</i> Improvement in collection increased internal cash flow, thus there was less need to rely on augmenting the working capital needs through the OIF.
Capital Investment Program (CIP)	US\$ 15.4 million to improve the water supply system. The CIP was co-financed by USAID, EIB, KfW, Government of Italy, and Government of Jordan	US\$ 22.6 million expended to convert the previously direct-pumping scheme to one where the distribution zones would be supplied by gravity within individual Distribution Zones	<i>Satisfactory.</i> The primary and secondary distribution systems have been converted from a directly pumped one to one fed by gravity from service reservoirs.
Institutional restructuring and strengthening of WAJ capacity	Strengthened WJ capability and financial viability	The WAJ capability has undoubtedly been strengthened but the Amman water supply and wastewater system remains dependent on concessionary national and foreign financing of its investments	<i>Moderately Satisfactory</i>
Total project			<i>Moderately Satisfactory</i>

Annex 3. Economic and Financial Analysis

One of the main objectives of the Amman Water and Sanitation Management Project is to reduce the excessive levels of unaccounted-for-water (UFW), related but not identical to non-revenue water (NRW). The two are not fully congruent as is shown in Graph 1 below. The Non-Revenue Water is simply the water that does not produce revenue for the utility. In contrast, the Unaccounted-for-Water is the share of water system input that is unknown in quantity and in use, such as water leaked in the distribution system (technical losses), water stolen (as in illegal connections), imperfectly recorded (as in under-registering meters or through collusion between meter readers and consumers), poorly estimated in the commercial system (administrative losses) and so on. The key characteristic of unaccounted-for-water is whether it is accurately metered which allows it to be accounted-for. The analogous key characteristic for non-revenue water is whether it produces revenue, and not whether it is metered and properly accounted for. In practice, NRW and UFW may be similar as a percentage. For instance, the accounted water excludes the billed unmetered consumption but does include the unbilled metered consumption. The revenue water handles these two items in the water balance in exactly the opposite way.

Graph 1: Water Balance of a Water Utility

System Input Volume (corrected for known errors)	Authorized Consumption	Billed Authorized Consumption	Billed Metered Consumption	Revenue Water
			Billed Unmetered Consumption	
		Unbilled Authorized Consumption	Unbilled Metered Consumption	Non Revenue Water
			Unbilled Unmetered Consumption	
	Water Losses	Commercial (<i>apparent</i>) Losses	Unauthorized Consumption	
			Customer Meter Inaccuracies and Data Handling Errors	
		Physical (<i>real</i>) Losses	Leakage on Transmission and Distribution Mains	
			Leakage and Overflows at Storage Tanks	
		Leakage on Service Connections up to point of Customer Meter		

In the case of Amman system the AWSMP concentrated on converting the distribution mode from having water directly pumped to consumers to one where water was pumped to service reservoirs from which water was fed by gravity to Distribution District (DD). The gravity supply offered a number of advantages such as easier operations and more even pressures. Once all the 15 contracts in the Capital Investment Program are completed water will then be distributed through the secondary distribution network to 310 DD. In order to properly monitor consumption in each DD it is necessary to confine each DD hydraulically in such a way that all inflows to a DD are metered. The confinement allows a comparison between the water supplied to each DD and the sum of all individual meter readings which will in turn enable the utility to accurately estimate the non-revenue water (NRW) or the unaccounted-for-water (UFW). Accurate estimates will allow appropriate measures to be taken to reduce NRW and UFW.

The hydraulic confinement has only been completed for about 150 of the 310 Distribution District in Amman. The work to confine a DD is painstaking since all unknown connecting pipes to adjacent DD have to be closed off through valves or through removal. Over many decades ad hoc pipe sections have been constructed, by the utility or by consumers, in order to improve water service. Many of these are unregistered by the utility (which is why the complete mapping of the network was included under the AWSMP). Some of the new distribution networks that were installed under the AWSMP merely duplicated existing network sections that continued to draw and distribute water that was not always registered. The above factors help explain why the NRW and UFW have not declined more sharply as a result of the AWSMP. As a corollary the full economic benefits from the AWSMP will not be perceived until all the DD have been confined hydraulically. As a consequence it is not meaningful to undertake an economic cost-benefit of the necessary but not sufficient investments in the conversion of the previous, directly pumped distribution system to the emerging system where water is distributed by gravity to hydraulically confined DD. However, a cost-benefit analysis has been made showing the economic rate-of-return from the further work to reduce the NRW over the coming years and is shown on the adjacent page. The rate of return is estimated at roughly 33%.

COST BENEFIT ANALYSIS OF REDUCTION OF NON-REVENUE WATER (NRW)

Concept	Unit	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Water demand	Mm3/year	64	68	75	82	89	97	97	97	97	97	97
NRW WITH PROJECT	%	0.44	0.43	0.42	0.4	0.38	0.36	0.35	0.35	0.35	0.35	0.35
Water production	Mm3/year	114	119	129	137	144	152	149	149	149	149	149
NRW without project	%	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44
Water production w/o project	Mm3/year	114	121	134	146	159	173	173	173	173	173	173
Water production savings	Mm3/year	0	2	5	10	15	22	24	24	24	24	24
Project cost	MJD	\$22.2	4.0	5.0	6.0	5.0	2.2					
Present value		0										
Cost savings	MJD	\$17.0	1.1	2.4	5.2	8.2	11.5	12.7	12.7	12.7	12.7	12.7
Net Present value of cost savings	MJD	6										
		-										
		17.06										
		\$49.5										
		5										

Benefit cost ratio: 2.90

Economic rate of return: 33%

Annex 4. Bank Lending and Implementation Support/Supervision Processes

(a) Task Team members

Names	Title	Unit	Responsibility/ Specialty
Lending			
Jamal Saghir	Manager	MNSIF	Private sector participation
Suhail Jme'an	Senior Financial Analyst	MNSIF	Financial analysis
Alexander McPhail	Senior Economist	MNSIF	Water Resource Economics
Judy Wilson	Consultant		Legal advisor
Les Nemethy	Private sector development specialist		Private sector development
Andrew Macoun	Principal sanitary engineer	MNSIF	Water and wastewater
Supervision/ICR			
Suhail Jme'an	Senior Financial Analyst	MNSIF	Project Team Leader
Sana Agha Al Nimer	Senior Engineer	MNSIF	Sanitary Engineer
George Nasri Awwad	Consultant	MNSIF	
Alexander E. Bakalian	Lead Water Resource Specialist	MNSSD	
Rachid Bouhamidi	Junior Professional Associate	MNSIF	
Diana C. El Masri	Financial Management Specialist	MNAFM	
Fadi Haddadin	E T Consultant	MNSIF	
Maya Khelladi	Consultant	MNSSD	
Magalie Pradel	Language Program Assistant	MNSSD	

(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		
FY97	57	228.47
FY98	41	163.79
FY99	6	25.29
FY00	1	3.52
Total:	105	421.07
Supervision/ICR		
FY97	0	0.00
FY98	0	0.79
FY99	10	39.97
FY00	41	143.51
FY01	25	86.72
FY02	24	112.68
FY03	18	70.25
FY04	11	56.05
FY05	13	54.00
FY06	11	52.73
FY07	2	11.74
Total:	155	628.44

Annex 5. Beneficiary Survey Results

Available in the project's file.

Annex 6. Stakeholder Workshop Report and Results

(Not applicable)

Annex 7. Summary of Borrower's ICR and/or Comments on Draft ICR

The Programme Management Unit (PMU) of the WAJ provided a draft “World Bank Final Evaluation Project Report” dated January 2007. The report is available in files and deals with the following areas:

- General aspects of the Project
- Performance Based Management Contract
- Operating Investment Fund
- Capital Investment Program
- Institutional Support
- Appendices

The report concentrates on the procurement and disbursement aspects of the different project components.

The PMU also rates the achievement of the overall Project Objectives as follows:

- Sector Policies Substantial
- Physical Substantial
- Financial Substantial
- Institutional Development Substantial
- Environmental Substantial

Social

- Poverty Reduction Not Applicable
- Gender Not Applicable
- Private Sector Development Substantial
- Pubic Sector Management Medium

Rating of Bank and Borrower Performance

Bank Performance:

- Lending Satisfactory
- Supervision Highly Satisfactory
- Overall Highly Satisfactory

Borrower Performance

- Preparation Satisfactory
- Government Implementation Highly Satisfactory
- Implementation Agency Highly Satisfactory
- Overall Highly Satisfactory

Annex 8. Comments of Cofinanciers and Other Partners/Stakeholders

N/A

Annex 9. List of Supporting Documents

World Bank Reports:

Project Appraisal Document from the World Bank dated February 17, 1999 (Report No. 18961-JO).

Loan Agreement of the Amman Water and Sanitation Management Project dated March 18, 1999 (Loan Number 4445-JO).

Project Agreement of the Amman Water and Sanitation Management Project dated March 18, 1999 (Loan Number 4445-JO).

Memorandum of the President of the World Bank on a Country Assistance Strategy for the Hashemite Kingdom of Jordan dated December 20, 2002 (Report No, 25228-JO).

The Hashemite Kingdom of Jordan Water Sector Review Update dated February 15, 2001 (Report No. 21946-JO).

JORDAN: An Evaluation of Bank Assistance for Water Development and Management dated 2004 – OED of the World Bank (Report No. 29367).

JORDAN: Performance Audit Report for the Water Supply and Sewerage Project (Loan 2694-JO) dated July 2, 1996 – Operations Evaluation Department of the World Bank (Report No 15813).

Project Supervision Reports of World Bank missions.

Aide-mémoires of World Bank preparation and supervision missions.

Other Reports:

Hashemite Kingdom of Jordan: Request for Proposals for a Performance-based Management Contract for the Provision of Water and Wastewater Services Amman Governorate dated December 31, 1997.

Hashemite Kingdom of Jordan: Jordan's Water Strategy & Policies CD by Ministry of Water & Irrigation.

Hashemite Kingdom of Jordan: The Programme Management Unit (PMU) of the Greater Amman Water Sector Improvement Programme (GAWSIP) Completion Report dated May 2006.

Ministry of Water and Irrigation Water Authority of Jordan – World Bank/IBRD Draft Final Evaluation Project Report for the Amman Water and Sanitation Management Project, Loan 4445 Amman, January 2007.

USAID/Jordan Report on Phase 1 Analysis of situation and organizational options dated January 2006 IP3/Segura Consulting.

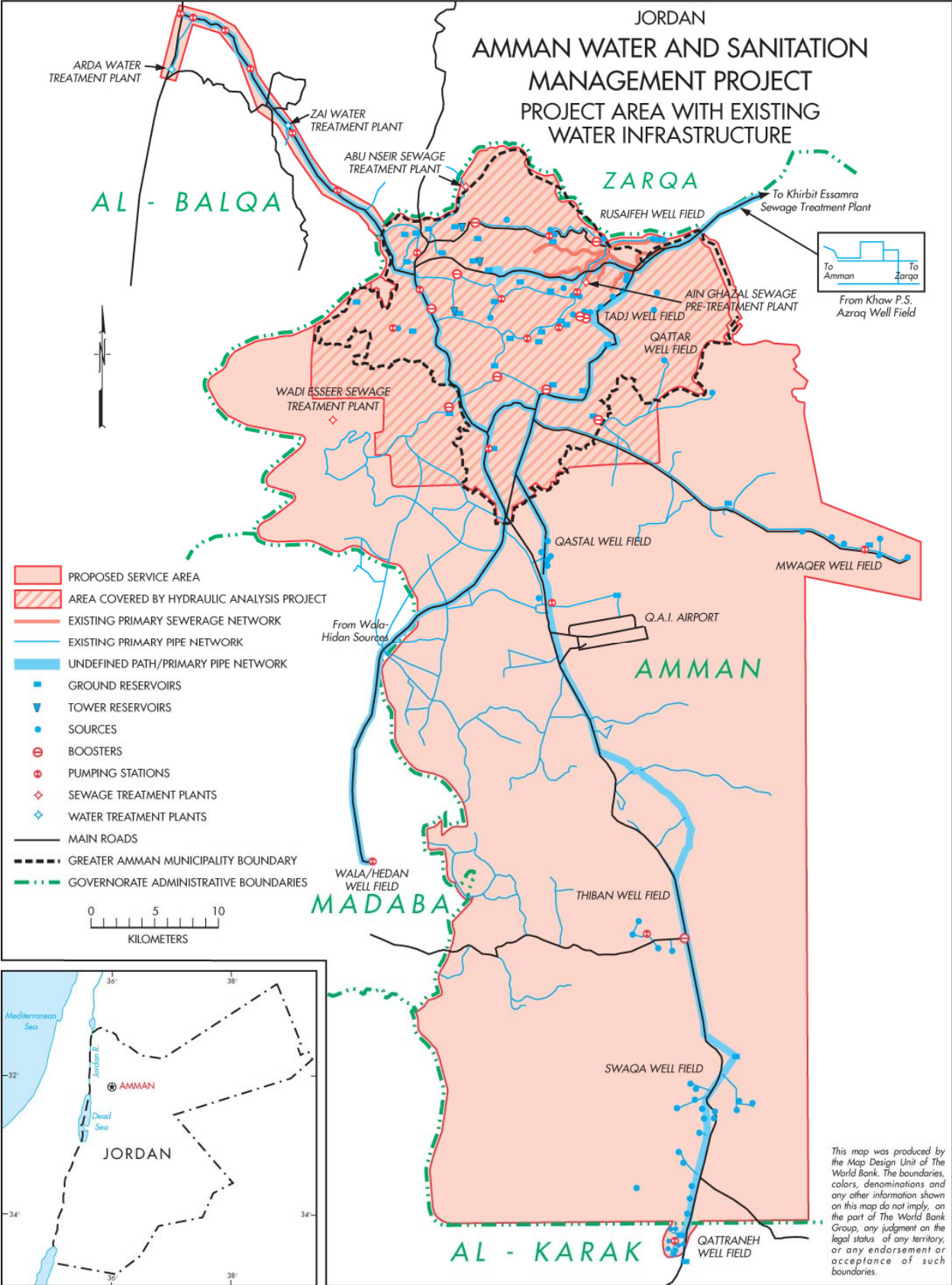
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MAP



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