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IMPLEMENTATION COMPLETION REPORT
(TF-22443)

ON A

TRUST FUND CREDIT

IN THE AMOUNT OF US\$21 MILLION

TO THE

WEST BANK AND GAZA

FOR THE

SOUTHERN AREA WATER AND SANITATION IMPROVEMENT PROJECT

June 29, 2006

Finance, Private Sector & Infrastructure Group
Middle East and North Africa Region

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CURRENCY EQUIVALENTS

(Exchange Rate Effective May 31, 2006)

Currency Unit = New Israeli Sheqalim (NIS)
NIS 1.0 = US\$ 0.22
US\$ 1.0 = NIS 4.52

FISCAL YEAR

January 1 to December 31

ABBREVIATIONS AND ACRONYMS

AFD	Agence Française de Développement (French Cooperation)
CAS	Country Assistance Strategy
DFID	UK Department for International Development
EIB	European Investment Bank
ICB	International Competitive Bidding
IDA	International Development Association
IRR	Internal Rate of Return
JSC	Joint Service Council
MC	Performance-Based Management Contract
MENA	Middle East and North Africa Region
NCB	National Competitive Bidding
NIF	Not IDA-Financed
NPV	Net Present Value
PA	Palestinian Authority
PLO	Palestine Liberation Organization
PMU	Project Management Unit
PWA	Palestinian Water Authority
SAWSIP	Southern Area Water and Sanitation Improvement Project
TF	Trust Fund Number
USAID	United States Agency for International Development
WSSA	Water Supply and Sewerage Authority

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**WEST BANK AND GAZA
SOUTHERN AREA WATER AND SANITATION IMPROVEMENT PROJECT**

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<i>Project ID:</i> P051564	<i>Project Name:</i> SOUTHERN AREA WATER AND SANITATION IMPROVEMENT PROJECT
<i>Team Leader:</i> Sana Kh.H. Agha Al Nimer	<i>TL Unit:</i> MNSIF
<i>ICR Type:</i> Core ICR	<i>Report Date:</i> June 30, 2006

1. Project Data

Name: SOUTHERN AREA WATER AND SANITATION IMPROVEMENT PROJECT

L/C/TF Number: TF-22443

Country/Department: WEST BANK AND GAZA

Region: Middle East and North Africa Region

Sector/subsector: Water supply (48%); Sewerage (47%); Central government administration (5%)

Theme: Access to urban services and housing (P); Rural services and infrastructure (P); Pollution management and environmental health (P); Water resource management (P)

KEY DATES

	<i>Original</i>	<i>Revised/Actual</i>
<i>PCD:</i> 03/09/2006	<i>Effective:</i> 08/23/1999	08/23/1999
<i>Appraisal:</i> 04/29/1999	<i>MTR:</i> 08/31/2001	08/31/2001
<i>Approval:</i> 05/27/1999	<i>Closing:</i> 06/30/2003	12/31/2005

Borrower/Implementing Agency: PLO FOR BENEFIT OF PALESTINIAN AUTHORITY/PALESTINIAN WATER AUTHORITY

Other Partners:

STAFF	Current	At Appraisal
<i>Vice President:</i>	Christian Poortman	Kemal Dervis
<i>Country Director:</i>	A. David Craig	Joseph P. Saba
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2. Principal Performance Ratings

(HS=Highly Satisfactory, S=Satisfactory, U=Unsatisfactory, HL=Highly Likely, L=Likely, UN=Unlikely, HUN=Highly Unlikely, HU=Highly Unsatisfactory, H=High, SU=Substantial, M=Modest, N=Negligible)

<i>Outcome:</i>	U
<i>Sustainability:</i>	UN
<i>Institutional Development Impact:</i>	M
<i>Bank Performance:</i>	S
<i>Borrower Performance:</i>	S

	QAG (if available)	ICR
<i>Quality at Entry:</i>	S	S
<i>Project at Risk at Any Time:</i>	Yes	

3. Assessment of Development Objective and Design, and of Quality at Entry

3.1 Original Objective:

Project Objectives

The stated development objectives of the Southern Area Water and Sanitation Improvement Project (SAWSIP) were twofold:

- i. To improve the sufficiency of water and wastewater services in the Southern Area of the West Bank and the efficiency of water and wastewater services supply to customers in terms of quality, quantity and management by building on existing authorities-- the Water Supply and Sewerage Authority (WSSA - the utility in charge of water and wastewater service provision for most of the Bethlehem Governorate) and the municipal and village water departments within Bethlehem Governorate and Hebron Governorate; and
- ii. To prepare for and implement an appropriate institutional framework for water and wastewater service provision including the implementation of a performance-based management contract and strengthening regulatory and institutional capacity in the Palestinian Water Authority (PWA).

Assessment of Original Objectives and Design

The project objectives and design need to be assessed in the context of the exceptional economic, political and institutional conditions prevailing in the West Bank and Gaza and the overall program the project was a part of. The water sector in the West Bank suffered from historical under investment mainly as a result of inadequate tariffs and high levels of water losses (estimated at 50% in the Project Appraisal Document). Consequently, about one third of the population in the West Bank lacked piped water, and those with access had intermittent levels of service. In addition, per capita availability of conventional water resources was low (103 cubic meters per capita per year, compared to a regional average of 1,250 in the region) with natural water resources under threat from contamination by chlorides, nitrates and other chemicals from irrigation drainage as well as municipal and industrial effluents. Management of the sector was fragmented among municipal departments, village councils, and WSSA, which is considered incompatible with efficient service delivery and integrated management of the limited groundwater resources.

Since July 1996, the Bank-supported Water and Sanitation Services Project (TF-26056) successfully began to address the problem of utility formation in Gaza and served as a model for the preparation of this project. SAWSIP aimed to continue to deepen the reform process in the West Bank while substantially improving the supply of water and sanitation services by addressing: (i) the low levels of service efficiency through increased private sector participation, (ii) high water losses through the implementation of a service improvement program, (iii) lack of piped water supply to rural communities through investment in network expansion and in augmenting bulk water supply, and (iv) improving the sector policy framework through reforms in the tariff levels, and support to the consolidation of management and distribution of services to regional water and wastewater utilities.

The project was developed in close consultation with and participation of PWA, based on the successful and strongly PWA-supported Water and Sanitation Services Project in Gaza (TF-26056) and on PWA's National Water Plan Water (which was under development during project preparation and was finalized in December 2000). It targeted the Bethlehem and Hebron governorates which account for about 30% of the population of the West Bank (about 170,000 people in Bethlehem and 510,000 people in Hebron), and was developed in close consultation with the participating municipalities, all of whom signed a memorandum of understanding on project design and implementation arrangements.

The project objectives were responsive to the needs and priorities of PWA, and supportive of its reform and development strategy. The strategy, as formally set out in the National Water Plan of 2000, had three fundamentals aspects: (a) the consolidation of PWA as the regulator for the sector; (b) the development of its own bulk water supply; and (c) the consolidation of the inefficient and fragmented individual municipal water departments into a system of four Regional Utilities—one in Gaza and three in the West Bank. The objectives were also relevant to two themes of the Bank's Assistance Strategy, World Bank Group Strategy for West Bank and Gaza, dated April 28, 1998, namely: (a) developing an environment conducive to private sector activity; and (b) setting the stage for the emergence of self-governing institutions on a sustainable basis.

3.2 Revised Objective:

The project objectives were not revised.

3.3 Original Components:

The project originally comprised the following main components:

- i. *Management Contract (US\$10 million, 16 percent of total project cost; IDA share: US\$10 million):* This component aimed at financing the Management Contract (awarded through an International Competitive Bidding process) to improve the quality and quantity of water supplied, as well as the management of water and wastewater systems in Hebron and Bethlehem. The contract comprised two fees: (i) a fixed fee for key staff of the operator to supply services and management; and (ii) a performance incentive fees based upon the attainment of specific performance targets built into the management contract. In Bethlehem, where the WSSA is established, the operator would assume full responsibility for the management, operations and maintenance of water and wastewater services; while in Hebron the operator would provide service support and advice with respect to the management, operations and maintenance of water and wastewater services to the municipalities.
- ii. *Operating Investment Fund (US\$10 million, 16 percent of total project cost; IDA share: US\$10 million):* This component aimed at providing the operator and PWA with immediate funds for the purchase of materials supplies and equipment needed to rehabilitate water and wastewater infrastructure and to enhance the efficient operations, maintenance and administration of water and wastewater systems in Bethlehem and Hebron. This operating investment fund was under the control of the operator, subject to the approval of an annual procurement plan, as a way to provide the operator with funds to direct the achievement of the performance standards.
- iii. *Capital Investments (US\$39.3 million, 63 percent of total project cost; IDA share: US\$0 million):* This component aimed at financing 5 pre-identified packages that were considered priority investments under the recently completed master plan for the area, and was to be financed by the European Investment Bank (EIB). These packages included the design, implementation and supervision of investments in system rehabilitation and improvements such as source development, bulk transmission mains, distribution systems restructuring/rehabilitation; and investments in rural water supply.
- iv. *Technical Assistance (US\$3.6 million, 6 percent of total project cost; IDA share: US\$1 million):* This component aimed at supporting the development of institutional capacity within PWA by carrying out studies on the development of a regulatory framework; strengthening the Project Management Unit (PMU) to support the project implementation; as well as finance (a) an independent auditor to evaluate the operator's technical and financial performance and recommend performance incentive payments; (b) consultants to assist in the establishment of a proper financial management, accounting and reporting systems for the PMU, and (c) the project's financial audits. This component was partially financed by the EIB and PWA was to seek grant funding for the components of the technical assistance program

not funded by IDA or EIB.

The components were well chosen and supportive of the objectives. The centerpiece was the internationally procured management contract, designated to pilot the transformation of disparate municipal water departments into a regional utility for the Southern West Bank. The capital investments were intended to significantly increase the supply of water to the region—and EIB had already signed an agreement with the Palestinian Authority for the financing of these investments. The technical assistance supported PWA supervisory and institutional reform responsibilities. The total project cost was US\$62.9 million, of which the World Bank's share was US\$21 million, or about 33% of the total. EIB was responsible for financing about 57% of the project costs, while about 10% was to be financed through local contribution.

3.4 Revised Components:

In August 2000, the Trust Fund Credit Agreement was amended to include the financing of an extension to the performance-based management contract for the services improvement program for water and wastewater systems in the Gaza strip, which until then had been financed separately by the Water and Sanitation Services Project (TF-26056). This change was needed to support the successful achievements by the international operator in improving water and sanitation services in the Gaza strip during the transition period until the follow-on operation to the Water and Sanitation Services Project was approved. This follow-on operation would allow for the provision of water services to be carried out through an operating contract for the management of the recently created Coastal Municipality Water Utility, in which the private operator would have a greater degree of flexibility and autonomy in its daily operations.

The beginning of the second Palestinian Intifada in late September 2000—just one year after effectiveness—ushered in a period of deep crisis in the West Bank and Gaza as a whole. In March 2002, the Bethlehem and Hebron municipalities (the locus of the project) were occupied by Israeli troops. In order to respond to these developments, the World Bank formally restructured the entire portfolio to focus on supporting emergency recovery activities in August 2002. Specifically for SAWSIP, it meant an increased focus in repairing the damaged infrastructure deemed critical for the proper functioning of the water and sewage networks, rather than upgrading and expanding existing infrastructure. In addition, the EIB funds were cancelled due to disagreements between the PA and EIB. With the benefit of hindsight, the project team should have taken advantage of this restructuring to also formally revise the project objectives to better reflect the changing situation on the ground.

Original Project Components	Revised Project Components
1. Management Contract in the Bethlehem and Hebron Governorates, including fixed and performance-based fees	1. Management Contract for the Bethlehem and Hebron Governorates (terminated effective December 2002), as well as Gaza, including (terminated effective September 2003) fixed and performance-based fees.
2. Operating Investment Fund – to finance essential operations and maintenance expenditures not covered by the revenues collected which are required to achieve the yearly performance targets in the management contract	2. Operating Investment Fund – to finance essential operations and maintenance expenditures in the Southern Area of the West Bank and in Gaza that are not covered by revenues collected, as well as emergency needs.
3. Capital Investments – to finance design, implementation and supervision of investments in	3. Component was to be financed in parallel by the cancelled EIB loan. Activities planned under this component were re-packaged under the Emergency

<p>system rehabilitation and improvements, such as source development, bulk transmission mains, distribution systems restructuring/ rehabilitation; and investments in rural water supply.</p>	<p>Investment Program to be financed by the World Bank (through the Emergency Water Project), AFD and USAID.</p>
<p>4. Technical Assistance – supports developing institutional capacity within PWA; establishment of a Project Management Unit (PMU); training and measures to monitor and audit the Operator’s performance.</p>	<p>4. Technical Assistance – to support the operation of the Project Management Units in the West Bank and Gaza, and assistance with project implementation and monitoring activities, as well as preparatory work for the re-launch of the tender process for a new Management Contract to be established in Gaza.</p>

3.5 Quality at Entry:

The project was evaluated by the Quality Assurance Group and was assigned an overall assessment of quality at entry rating of satisfactory, with a highly satisfactory rating for its concept, design and approach. This ICR review agrees with the rating of the quality at entry assessment, mainly on the basis of the following aspects:

- i. *Consistency with Country Strategy:* The project, together with the Water and Sanitation Services Project (TF-26056) and the Electricity Sector Investment and Management Project (TF-26092), was one of the key pillars of the country assistance strategy. These projects were intended to lead the way in infrastructure sector reform in West Bank and Gaza, and in introducing more efficient private sector approaches in the management of infrastructure services.
- ii. *Project Design:* With the exception of the changes made to the management contract to allow for the differing political and institutional environment noted above, the design was very similar the Water and Sanitation Services Project in Gaza (TF-26056 - later designated as an example of best practice in the Bank).
- iii. *Implementation Readiness:* At Appraisal, the management contract was already out to bid, and the contract was initialed with the successful bidder prior to Board submission in May 1999. Further, the project became effective in August 1999 and the operator began work one month later.

Even though the project risks were well defined, and in general, appropriately rated given the overall political context and expectations at the time, with the benefit of hindsight, the political risks, which proved to be near disabling, should have been identified as an 'over-arching' risk that could catalyze the materialization of most of the other identified risks and the mitigating measures geared towards that context, which is effectively what happened during implementation.

4. Achievement of Objective and Outputs

4.1 Outcome/achievement of objective:

Context

The stated objectives turned out to be difficult to achieve, mainly due to the deteriorating political climate and intensification of hostilities. The beginning of the Palestinian Intifada in late September 2000 ushered in a period of crisis, marked by considerable loss of life on both sides; sharp curtailment on the movement of people and goods; major damage to key physical, social and economic infrastructure and services; sharp increases in unemployment and poverty; and considerable dislocation of Palestinian economic and social

life and institutions at all levels.

This dramatic change in operating environment, the financing of the performance-based management contract in the Gaza strip, and the termination of the performance-based management contract in the West Bank by mutual consent in December 2002 resulted in changes to the project's scope and focus. However, the project objectives were not formally revised to reflect this change (the project supervision team considered a formal restructuring of the project on several occasions; however, the team was advised against it internally - more details in section 7.2). As such, this evaluation is based on achievements against the project's original development objectives, while also presenting the project's achievements related to the new priorities established after the departure of the operator in December 2002.

Outcome/achievement of objective

In terms of improving sufficiency and efficiency of water and wastewater services in the southern area of the West Bank, the project's achievements are considered moderately unsatisfactory. This is mainly due to the fact that the EIB financing for the capital investment activities (representing about 63% of the original project costs) was cancelled as a result of disagreements between the PA and EIB. Even though these activities were re-packaged under a different program, progress on implementation of these activities has been slow mainly due to the difficult operating environment. Nevertheless, the project contributed to some positive outcomes in the sector. By 2004, when most of the project implementation activities were completed, unaccounted-for water was reduced by 24% in Hebron and 10% in Bethlehem (considering the overall 50% figure on the project appraisal document as a baseline), and WSSA's operating ratio was 1.27 that year, (WSSA was able to cover its operating expenses). Unregistered connections were eliminated in Hebron and reduced by 56% in Bethlehem. The rehabilitation and improvements carried out enabled the maintaining of levels of provision of water and wastewater services, which some could consider an improvement, since had the project not financed the many additional rehabilitation works due to conflict-damaged infrastructure, there would be a significant deterioration in the provision of these services during the project implementation period. However, even though the general perception is that service delivery has somewhat improved, there is virtually no recent data available on the key performance indicators to substantiate this claim.

As for the preparation and implementation of an appropriate institutional framework for water and wastewater service provision and the building of institutional capacity, the project's achievements are deemed moderately satisfactory. With respect to the building of regulatory and institutional capacity at the national level, the planned tariff studies were undertaken but implementation was postponed because of the dire economic situation at the local level. The proposed new Water Law confirming the regulatory role of PWA and enabling the modernization of the sector, as envisaged in the National Water Plan, was also enacted largely as planned. In terms of the local institutional framework in the Southern West Bank, even though the current framework is not what was originally envisaged by the project, it is considered appropriate given the prevailing circumstances, and there is an appropriate long-term plan on how this framework will evolve into the ultimate goal of having water and wastewater service provision consolidated under one utility in the Southern West Bank.

The performance of the WSSA in Bethlehem has moderately improved with the company being restructured and appropriate systems and operating procedures adopted. Its service area was not expanded; however, services in these areas have been consolidated under two Joint Service Councils (JSCs), and there is an overall understanding that these JSCs will become part of a future Southern Water and Wastewater Utility. In Hebron, the structure of water and wastewater service provision has a different format with PWA's PMU providing support to local government authorities in identifying and prioritizing investment

needs, and ensuring local participation in providing the manpower needed for the undertaking of these investments. This approach has been successful and has ensured participation of local authorities in the decision-making process, and better sense of ownership. As a next step in Hebron, JSCs will be also be formed with the intent of merging them into a future Southern Water and Wastewater Utility.

4.2 Outputs by components:

Management Contract (actual cost US\$8.54 million; IDA share: US\$7.17 million): The operator started work under the management contract in the West Bank on September 1, 1999. Performance in the first year was assessed in January 2001 and the operator's incentive payment was calculated to be 66% of the maximum allowed annual incentive payment. During the second year of the contract (September 1, 2000 - August 31, 2001) working conditions became very difficult due to the beginning of the Palestinian Intifada. The parties agreed to *force majeure* from October 1, 2000 until December 31, 2000, and to a transition period until August 31, 2001. During these periods the operator continued the work to the extent possible and received a fixed compensation with no incentive-based payment. From September 1, 2001 the work was to be honored according to the original contract; however, the situation worsened in early 2002 and the operator declared *force majeure* in April 2002.

In June 2002, an agreement was reached to a six-month transition period between the operator and PWA, after which the project management unit (PMU) would take over the full management of water and wastewater services (funded under the technical assistance component of this project), while the political and security uncertainties were expected to persist. This would allow PWA to re-evaluate its priorities and those of the beneficiaries in the context of the security situation prevailing at the time. An action plan detailing the priorities to be pursued by the PMU was agreed upon and it consisted of: (a) accelerating rehabilitation of damaged networks, (b) maintaining and further developing to the extent possible the management of the WSSA in Bethlehem and the technical assistance provided to the municipalities in Hebron in the management of water and wastewater services, and (c) re-assessing the progress made towards establishing a water utility for the southern area of the West Bank in light of the difficult operating environment and proceeding with the formation of local Joint Service Councils (JSCs) as a first step towards the formation of a regional southern utility.

Given the difficult operating circumstances, the operator was not able to achieve many of the planned targets under the management contract. The operator fell short in meeting the performance targets related to the rehabilitation of the network in Bethlehem and to a lesser extent in Hebron, and on the implementation of programs related to the improvement of local institutional capacity. In addition, even though the operating margin indicator was met in first year, no data is available to measure the progress of this specific indicator since then. A financial and technical audit of the operator's accomplishment against the second year targets to the management contract was carried out, in which the operator's incentive payment was determined to be 35% of the maximum allowed incentive payment. According to the audit, the following were some of the performance targets the operator was able to meet by December 2002: (a) about 2,769 unregistered connections were identified and registered (69% of the estimate baseline value for unregistered connections), (b) unaccounted-for water was reduced by 15% in Bethlehem and by 19% in Hebron, (c) electricity costs were reduced by 19%, (d) 16 kilometers of pipes were replaced/installed in Hebron, and (d) 93% and 89% of the water samples met water quality performance standards in Bethlehem and Hebron respectively.

After the management contract ended in December 2002 and given the difficult operating environment, the PMU focused on network rehabilitation needs and in maintaining to the extent possible the targets achieved by the operator. To this end, unregistered connections were eliminated in Hebron and reduced by 56% in

Bethlehem and unaccounted-for water was further reduced in Hebron by an additional 5%. However, in Bethlehem unaccounted-for water increased by 5% after the operator's departure, resulting on a net reduction of 10% by the end of 2004. Annex 1 has a comprehensive account of the indicators with target and actual values.

With the cancellation of the management contract in the West Bank, the Palestinian Water Authority requested that the remaining available funds in this component be used to finance the extension of the management contract for the management and operation of water and wastewater services in the Gaza strip from August 2000 until September 2003. This management contract was initially funded under the Water and Sanitation Services Project (TF-26056) and its implementation was successful with almost all of the performance targets agreed upon in the management contract achieved. During the extension period financed by this project, the operator continued to satisfactorily operate and manage water and wastewater services in the Gaza strip.

It is important to note that the financing of this extension was needed due to unforeseen delays encountered in the preparation of the documentation to carry out the bidding process for the next stage of private sector involvement in Gaza. The financing was meant to be a short-term interim measure until the selection process of a lease contractor was complete; this new contract would be financed by the World Bank under a new project. A request for qualifications was issued in December 2000; however, given the deteriorating operating circumstances due to the conflict, the bidding process was held back, and unfortunately the Palestinian Authority did not have the funding from its own resources to continue paying for the fees of the management contract in Gaza, which at that stage had to be extended.

In early 2003, PWA came under increasing pressure for reasons of transparency and accountability to select a new operator, instead of continuing to extend the current management contract. A request for proposals was issued, but ultimately none of the pre-qualified bidders submitted a proposal. As such, the management contract expired in September 2003 and interim arrangements were put in place, where the PWA retained the services of the local staff that worked for the operator as consultants to continue to oversee the management and operation of water and wastewater services. The staff were financed under this project's technical assistance component.

Operating Investment Fund (actual cost US\$12.34 million; IDA share: US\$10.55 million): This fund played a crucial role for the overall improvement of the water and wastewater network infrastructure, as well as in responding to the emergency rehabilitation needs prompted by the conflict. The operator for the management contract in the West Bank used the funds to repair and replace about 1,230 water meters, 1,377 service connections, 28.7 kilometers of piping in Bethlehem and Hebron as well as other network operational improvements based on a mutually agreed procurement plan with PWA. After the management contract was cancelled, the PMU used the available funds to maintain and improve the network performance. It provided support to the WSSA in Bethlehem and established a modus operandi in Hebron in which projects funds were used to purchase the goods required for rehabilitation, and project-area beneficiaries were relied upon for either financing the works required or physically contributing towards implementation under the supervision of the PMU. As such, by 2004 (when most of the project activities were complete) an additional 10,470 water meters were repaired and replaced, 9,323 service connections and 53.6 km of piping were replaced in Bethlehem and Hebron under the overall supervision of the PMU.

At the request of the PWA, a portion of this fund was re-allocated to be used by the management contractor and later by the PMU in charge of managing and operating water and wastewater services in the Gaza strip in order to maintain the level of services and rehabilitate the network as needed, especially given the frequent Israeli incursions into several areas of the strip. About 2,500 leak repairs were made, and the

meter installation program was continued with about 7,366 domestic and 128 public meters rehabilitated and/or installed, 38 bulk meters were rehabilitated, and about 40 kilometers of pipes were replaced in municipalities that had reported lower system efficiencies. These measures contributed to maintaining the levels of system efficiency at about 64%. In addition, water quality performance standards were kept, with about 100% disinfection efficiency. The reallocation of funds to be used to implement rehabilitation activities in Gaza resulted in the scaling back of activities planned to be financed in the West Bank.

Capital Investments: This component was to be financed by the EIB; however, the EIB funds were cancelled as a result of disagreements between the PA and EIB. Therefore, the PWA had to re-evaluate its investment priorities and find alternative sources of funding for implementing capital investment works. The five packages identified for financing under this component were re-packaged under a separate program with an estimate cost of US\$48.9 million. Financing for this program was obtained from the World Bank (The Emergency Water Project - TF-52627 - US\$12.5 million), the Agence Française de Développement (AFD - US\$6.5 million) and the United States Agency for International Development (USAID - US\$55 million), as described in the Technical Annex of the Emergency Water Project (TF-52627). The delays incurred due to financing issues had a negative impact on the achievement of SAWSIP's original targets, especially the ones related to constancy of supply.

The implementation progress of the Emergency Water Project (TF52627) is considered satisfactory, the pipeline linking the Halhoul and Nuba reservoirs has been completed, and most of the major contracts have been awarded, are under construction, and all project activities are expected to be completed by mid-2007. As for the AFD and USAID financed portions of the program, progress is reported to be unsatisfactory, given the slow progress on the implementation of most of the activities mainly due to the difficult operating environment and the uncertainty over the availability of USAID funds in the current political context. In spite of the delays, the AFD-financed works are expected to be completed in early 2008, however, it is unclear whether the activities planned to be financed by USAID will proceed as planned given the current political environment.

Technical Assistance (actual cost US\$5.34 million; IDA share: US\$2.71 million): The technical assistance component funded the two audits carried out on the performance of the operator in achieving the targets stipulated in the management contract. In addition, it financed the costs of the West Bank PMU, and since August 2000, the costs of the Gaza PMU as well. Since the termination of the management contract in December 2002, technical assistance to the PMU in the West Bank was stepped up in order to strengthen the team and ensure it was appropriately staffed to undertake its new responsibilities. The same happened with the Gaza PMU after September 2003, when the management contract expired.

Some of the other technical assistance activities supported by the project included the plan to expand the service area for the WSSA to include additional areas in the Bethlehem Governorate. In this respect, the PMU worked in the villages of Bethlehem supporting the formation of two JSCs, namely the Eastern JSC and the Western JSC responsible for management and operation of water and wastewater services in their respective areas. As a next step, the PMU and PWA plan to support the formation of a Southern JSC in which the Eastern and Western JSCs would be merged, and an understanding has been reached that in the medium-term this joint service council will become part of a Southern Regional Utility.

At the WSSA, the PMU has worked with the operator and after the termination of the management contract to restructure the company, namely the following has been achieved: (a) an organizational structure has been defined with detailed job descriptions for senior positions, (b) the scope of work of each department was defined and the current staff was evaluated and mapped to the new organization structure according to their qualifications, (c) standard operating procedures were set for technical operations, (d) a valuation of

WSSA's assets was completed, (e) a new billing and collection, accounting, and payroll systems were set up and are working satisfactorily—the PMU continues to provide technical assistance and training on these systems as needed, and (f) financial and procurement procedures were defined and adopted by WSSA.

In Hebron, where the water and wastewater services are management by the water departments within the local governments/municipalities, the technical assistance provided by the PMU has taken a slightly different format. During project preparation and at early stages of project implementation, the PWA held meetings with local government officials, during which it was understood and agreed that the operator would set up technical service centers using the technical staff from the water departments with the ultimate objective of integrating these centers in the future into one regional utility. However, with the departure of the operator and the increasingly difficult operating environment, a slightly different structure was agreed upon, in which a PMU coordinator is designated to work with each technical center and local government authorities to identify the priority needs in terms of equipment and materials. Once these needs are identified, the PMU coordinator submits a request for evaluation by the PMU management, and if the request is approved the material and equipment required for project implementation are provided to the communities, who are required to provide the manpower for the installation, which is carried out under the supervision of PMU engineers. This arrangement has proven to be successful in Hebron, empowering the communities to participate in the decision-making process and increasing their sense of ownership.

An assessment on the institutional and financial feasibility of the formation of a set of JSCs in Hebron for water and wastewater was undertaken and there is broad agreement that the formation of JSCs is a positive next step in terms of improving the provision of water and wastewater services. USAID was financing a Village Water and Sanitation Program that would facilitate the formation of these JSCs, with the intent that in the medium- to long-term these JSCs could be merged into a utility, provided circumstances allow for it. As mentioned above, the materialization of USAID funds is not certain given the current political context.

4.3 Net Present Value/Economic rate of return:

The ex-post economic rate of return of the project is estimated at 11 percent and the Net Present Value (NPV) was at NIS 1.41 million, which is less than what was estimated at appraisal. As water tariffs were taken as proxy for economic benefits, these results are more a reflection of the level of tariffs than indicative of the worth of the project per se. Consumers' willingness to pay would have been a better measure, but data are unfortunately not available. Annex 3 has the detailed economic analysis calculations.

4.4 Financial rate of return:

Not assessed.

4.5 Institutional development impact:

The project's institutional development impact was modest. Improvements have been made in the operation of the WSSA where the operator and the PMU have had a positive impact in terms of defining the organization's structure, setting up procedures and improving internal systems (i.e., billing and collection, accounting, etc.). However, WSSA still has much more to do in terms of improving the company's performance as an efficient provider of water and wastewater services. In addition, progress was made in terms of planning and gradually implementing an institutional restructuring plan (i.e., formation of village and joint service councils, as well as establishing a system for working with local authorities) that will ultimately enable the formation of a single utility for provision of water and wastewater services in the southern West Bank.

In Gaza, the project enabled the retaining of local technical staff that used to work for the operator under the first management contract, allowing for a continuity in service provision and helped in the transition to the new operator, who was awarded a contract for management of water and wastewater services in early 2005. This new operator will be responsible for the formation of the Coastal Municipalities Water Utility, responsible for the provision of water and wastewater services for the entire Gaza Strip.

5. Major Factors Affecting Implementation and Outcome

5.1 Factors outside the control of government or implementing agency:

The Palestinian economic recovery that began in 1998 came to an abrupt halt with the start of the second Intifada in September 2000, and the subsequent imposition of closures, curfews and tight movement restrictions on the Palestinian population. The areas targeted under the project (i.e., Bethlehem and Hebron) were occupied by Israeli troops, which made for a very difficult and stressful operating environment and had a significant negative impact on the ability to implement the project as originally planned.

5.2 Factors generally subject to government control:

The cancellation of EIB funds was outside the control of the project and negatively affected the implementation of the capital investment component. Details on the events leading to this cancellation are not entirely clear; however, once there was mutual agreement to cancel the funding for the project, the Ministry of Finance should have perhaps supported PWA more actively in quickly securing the financing needed for the timely implementation of the activities planned under the capital investment component.

5.3 Factors generally subject to implementing agency control:

Between effectiveness in August 1999 and December 2002, the PMU provided supervisory control over the management contract operator, who was largely responsible for implementation, and its performance is considered satisfactory - although the March 2001 audit stressed the need for improved communications between the PMU and the operator.

After the termination of the management contract in 2002, the increasing amount of pressure the PMU was under in terms of taking over the functions performed by the operator resulted in the lack of adequate monitoring and reporting systems, which compromised the quality of the data available for project monitoring and reporting, including this review. Given the deteriorating environment, the PMU showed a unique ability to adapt to current circumstances, and to provide adequate technical assistance, and to the extent possible, financial support to the Bethlehem and Hebron Governorates in the management and operation of their water and wastewater systems.

5.4 Costs and financing:

As detailed in Annex 2, the expenditure on Bank-supported components was about US\$20.43 million or 97 percent of the appraisal estimate. The cancellation of the management contract in the West Bank freed up funds to finance support to the adequate provision of water and wastewater services in Gaza. As such, the financing for West Bank-related activities was reduced by about 43 percent. The overall project expenditure stands at about US\$34.8 million, which represents about 55 percent of the appraisal estimate. This difference is mainly related to the cancellation of EIB financing, as explained in section 5.2 above.

6. Sustainability

6.1 Rationale for sustainability rating:

Project sustainability is considered unlikely. Some positive achievements have been made in terms of improving the provision of water and wastewater services to the population in Bethlehem, Hebron and Gaza, and steps have been taken towards implementing an appropriate institutional framework for the reliable provision of water and wastewater services. However, PWA remains dependent on the assistance of donors for financing its activities, including system operation and maintenance, mainly due to the fact that renewed hostilities have had a significant negative impact in the Palestinian economy, with incomes declining by about one third and nearly a quarter of its work force unemployed. As such, this prevailing volatile context has prevented the PWA from implementing much needed tariff increases, and represents an impediment to increasing revenue collection. In addition, the political outlook remains highly uncertain, the election of Hamas and subsequent dwindling of donor support to a Hamas-led PA have increased the likelihood that the achievements under the project will not be sustained.

6.2 Transition arrangement to regular operations:

PWA continues to put forth its best efforts in terms of applying donor funding towards implementing activities that will either maintain or improve the level of supply of water and wastewater services in the West Bank and in Gaza; however, given the volatile situation on the ground, it is unlikely that a transition to regular operations can be made in the near future.

7. Bank and Borrower Performance

Bank

7.1 Lending:

The Bank's performance during preparation is considered satisfactory. The project was well prepared technically, and its approach was modeled after the successful experience with a performance-based management contract in Gaza. In addition, the selection of the management contract operator was carried out up front and in time for early project start. Project preparation was based on consultations with key institutional stakeholders, which helped achieve some degree of institutional consensus in the employment of a private operator to manage the provision of water and wastewater services.

With the benefit of hindsight, the project team should perhaps have devoted some more time to consultations, and tried to better adapt some of the performance targets to the specific institutional context in the West Bank; since during implementation of the management contract there were some issues in terms of (i) misunderstanding of duties and expectations of the management contractor vis a vis some of the stronger municipalities, and (ii) the lack of clear definition of the institutional capacity building component, and appropriate incentives for the operator to carry out these activities in the earlier part of the contract.

7.2 Supervision:

The Bank's performance during supervision is considered satisfactory. The Bank supervision team faced many challenges, including difficulties in carrying out supervision missions on a regular basis after the beginning of the second Intifada in September 2000. In spite of these constraints, the Bank kept in close contact with and responded effectively to the changing needs on the ground, including the termination of the management contract in December 2002, the development of an Action Plan to ensure the level of service provision would not be negatively affected by the contract's termination, and the need to support the then ongoing Water and Sanitation Services Project in Gaza (TF-26056).

In addition, the Bank team provided effective and timely support to PWA in re-evaluating and re-packaging of its investment priorities, given the cancellation of EIB financing for the capital investment components planned under the project, as well as in mobilizing Bank resources (Emergency Water Project - TF-52627) and in enlisting the support from other donors in the financing of these new priorities.

Nevertheless, there were some shortcomings, particularly related to the establishment of sufficiently clear monitoring and reporting framework and mechanisms after the departure of the operator in December 2002. In addition, with the benefit of hindsight, the team should have formally restructured the project objectives and indicators to reflect the changes in focus and scope during implementation as a result of the difficult operating environment. Instead of formally restructuring the project, restructuring it on an 'informal' basis through amendments to the Trust Fund Credit Agreement was recommended internally as a more effective way to adapt the project to the changing situation on the ground.

7.3 Overall Bank performance:

Based on sections 7.1 and 7.2, overall Bank performance is considered moderately satisfactory.

Borrower

7.4 Preparation:

As the main representatives of the Borrower, the PWA and the Ministry of Finance were very actively involved in project definition and preparation. They facilitated the consultations with key institutional stakeholders and cooperated effectively with the Bank, taking the appropriate steps to ensure effective project selection, design and contract documentation. Further, they ensured the timely effectiveness of the project and strengthened PMU's accounting and financial management capabilities in preparation for implementation. As such, the Borrower's performance during preparation is considered satisfactory.

7.5 Government implementation performance:

Government implementation performance is considered satisfactory, in the context of the difficult operating environment. In general, the PA (again represented by the Ministry of Finance and the PWA) were supportive and met most of their project obligations effectively and on time. In addition, the Ministry of Finance effectively handled a nagging value-added tax refund issue—before it had a negative impact on the project. Further, the PWA took the steps necessary to carry out the required tariff studies and to secure the passage of a new Water Law. The latter mandated the establishment of a new institutional framework, under which a National Water Council was established as the main policy-making body for the sector; the PWA's role as a sector regulator was ratified; and the proposed strategy of establishing a Bulk Water Authority and Regional Utilities was confirmed. As mentioned above, the much needed tariff increases were not implemented, mainly due their infeasibility given the deterioration of the Palestinian economy as a result of the volatile political context.

7.6 Implementing Agency:

The performance of the West Bank PMU in implementing the project under the very trying conditions is considered satisfactory. The PMU in the West Bank was able to effectively shift from the role of monitoring and facilitating the work of the operator under the management contract framework, to taking over the operator's duties and completing the project, while at the same time managing the overall emergency response to the deteriorating circumstances in the West Bank. As mentioned above, one of the shortcomings was the lack of an appropriate framework for monitoring and reporting overall progress towards the achievement of indicators after the departure of the operator, which could be attributed to delays in hiring additional staff to cope with the increased workload, in spite of insistence from the Bank team to expedite recruitment. The PMU in Gaza, was able to effectively implement the activities financed under the project and to continue systematically monitoring the indicators established under the Water and Sanitation Services Project.

7.7 Overall Borrower performance:

Based on sections 7.4, 7.5 and 7.6 overall Borrower performance is considered moderately satisfactory.

8. Lessons Learned

- When planning a private transaction in a risky country, establishing at the onset an adequate fall-back option might prove critical to ensure overall continuity in approach. With the benefit of hindsight, given the inherent difficult operating environment in West Bank and Gaza it may have been useful to explore in advance some alternative arrangements to improve the sector's operational and managerial efficiencies even in the absence of a management contract.
- The project design should be tailored to the specific local prevailing circumstances. In the West Bank, given the number of players involved (i.e., municipalities, WSSA, villages, etc.), involvement of local partners public or private should have been emphasized, with responsibility for project outcomes shared among all parties (beneficiaries and operator).
- Project teams should be allowed and encouraged to think outside of the box and support innovative ways of designing and implementing projects in West Bank and Gaza. Bank guidelines need to be flexible and one should not expect to design and implement projects in West Bank and Gaza as it is done in other countries.
- Where a project restructuring is justified by a change in the operating environment, the restructuring should be formal. It is unclear in this case why a formal project restructuring was not done. As a result, a project which had a satisfactory outcome in reality cannot be formally rated as such.
- Co-financing of Bank operations from other donors should be minimized when the possibility of cancellation of a large portion would jeopardize project outcomes; in such difficult and politically charged environment, the Bank should be the major funder, while co-financing in small amounts from other donors might be acceptable. Given the limited availability of funding for projects in West Bank and Gaza, parallel financing should be the preferred alternative to leverage our financing against that of other donors.

9. Partner Comments

(a) Borrower/implementing agency:

In addition to its "Implementation Completion Report" presented in Annex 8, the Borrower commented on the Bank's draft ICR. The Borrower agreed that a formal restructuring of the Project would have been warranted given the exceptional economic, political and institutional circumstances. At the same time, the Borrower considered that the PMU performance was satisfactory.

(b) Cofinanciers:

(c) Other partners (NGOs/private sector):

Not applicable

10. Additional Information

Not applicable.

Annex 1. Key Performance Indicators/Log Frame Matrix

Project Outcomes (as of end-2004 when most implementation activities were completed)

Outcome	Indicators	
	Southern West Bank	Gaza
Improve sufficiency and efficiency of water and wastewater services	<p>Contribution towards:</p> <ul style="list-style-type: none"> • 10% and 24% reduction in unaccounted-for water in Bethlehem and Hebron respectively • 1.27 operating ratio achieved in Bethlehem. Operating ratio figure not available for Hebron • Unauthorized connections eliminated in Hebron and reduced by 55% in Bethlehem. • No data available on constancy of supply. 	<ul style="list-style-type: none"> • Overall system efficiency maintained at around 64% • 2,500 leak repairs performed • Average disinfection efficiency of 100%
Prepare and implement an appropriate institutional framework for water and wastewater service provision; and build regulatory and institutional capacity	<ul style="list-style-type: none"> • Tariff study undertaken, but implementation postponed due to difficult operating environment. • Proposed Water Law enacted. • Support to restructure WSSA. • Support for the consolidation of service councils into two Joint Service councils for areas in Bethlehem not served by WSSA. • In Hebron, municipal technical centers in charge of identifying priorities with PMU. Investment is maximized through contributions from beneficiaries towards manpower for installation of works. 	<ul style="list-style-type: none"> • Support to retain the local staff that used to work for operator, enabling continuity of service provision. • Assisted PMU in awarding a contract to a private operator for the management of water and wastewater services in early 2005.

Note: Data as of October 2004 when most of the project activities were completed.

West Bank – Specific output indicators

Summary	Indicators	Target		Actual Achievement	
		BG	HG	BG	HG
Outputs:					
1. Improved management of water and wastewater services in the project area	Increase Accounted-for-Water to 75% in both, BG and HG				
	1. (Yr 1) Sep 00 -MC	60	60	63	69
	2. (Yr 2/3) Dec 02 -MC	67	67	65	--
	3. (Yr 3) Oct 03 -PMU	72	72	--	--
	4. (Yr 4) Oct 04 -PMU	75	75	60	74
	Improve constancy of supply of piped water for all customers to 70% of month				
	1. (Yr 1) Sep 00 -MC	40	40	73	28
	2. (Yr 2/3) Dec 02 -MC	50	50	--	--
	3. (Yr 3) Oct 03 -PMU	60	60	--	--
	4. (Yr 4) Oct 04 -PMU	70	70	--	--
	Increase operating ratio to 1.5 and 1.3 in BG and HG, respectively.				
	1. (Yr 1) Sep 00 -MC	1.1	1.1	1-1.3	1.26
	2. (Yr 2/3) Dec 02 -MC	1.2	1.1	--	--
	3. (Yr 3) Oct 03 -PMU	1.35	1.2	--	--
	4. (Yr 4) Oct 04 -PMU	1.5	1.3	1.27	--
	Reduce electricity usage per unit of water delivered by 20% in BG and HG.				
	1. (Yr 1) Sep 00 -MC	2.5	2.5	19	0
	2. (Yr 2/3) Dec 02 -MC	5	5	19	--
	3. (Yr 3) Oct 03 -PMU	10	10	--	--
	4. (Yr 4) Oct 04 -PMU	20	20	85	--
2. Rehabilitated water and wastewater network.	Repair and replace 2,000 and 4,000 of water meters in BG and HG, respectively.				
	1. (Yr 1) Sep 00 -MC	500	500	539	405
	2. (Yr 2/3) Dec 02 -MC	1500	3,000	335	895
	3. (Yr 3) Oct 03 -PMU	--	500	--	--
	4. (Yr 4) Oct 04 -PMU	2,000	4,000	5,120	6,595
	Replace 3,500 and 5,000 service connections in BG and HG, respectively.				
	1. (Yr 1) Sep 00 -MC	500	500	737	0
	2. (Yr 2/3) Dec 02 -MC	1,000	1,500	802	575
	3. (Yr 3) Oct 03 -PMU	1,000	1,500	--	--
	4. (Yr 4) Oct 04 -PMU	3,500	5,000	5,266	5430
	Replace 70 and 30 km of piping in BG and HG, respectively				
	1. (Yr 1) Sep 00 -MC	0	5	0	0
	2. (Yr 2/3) Dec 02 -MC	30+15	10	12.7	16
	3. (Yr 3) Oct 03 -PMU	25	10	--	--
	4. (Yr 4) Oct 04 -PMU	70	30	45	40
	% Reduction of Unregistered Connections (Water Accounts; no cum)				
	1. (Yr 1) Sep 00 -MC	10	10	19	11
	2. (Yr 2/3) Dec 02 -MC	25	25	56	--
	3. (Yr 3) Oct 03 -PMU	60	60	--	--
	4. (Yr 4) Oct 04 -PMU	100	100	55	100

-- : data not available / BG: Bethlehem Governorate / HG: Hebron Governorate / MC: Management Contract / PMU: Project Management Unit

Gaza – Specific output indicators

Activity & Output	Achievement
1. Water Network Maintenance & Leak Repairs	
Assist in repairing leaks detected by the operator and /or reported by the municipalities.	Water network maintenance and leak repairs performed with outstanding results. Total of around 2500 leak repairs accomplished during the reference period, out of those, 1750 repairs for pipes 50 mm and above.
2. Overall System Efficiency	
Meter total consumption in m ³ within the referenced period	Sustainable status of system efficiency achieved during the course of the Interim Emergency Program (IEP, Nov.2003– Oct.2004). Unfortunately, no progress achieved during the same period. Due to several severe pipe bursts resulted from the Israeli frequent incursions, leak repairs could not be carried out promptly since access to concerned sites was denied. 63.68 % overall system efficiency.
3. Meter Replacement	
Replace damaged meters for both domestic and public buildings	7366 domestic water meter & 128 meters for public buildings replaced.
4. Municipal Water Meters Repair	
Repair Water Meters for Municipal Wells	Meters recalibrated and tested to meet the metrology standard for Class B meters in international standard (IS) 4064 . Total achievement 38 wm .
Repair Domestic Meters	Found more economic to purchase new meters than to repair old \$20 new vs. \$15 old). Decided to abandon the repair of domestic meter. All defective meters existing in PWA stores are sold at public auction. Repair work only carried out for water meters of large sizes (6-inch& 8-inch) used for water wells in the Municipalities.
5. Meter Reading Auditing Program	
Improve existing meter reading service to increase the reliability of the consumption figures,	Exercise resumed in the second half of the interim emergency program period and auditing team employed on the first of June 2004. Key tasks included: recognizing and verifying meter readings taken by the municipal meter readers and identify the gaps in the reading cycle; checking out the meter readings and identifying unread meters, particularly public buildings and large consumers; Identifying possible water consumptions that are unmeasured; identifying all possible reasons for unaccounted for water including illegal water consumption; providing municipal team with all assisting information, advice and following up the implementation of the proposed programs; continuing data flow from the municipalities to the PWA.
6. House Connections & Pipes Replacement Program	
Replace house connections, distribution networks and installing new connections.	3,396 service connections completed and 40,000 meters of pipes ? 50mm installed
7. Improve Water Disinfection	
Re-calibrate testing kits-each three months. points)	Excellent average disinfection efficiency of the municipal water networks achieved and 100% of the tested monthly samples showed positive results. The total number of samples 445 .
8. Operation and Maintenance of Waste-water Systems	
Maintain Electromechanical Operational Ratio = ai X (Rti / Mti) where, (ai) is the weight factor of each equipment, the maximum value of (ai) is one, (Rti) is the actual running hours of the equipment measured with hour meters (Mti) is the maximal time required by the process	Overall electromechanical operation ratio 89.5% (the target in the service improvement program was 89.6%) and the overall wastewater improving quality composite achievement 93.5% . Many repair, maintenance and rehabilitation projects identified and launched in order to enhance functionality of the wastewater facilities. More than US\$2m invested for this important target.
9. Develop and Update Customer database	
Update and maintain oracle customer database based on the delivered new customers from the municipalities. Operate and support of X7 system in the pilot area municipalities.	Total number of water and wastewater customers in the database has reached 103,337 customers by the end of October 2004. (Number does not include the customers of the new small village councils.)

Activity & Output	Achievement
10. Maintenance and other activities	
Maintain & where necessary and possible, upgrade existing equipment & systems.	Achievements include: supply, refurbishment, installation and/or maintenance of: standby power supply diesel generators; pumping sets for water production wells; electrical control switch boards; complete electrical drive motors for water wells critical electrical and mechanical spare parts and materials required by PWA stores for periodic repairs and maintenance of the municipal water plant equipment and installations; critical electrical and mechanical spare parts and equipment; complete new pumping sets for water production wells & all chlorine dosing equipment with all associated spare parts and consumables which are essentially required to verify and secure water disinfection task; chlorine dosing equipment located at various municipal water production installations and essentially required to maintain water disinfection throughout water distribution networks; 1,000 m ³ /hour brackish water desalination plant located at Deir Al Balah municipality; Rafah main water booster station and Bani-Suhaila regional water booster station; & new water well L173 at Al Qarara municipality.

Annex 2. Project Costs and Financing

Table 1: Project Costs by Component (US\$ million equivalent)

Project Component	Appraisal Estimate (Total)	Appraisal Estimate (IDA)	Actual/Latest Estimate (Total)	Actual/Latest Estimate (IDA)	Actual/Appraisal (Total)	Actual/Appraisal (Bank)
	(US\$ m)		(US\$ m)	(US\$ m)	(%)	(%)
1. Management Contract Fees	10.00	10.00	8.54	7.18	85%	72%
West Bank	10.00	10.00	5.28	4.44	53%	44%
Gaza	-	-	3.26	2.74		
2. Operating Investment Fund	10.00	10.00	12.33	10.55	123%	105%
West Bank	10.00	10.00	6.56	5.61	66%	56%
Gaza	-	-	5.77	4.94		
3. Capital Investments	39.34		8.52		22%	
West Bank	39.34		3.51		9%	
Gaza	-	-	5.01			
4. Technical Assistance	3.57	1.00	5.34	2.71	150%	271%
West Bank	3.57	1.00	2.84	1.28	80%	128%
Gaza	-	-	2.50	1.43		
Total Project Cost	62.91	21.00	34.73	20.44	55%	97%
West Bank	62.91	21.00	18.19	11.33	29%	54%
Gaza			16.54	9.11		

Table 2: Project Costs by Procurement Arrangements (Appraisal Estimate)

Category	Procurement Method				Total
	ICB	NCB	Other	NIF ¹	
	(in US\$ million equivalent)				
1. Works					
1.1 Capital Investments (EIB Packages)				33.12	33.12
1.2 Allocations from BG & HG Budgets ²				6.22	6.22
1.3 Operating Investment Fund (OIF) ³	1.7	1.5			3.2
<i>subtotal</i>	1.7	1.5		39.34	42.54
<i>Sub-total Works</i>	1.7	1.5	-	39.34	42.54
IDA Share	(1.70)	(1.50)	-	-	(3.20)
2. Goods					
2.1 Operating Investment Fund (OIF) ³	2.5	1	2.9		6.4
2.2 Support for PMU (by EIB)				0.37	0.37
<i>Sub-total Goods</i>	2.5	1	2.9	0.37	6.77
(IDA Share)	(2.50)	(1.00)	(2.90)	-	(6.40)
3. Management Contract					
3.1 Management Contract Fixed Fee ⁴	8				8
3.2 Performance Incentive Compensation ⁵	2				2
<i>Sub-total Goods</i>	10	-	-	-	10
(IDA Share)	(10.00)	-	-	-	(10.00)
4. Services					
4.1 Consultant Services			1	1.82	2.82
4.2 Support for PMU (by EIB)				0.38	0.38
<i>Sub-total Services</i>	-	-	1	2.2	3.2
(IDA Share)	-	-	(1.00)	-	(1.00)
5. Incremental Operating Expenditure ⁶			0.4		0.4
(IDA Share)			(0.40)		(0.40)
Total	14.2	2.5	4.3	41.91	62.91
(IDA Share)	(14.20)	(2.50)	(4.30)	-	(21.00)

Notes:

1/ Includes financing of ECU30.0 million by EIB (US\$35.69 million equivalent).

2/ This represents local counterpart funding required to:

a. Maintain operating and financing to levels prior to the Management Contract, to cover staff, power, and consumables.

b. Any additional funds required for works and goods beyond the Operating Investment Fund.

3/ Procurement from OIF is based on an approved yearly procurement plan in accordance with the Bank's Procurement Guidelines.

4/ The total Management Contract fixed fee for the term of the Contract shall not exceed US\$8.0 million and is subject to competitive bidding.

5/ The total Performance Incentive Compensation for the term of the Contract exceeds US\$2.0 million and is not subject to competitive bidding.

6/ Using Statement of Expenditures (SOE).

N.I.F. = Not IDA-financed.

Figures in parenthesis are the amounts to be financed by the IDA Trust Fund Credit.

Totals may not add because of rounding

Table 3: Project Costs by Procurement Arrangements (Actual/Latest Estimate)

Category	Procurement Method				Total
	ICB	NCB	Other	NIF	
	(in US\$ million equivalent)				
1. Works					
1.1 Capital Investments (EIB Packages)				3.51	3.51
1.2 Allocations from BG & HG Budgets					
1.3 Operating Investment Fund					
<i>subtotal</i>				3.5	3.5
1(b) Gaza		1.99		5.02	7.01
<i>Sub-total Works</i>		1.99		8.53	10.52
IDA Share		(3.38)			(3.38)
2. Goods					
2.1 Operating Investment Fund			3.80		3.80
2(b) Gaza			2.95		2.95
2.2 Support for PMU (by EIB)					
<i>Sub-total Goods</i>			6.75		6.75
IDA Share			(6.75)		(6.75)
3. Management Contract					
3.1 Management Contract Fixed Fee	5.28				5.28
3(b) Gaza			3.26		3.26
3.2 Performance Incentive Compensation					
<i>Sub-total Goods</i>	5.28		3.26		8.54
IDA Share	(4.43)		(2.74)		(7.17)
4. Services					
4.1 Consultant Services			2.84		2.84
4(b) Gaza			2.50		2.50
4.2 Support for PMU (by EIB)					
<i>Sub-total Services</i>			5.34		5.34
IDA Share			(2.79)		(2.79)
5. Incremental Operating Expenditure			0.23		0.23
5(b) Gaza					
IDA Share			(0.23)		(0.23)
Total	5.28	1.99	15.58	8.53	31.37
IDA Share	(4.43)	(3.38)	(12.50)		(20.31)

Notes:

N.I.F. = Not IDA-financed.

Figures in parenthesis are the amounts to be financed by the IDA Trust Fund Credit.

Totals may not add because of rounding

Table 4: Project Financing by Component Appraisal Estimate Actual/Latest Estimate (in US\$ million equivalent)

Project Component	Appraisal Estimate (Total)	Appraisal Estimate (IDA)	Appraisal Estimate (Govt)	Appraisal Estimate (Cofin)	Actual/Latest Estimate (Total)	Actual/Latest Estimate (IDA)	Actual/Latest Estimate (Govt)	Actual/Latest Estimate (Cofin)
	(US\$ m)	(US\$ m)	(US\$ m)	(US\$ m)	(US\$ m)	(US\$ m)	(US\$ m)	(US\$ m)
1. Management Contract Fees	10.0	10.0	0.0	0.0	8.5	7.2	1.4	0.0
West Bank	10.0	10.0	na	na	5.3	4.4	0.8	0.0
Gaza	-	-	-	-	3.3	2.7	0.5	0.0
2. Operating Investment Fund	10.0	10.0	na	na	12.3	10.5	1.8	0.0
West Bank	10.0	10.0	na	na	6.6	5.6	1.0	0.0
Gaza	-	-	-	-	5.8	4.9	0.8	0.0
3. Capital Investments	39.3		na	Na	8.5	0.0	1.2	7.3
West Bank	39.3	-	na	Na	3.5		0.5	3.0
Gaza	-	-	-	-	5.0		0.7	4.3
4. Technical Assistance	3.6	1.0	na	na	5.3	2.7	0.1	2.5
West Bank	3.6	1.0	na	na	2.8	1.3	0.1	1.5
Gaza	-	-	-	-	2.5	1.4	0.1	1.0
Total Project Cost	62.9	21.0	6.2	35.7	34.7	20.4	4.5	9.8
West Bank	62.9	21.0	6.2	35.7	18.2	11.3	2.4	4.5
Gaza					16.5	9.1	2.2	5.3

Note: totals may not add up due to rounding

Annex 3. Economic Costs and Benefits

1. The PAD distinguishes between Bethlehem and Hebron and gives a net present value (NPV) and an internal rate of return (IRR) for each. These results are not directly comparable to those of this ICR because the results of these two towns are, here, lumped together because of data collection constraints and availability. Nevertheless, the results stated in the project appraisal document (PAD) were overly optimistic when compared to those obtained in this ICR, as shown below:

Governorate	Economic	
	NPV (\$million)	IRR (%)
Bethlehem	3.13	31
Hebron	1.46	18

Source: PAD Annex 4 (NPV converted to US\$)

2. The assumptions made for the calculation of the NPV and the IRR are given in Table 1 of this annex. The results of the calculations are respectively \$1.4 million and 11%. As water tariffs were taken as proxy for economic benefits, these results are more a reflection of the level of tariffs than indicative of the worth of the project per se. Consumers' willingness to pay would have been a better measure but data are unfortunately not available.

3. The period of analysis is 25 years which is long enough to capture all the effects of the various components of the project, including technical assistance, reduction in unaccounted for water and growth in demand for water and sewerage services.

Table 1: Economic Analysis

	2000	2001	2002	2003	2004	2005	2006	2007	2008
Number of new water connections 1/	261	292	173	144	283	289	294	300	306
Number of new sewerage connections 2/	34	39	22	34	37	37	38	38	39
Connection fees- Average (NIS)	1,800	1,800	1,800	2,000	2,000	2,000	2,000	2,000	2,000
Total connection fees ('000 NIS)	531	596	351	356	640	652	664	677	690
Volume of water sold ('000 m3) 3/	2,165	2,376	2,440	2,399	2,744	2,771	2,799	2,827	2,855
Water tariff (NIS/m3) 4/	4	4	4	4	4	4	5	6	6
Water Sold ('000 NIS)	8,660	9,504	9,760	9,596	10,976	11,086	13,996	16,963	17,133
Other Revenues ('000 NIS) 5/	866	950	976	960	1,098	1,109	1,400	1,696	1,713
Total Revenues ('000 NIS)	10,057	11,050	11,087	10,912	12,714	12,846	16,059	19,336	19,536
Water Purchases ('000 NIS) 6/	9,104	9,038	10,999	9,908	11,579	11,695	11,812	11,930	12,049
Operation & Maintenance ('000 NIS) 7/	5,966	5,499	5,313	4,530	4,541	4,632	4,724	4,819	4,915
Total Costs ('000 NIS)	15,070	14,537	16,312	14,438	16,120	16,327	16,536	16,749	16,964
Net Revenue ('000 NIS)	-5,013	-3,487	-5,225	-3,526	-3,406	-3,480	-477	2,587	2,571

Table 1 continued

	2009	2010	2011	2012	2013	2014	2015	2016	2025
Number of new water connections 1/	312	319	325	325	325	325	325	325	325
Number of new sewerage connections 2/	39	39	40	40	40	40	40	40	40
Connection fees- Average (NIS)	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
Total connection fees ('000 NIS)	703	716	730	730	730	730	730	730	730
Volume of water sold ('000 m3) 3/	2,884	2,913	2,942	2,942	2,942	2,942	2,942	2,942	2,942
Water tariff (NIS/m3) 4/	6	6	7	7	7	7	7	7	7
Water Sold ('000 NIS)	17,304	17,477	20,594	20,594	20,594	20,594	20,594	20,594	20,594
Other Revenues ('000 NIS) 5/	1,730	1,748	2,059	2,059	2,059	2,059	2,059	2,059	2,059
Total Revenues ('000 NIS)	19,737	19,941	23,383						
Water Purchases ('000 NIS) 6/	12,170	12,291	12,414	12,414	12,414	12,414	12,414	12,414	12,414
Operation & Maintenance ('000 NIS) 7/	5,014	5,114	5,216	5,216	5,216	5,216	5,216	5,216	5,216
Total Costs ('000 NIS)	17,183	17,405	17,630						
Net Revenue ('000 NIS)	2,554	2,535	5,752	5,753	5,753	5,753	5,753	5,753	5,753
NPV (NIS million)	\$1.41								
IRR	11%								

- 1/ The number of water connection is assumed to increase by 2% per year after 2004 and stays constant after 2011 onwards
- 2/ The number of sewerage connections are assumed to increase at 1% per year after 2004 and stay constant after 2011 onwards
- 3/ The volume of water sold, which incorporates the extra water made available by the reduction in unaccounted for water, will increase by 1% after 2004 and remain constant after 2011 onwards
- 4/ Water tariffs are assumed to increase to 5 NIS/m3 in 2006, to 6 NIS/m3 in 2007 and to 7 NIS/m3 in 2001
- 5/ Other revenues are assumed to be 10% of water revenues throughout the life of the project
- 6/ Water purchases are assumed to increase by 1% after 2004 and remain constant after 2011 onwards
- 7/ Operation and maintenance costs are assumed to increase by 2% year after 2004 and remain constant after 2011 onwards.

Annex 4. Bank Inputs

(a) Missions:

Stage of Project Cycle	No. of Persons and Specialty (e.g. 2 Economists, 1 FMS, etc.)		Performance Rating		
	Month/Year	Count	Specialty	Implementation Progress	Development Objective
Identification/Preparation					
	07/1997	2	PRINC. PRIVATE SECT. DVPT SPECIALIST/TTL (1); SR SANITARY ENGINEER (1)		
	11/1997	3	PRINC. PRIVATE SECT. DVPT SPECIALIST/TTL (1); SR SANITARY ENGINEER (1); FINANCIAL SPECIALIST (1)		
	03/1998	5	PRINC. PRIVATE SECT. DVPT SPECIALIST/TTL (1); SR SANITARY ENGINEER (1); FINANCIAL SPECIALIST (1); WS&S ENGINEER (1); CONSULTANT (1)		
	05/1998	4	PRINC. PRIVATE SECT. DVPT SPECIALIST/TTL (1); FINANCIAL SPECIALIST (1); LEGAL ADVISOR (1); UTILITY SPECIALIST (1)		
Appraisal/Negotiation					
	11/1998	8	PRINC. PRIVATE SECT. DVPT SPECIALIST/TTL (1); SR SANITARY ENGINEER (1); FINANC. SPEC. (1); SR SANITARY ENGINEER (1); LEGAL ADVISOR (1); UTILITY SPECIALIST (1); ECONOMIST (1); PROCUREMENT OFFICER (1); WS&S ENGINEER (1)		
	11-12/1998	5	PRINC. PRIVATE SECT. DVPT SPECIALIST/TTL (1); CHIEF COUNSEL (1); FINANC. SPEC. (1); WS&S ENGINEER (1); ECONOMIST (1)		
Supervision					
	10/28/1999	4	MSSN LDR/FIN.ANLST. (1); SANITARY ENG. (1); SENIOR FIN. MMGT. SPCL. (1); OPER. OFFICER (1)	S	S
	01/27/2000	3	SECTOR MANAGER (1); FINANCIAL ANALYST (1); SANITARY ENGINEER (1)	S	S

ICR	08/14/2000	3	SECTOR MANAGER (1); FINANCIAL ANALYST (1); SANITARY ENGINEER (1)	S	S
	06/02/2001	2	FINANCIAL ANALYST (1); SANITARY ENGINEER (1)	S	S
	06/14/2002	2	FINANCIAL ANALYST (1); ECONOMIST (1)	S	S
	10/30/2002	2	FINANCIAL ANALYST/TTL (1); ECONOMIST (1)	S	S
	03/19/2004	6	FIN. ANALYST/TTL (1); PROGRAM ASSISTANT (2); OPERATIONS OFFICER (2); PROCUREMENT SPECIALIST (1); LEGAL EXPERT (1)	S	
	10/29/2005	4	FIN. ANALYST/TTL (1); WATER AND SANITATION SPECIALIST (1); OPERATIONS OFFICER (1); PROCUREMENT SPECIALIST (1);		
	12/2005	6	FIN. ANALYST/TTL (1); WATER AND SANITATION SPECIALIST (1); OPERATIONS OFFICER (1); PROCUREMENT SPECIALIST (2); PROGRAM ASSISTANT (1)		

(b) Staff:

Stage of Project Cycle	Actual/Latest Estimate	
	No. Staff weeks	US\$ ('000)
Identification/Preparation	65.25	261
Appraisal/Negotiation	Included above	Included above
Supervision	127	508
ICR	6.25	25
Total	198.5	794

Note: BB funds only. Staff weeks calculated based on an average staff week cost of US\$4,000

Annex 5. Ratings for Achievement of Objectives/Outputs of Components

(H=High, SU=Substantial, M=Modest, N=Negligible, NA=Not Applicable)

	<u>Rating</u>				
<input type="checkbox"/> <i>Macro policies</i>	<input type="radio"/> H	<input type="radio"/> SU	<input type="radio"/> M	<input type="radio"/> N	<input checked="" type="radio"/> NA
<input checked="" type="checkbox"/> <i>Sector Policies</i>	<input type="radio"/> H	<input type="radio"/> SU	<input type="radio"/> M	<input checked="" type="radio"/> N	<input type="radio"/> NA
<input checked="" type="checkbox"/> <i>Physical</i>	<input type="radio"/> H	<input type="radio"/> SU	<input checked="" type="radio"/> M	<input type="radio"/> N	<input type="radio"/> NA
<input checked="" type="checkbox"/> <i>Financial</i>	<input type="radio"/> H	<input type="radio"/> SU	<input type="radio"/> M	<input checked="" type="radio"/> N	<input type="radio"/> NA
<input checked="" type="checkbox"/> <i>Institutional Development</i>	<input type="radio"/> H	<input type="radio"/> SU	<input checked="" type="radio"/> M	<input type="radio"/> N	<input type="radio"/> NA
<input type="checkbox"/> <i>Environmental</i>	<input type="radio"/> H	<input type="radio"/> SU	<input type="radio"/> M	<input type="radio"/> N	<input checked="" type="radio"/> NA
<i>Social</i>					
<input type="checkbox"/> <i>Poverty Reduction</i>	<input type="radio"/> H	<input type="radio"/> SU	<input type="radio"/> M	<input type="radio"/> N	<input checked="" type="radio"/> NA
<input type="checkbox"/> <i>Gender</i>	<input type="radio"/> H	<input type="radio"/> SU	<input type="radio"/> M	<input type="radio"/> N	<input checked="" type="radio"/> NA
<input type="checkbox"/> <i>Other (Please specify)</i>	<input type="radio"/> H	<input type="radio"/> SU	<input type="radio"/> M	<input type="radio"/> N	<input checked="" type="radio"/> NA
<input checked="" type="checkbox"/> <i>Private sector development</i>	<input type="radio"/> H	<input type="radio"/> SU	<input type="radio"/> M	<input checked="" type="radio"/> N	<input type="radio"/> NA
<input checked="" type="checkbox"/> <i>Public sector management</i>	<input type="radio"/> H	<input type="radio"/> SU	<input type="radio"/> M	<input checked="" type="radio"/> N	<input type="radio"/> NA
<input type="checkbox"/> <i>Other (Please specify)</i>	<input type="radio"/> H	<input type="radio"/> SU	<input type="radio"/> M	<input type="radio"/> N	<input checked="" type="radio"/> NA

Annex 6. Ratings of Bank and Borrower Performance

(HS=Highly Satisfactory, S=Satisfactory, U=Unsatisfactory, HU=Highly Unsatisfactory)

6.1 Bank performance

Rating

- | | | | | |
|---|--------------------------|------------------------------------|-------------------------|--------------------------|
| <input checked="" type="checkbox"/> Lending | <input type="radio"/> HS | <input checked="" type="radio"/> S | <input type="radio"/> U | <input type="radio"/> HU |
| <input checked="" type="checkbox"/> Supervision | <input type="radio"/> HS | <input checked="" type="radio"/> S | <input type="radio"/> U | <input type="radio"/> HU |
| <input checked="" type="checkbox"/> Overall | <input type="radio"/> HS | <input checked="" type="radio"/> S | <input type="radio"/> U | <input type="radio"/> HU |

6.2 Borrower performance

Rating

- | | | | | |
|---|--------------------------|------------------------------------|-------------------------|--------------------------|
| <input checked="" type="checkbox"/> Preparation | <input type="radio"/> HS | <input checked="" type="radio"/> S | <input type="radio"/> U | <input type="radio"/> HU |
| <input checked="" type="checkbox"/> Government implementation performance | <input type="radio"/> HS | <input checked="" type="radio"/> S | <input type="radio"/> U | <input type="radio"/> HU |
| <input checked="" type="checkbox"/> Implementation agency performance | <input type="radio"/> HS | <input checked="" type="radio"/> S | <input type="radio"/> U | <input type="radio"/> HU |
| <input checked="" type="checkbox"/> Overall | <input type="radio"/> HS | <input checked="" type="radio"/> S | <input type="radio"/> U | <input type="radio"/> HU |

Annex 7. List of Supporting Documents

1. MC Audit Reports, Deloitte and Touche, dated March 2001 and December 2005.
2. Various PMU reports on performance and budgets.
3. Project Completion Report, PMU Gaza.
4. *Water Sector Institutional Capacity Building Program, Statement of Works*, USAID, undated document received from PMU.
5. Bank supervision report and project status reports throughout the project implementation period.

Additional Annex 8. Borrower's Implementation Completion Report

The Palestinian National Authority

SOUTHERN AREA WATER

AND

SANITATION IMPROVEMENT PROJECT

Implementation Completion Report

(Borrower's Contribution)

By

The Project Management Unit (West Bank)

November 2005

1. ABSTRACT

In pursuit of creating a sustainable water sector, the Palestinian Water Authority has made its strategic decision to increase the efficiency of the sector by moving at three different levels in the water sector. The first level is the one assumed by the Palestinian Water Authority being the Regulator and overall supervisor of the sector. The Bulk Utility is the second level where such entity provides its services at the bulk level; and the Regional Utilities will be at the third level. The water industry is characterized as being “fragmented”. Water departments within each municipality and village council operates and maintains the water system within their service areas. The customers are not satisfied with the inadequate water supply, deterioration of water quality and inadequate level of services. Therefore, and in order to create a more efficient and sustainable sector, the PWA has adopted the strategy of creating Regional utilities. The first attempt was in 1996 in Gaza Strip, and based on the Gaza experience, the Palestinian Water Authority has launched its second project in the southern area of the West Bank; and an international operator was invited to implement the project in Bethlehem and Hebron Governorates. This report, Implementation Completion Report, is set to explain the implementation of the project and highlights the main lesson learnt from such project.

2. BACKGROUND

On April 1995, the Palestinian Water Authority was established by a Presidential Decree 90/1995 with the primary objective of providing Palestinians with potable water at an affordable prices. This role is carried out by the PWA under its capacity as the Regulator and overall supervisor of the water/wastewater sector. The challenge that faces the PWA is how to ensure the continuation and the fulfillment of such mission at a time when the external funding and support diminishes in time.

In order to accomplish such task, the primary strategic plan for the PWA became one of building a sustainable sector. accordingly, the PWA believes that in order to have a sustainable water/wastewater sector, the institutional arrangement has to be re-structured and revised to guarantee the efficient and optimum utilization of the resources.

3. INSTITUTIONAL FRAMEWORK

During the time of establishment of the PWA, the water sector was served by three different types of institutions:

The West Bank Water Department (WBWD). The WBWD is generally responsible for delivering bulk water to utilities, municipalities or villages and the development, management and maintenance of transmission system and some local networks; and coordinates the transactions between Palestinian Water Utilities and the Israeli company Mekorot.

Water Department within local governments. Within the organizational structure of each local government, municipality or village council, there is a water department that tends to the water systems in the service area of that local government. The number and level of expertise of the people working in such departments varies. In small village councils, the "department" consists of a single clerk whose responsibility is the billing and collection, while the maintenance is conducted on need basis and is usually carried out by private contractors (plumbers). On the other hand, in the main municipalities, the water department consists of few engineers, technicians and administrative personnel and their tasks include all other municipal activities in addition to water.

Two sub-regional utilities. There are two sub-regional utilities in the West Bank and Gaza. The first is Jerusalem Water Undertaking (JWU) that was established to serve the Jerusalem District in addition to the cities of Ramallah, El-Bireh, Deir Debwan, Silwad, (Beitonia and Bier Zeit as bulk water supply) and

currently some forty villages and refugee camps. The second is in Bethlehem District and is called the Water and Supply and Sewerage Authority (WSSA); it serves the cities of Bethlehem, Beit Jala, Beit Sahour and a number of villages and three refugee camps.

4. The REFORMED SECTOR

The strategic plan for the PWA is to reform the institutional arrangement at the following three levels:

The Regulator. The PWA will concentrate more on its role as the Regulator and overall supervisor of the sector. The task will be carried out at two different levels; economic and environmental. At the economic level, the PWA is responsible to establish and regulate the water tariff, since its mission is to provide potable water at an affordable price. Many municipalities fail to cover the basic costs of their operation and maintenance. It is the belief that the tariff structure once approved by the National Water Council would assist the various institutions working in the water sector to cover their full cost. At the environmental level, the PWA would be monitoring the sector in a try to protect the resources from pollution and depletion. As part of the PWA's policy elements, the polluter is to pay.

The second level in the reformed institutional arrangement is the **Bulk Utility** that is basically a continuation to the present functions of the West Bank Water Department but in a more efficient manner through reforming and restructuring the organization. The PWA will be seeking to secure additional quantities of water by the drilling of new wells, as well the construction and maintaining of the main trunks to carry water among the different Palestinian communities taking into consideration the integration of the water systems between the West Bank and Gaza.

The third level in the reformed institutional arrangement is the **Regional Utilities**. As mentioned above there will be four regional utilities providing the Palestinians with the needed services. The first regional utility would be in Gaza, and the other three would be established in the West Bank (North, Central and South). It should be noted that the water resources would not be privatized, but the services may. The private sector would be solicited to operate the systems, but its performance would be monitored by the asset holders (Board of Directors) as well the Regulator (PWA).

5. MANAGEMENT CONTRACT

In order to establish such regional utilities, the PWA has sought the assistance of the World Bank. The beginning was in Gaza in 1996. The idea of the management contract was lucrative to the Palestinian Authority as well as to the international consultants and operators. The primary advantage of such type of contract is its flexibility and low risk to the Palestinian Authority. In addition, the contract is relatively short term and the PA retains access to soft loans for financing. As a result of being flexible with low risk, such solution became appealing to the consultant who became the Operator of the system.

The primary objectives of the management contract are:

- a. Improving the Quantity of water supplied to the end users through the increase in the efficiency of the water supply distribution system, and the improvement in the efficiency of the water supply and wastewater system operating equipment.
- b. Improving the Quality of the water provided to the communities. This can be attained by improving the quality of water supplied through disinfection and other appropriate measures. In addition, the quality of the wastewater effluent would be improved to ensure the protection of the aquifer.
- c. Improving the management of the water and wastewater systems. In order to reach such goal, the operator would assist in improving the efficiency of revenue collection, improve the operations of water

and wastewater systems as well as improve the efficiency of customer service and public relations.

- d. Improving the institutional aspects of the water and wastewater systems. This is carried out by improving the effectiveness of the management of the systems, improving the long range performance of the systems and preparing and assisting in the identification of the investment projects.

6. DESIGN OF THE SOUTHERN AREA PROJECT

Due to the progress and improvement in the efficiency of the water and wastewater services in Gaza, the PA sought the assistance of the World Bank. The Bank has allocated the needed funds to launch the second performance based management, the new project concentrate on the southern area of the West Bank; namely Bethlehem and Hebron Governorates. The structure of the management contract is the same as the one in Gaza, and includes fixed fees, incentive fees as well as the operating investment fund. However, the scope of work to carry out in both Governorates was different.

In Bethlehem Governorate, and since we there is a sub-regional utility (WSSA), the international operator was required to carry out a full operation and management of the system. The WSSA employees would be seconded to the operator, and the different tasks would be carried out under the direct supervision of the operator. The next step, after improving the water and wastewater system in the service area of WSSA, would be to expand the service area to include more communities in the Governorate, and transforming the utility into one of regional utility.

In Hebron Governorate, the situation is slightly different since the services are provided by the water departments within the local governments. Therefore, the international operator would be required to review the system and provide technical advice as well as train the engineers and technician to carry out their day to day operations and maintenance tasks.

The Project

Summary Project Scope and Objectives

The development objectives of the project are to:

- a. Improve the sufficiency of water and wastewater services and the efficiency of their supply to customers in terms of quality, quantity and management by building on existing authorities – the Water Supply and Sewerage Authority (WSSA) for Bethlehem Governorate (BG) and the municipal water departments within Hebron Governorate (HG).
- b. Prepare for and implement an appropriate institutional framework for water and wastewater service provision including the implementation of a performance-based management contract (MC) and building regulatory and institutional capacity in the Palestinian Water Authority (PWA).

The Contract (US\$ 21 million)

The basic goals to be pursued under the Management Contract (MC) are to improve the quality and quantity of water supplied and the management of the water and wastewater systems in Bethlehem and Hebron Governorates.

As compensation for the delivery of services described under the MC, the Operator was paid a fee consisting of two parts: a Management Fixed fee and an incentive fee based upon the attainment of specified performance goals. The management fixed fee is a base fee that was paid to provide for

mobilization and operating costs during the period of the contract and finance necessary staff to implement the four year Service Improvement Program. The performance incentive fee with a ceiling of US\$2.0 million was paid for the operator at the end of each year based on the operator' s performance and the targets achieved. The actual amount of the incentive fee received by the Operator depended on the extent of the achievement of performance targets specified. The maximum amount of incentive fee that can be paid annually was equal to US\$500,000.

Operating Investment Fund (US\$ 10.0 million). This Fund is established to provide immediate funds for the purchase of materials, supply and equipment necessary to

- (a) rehabilitate water and wastewater infrastructure in both BG and HG.
- (b) enhance the efficient operation, maintenance and administration of the water and wastewater systems in BG and BH.

The Operator will procure works and services on behalf of PWA based on the Annual Procurement Plan which will submit to PMU for approval.

Technical Assistance (US\$ 1.0 million). A program of TA is included under the project financed partly by the World Bank and the European Investment Bank and includes:

- a. provision to establish and support a Project Management Unit (PMU) to facilitate implementation of the project;
- b. provide independent consultants to audit the operator's technical and financial performance and recommend performance incentive payments.
- c. consultants to carry out semi-annual financial audit of project funds; and
- d. provide resources for training, study tours and studies to improve the institutional capacity of the PWA and related staff presently, in the municipalities.

The PMU was responsible for coordinating and managing all project related activities i.e. management contract, operating and capital investments. The PMU will report and act on behalf of the Head of the PWA in dealing with the operator, donors, Municipalities, and other PA Ministries, related to the project.

Implementation Arrangements

The project was implemented mainly by the PWA's project management Unit, and the unit reports directly to the Head of the PWA. The PWA will have overall responsibility for project coordination. However, the project oversight and policy guidance will be done through the coordination committee. The Coordination Committee (CC) was established and was responsible for overseeing and guiding the activities of the Operator. This committee is made up of the following institute representatives:

Representative	Institution
Eng. Fadel Ka'wash – Chairman	Palestinian Water Authority
Dr. Hussein Al-Araj	Ministry of Local Government
Mr. Adnan Abu Ayyash	Ministry of Housing
Mr. Basil Ramahi	Ministry of Finance
Mr. Khalil Najim	Ministry of Planning
Mr. Mustafa Natshah	Mayor of Hebron
Mr. Hanna Naser	Mayor of Bethlehem
Dr. Alfred abed Rabbo	Bethlehem University
Mr. Khalid Osaily	Private Sector-Hebron
Mr. Daoud Al-Zeer	Private Sector-Bethlehem

The CC was envisioned to become the Board of the future regional utility. This committee is chaired by PWA with representation from WSSA, the municipality of Hebron, the Ministry of Finance, the private sector and other stakeholders

Special conditions and circumstances

The contract was signed with the French company, General des Eaux, who had a Palestinian firm Khatib & Alami, and together the operator came to be known as GEKA. The team mobilized on September 1999 to take the WSSA offices as their headquarters. Another, smaller office was opened in Halhul to run the projects for Hebron Governorate. The contract continued for one full year, and by the end of the first year, the Intifada started and the works were derailed.

The second contractual year which started on September 1 2000 was divided into two phases; the Force Majeure period which lasted until the end of year 2000, and the Transition period which started on January 1 2001 and ended on August 31 2001. During that year the different parties agreed to compensate the Operator for the works and services that were provided during that year; and contract amendment was made to reflect that agreement.

At the start of the third contract year, 1 September 2001, it was assumed that the work would again be honored according to the requirements of the original Management Contract in one way or another (i.e. that the Transition Period ended 31 August 2001). On 4 September 2001, GEKA, declared its willingness to

continue on that basis, provided that a “Tentative Work Plan” should be used as the basis. In its reporting during the consecutive months, GEKA compared its achievements against this plan. However, no formal approval was given by PWA to this change of the contract.

On 4 April 2002, the situation became so difficult that GEKA declared Force Majeure.

Later correspondence states that the Operator was willing to continue on an incentive based contract. In their letter of 15 May 2002, GEKA wrote that “we hereby confirm our willingness to proceed, whenever the present situation allows, with a revised version of the Contract closer to the needs of a future utility and better adapted to the likely unstable prevailing situation”. No formal agreement between the parties was entered into on this basis.

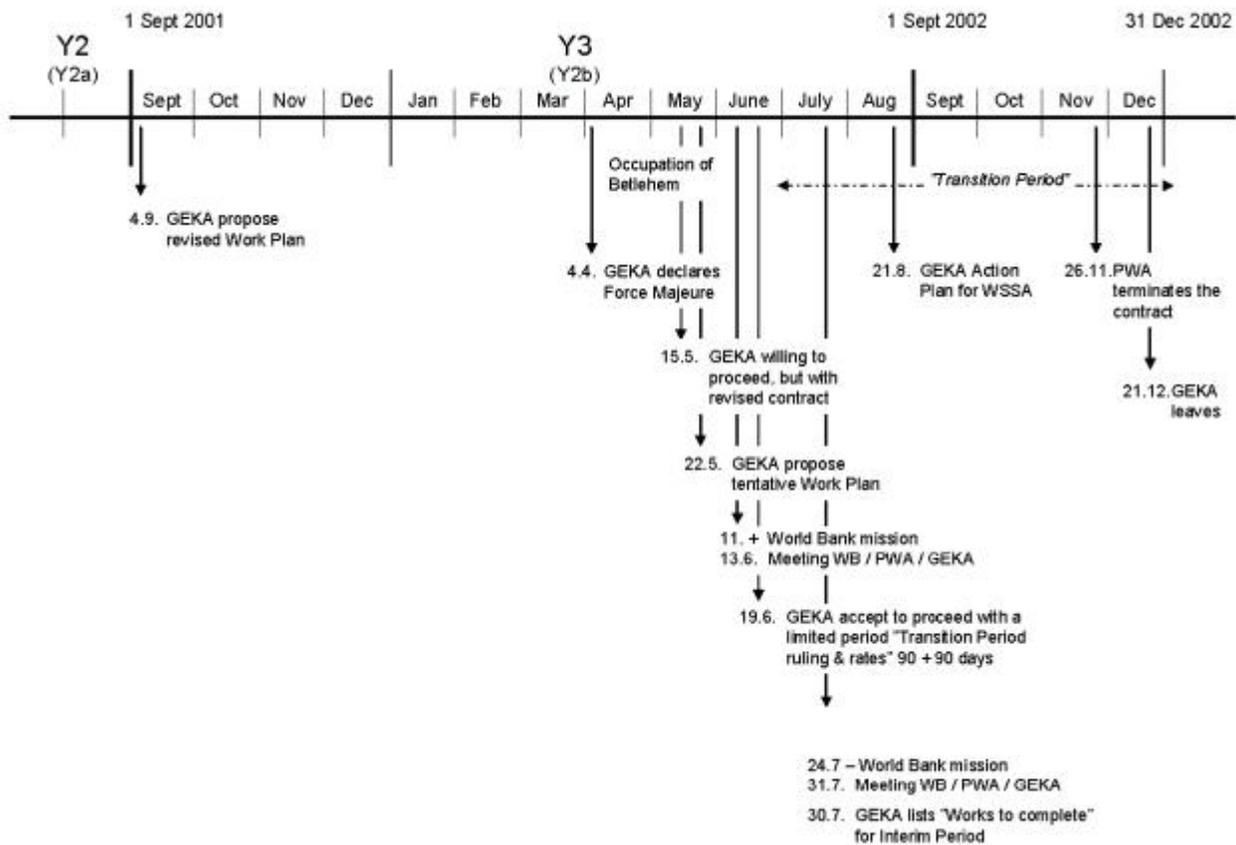
By June of 2002, it was evident that the continuation of the contract would not be in the best interest of the three parties. GEKA could not fulfill the set targets, and hence will not be able to achieve the desired bonus. For the PWA and the World Bank it meant the continuation of the depletion of the financial resources at the time where no one would reach the set targets. Accordingly, GEKA's contract was terminated, and the operator left the country by the end of 2002. In the meantime, the PMU took over the implementation of the contract and worked with the different communities to improve the services.

The process could be illustrated as follows (as demonstrated in the auditor's report):

The Role of PMU

The Project management Unit was established on September 1999 to follow up the implementation of the World Bank funded project (SAWSIP) as well as the implementation of the European Investment Bank Capital Investment program that included 5 schemes with a total value of 30 million Euro. It should be noted that all other programs that are designed and implemented in the southern area of the West Bank would be done through the PMU and that includes the World Bank funded Emergency Water Program, and other USAID funded projects that are described below. The total investment packages that have been implemented through the PMU come close to 228.5 million USD. Those programs include:

Eastern Hebron Bulk Water Supply Project: The Bani Naim project is designed to connect to the previously constructed Halhoul reservoir and the planned Yatta reservoir through a pipeline, supplying an additional 320 m³/hour to the water provided to the southern West Bank. The work includes the construction of two booster stations and approximately 35 km of pipelines, providing well pumping facilities for two wells as well as providing permanent power in the southeastern part of the West Bank. The cost of such works is estimated at 30 million USD



Hebron Wastewater Treatment Plant: Beginning in mid 2006, USAID plans to finance the construction of a regional Wastewater Treatment plant in the south Hebron area. The construction of a phased 15,000 m³/day wastewater treatment plant includes a pre-treatment facility in the Hebron industrial area to screen the wastewater from the municipality of Hebron, a conveyance pipeline south approximately 6.5 kilometers from the industrial area to the main treatment plant, and the operation and maintenance training on that plant for a period of 2 years. Included in the phased construction programs will be the conveyance pipeline, wastewater treatment facilities, reuse storage and distribution programs, and a solid waste landfill expansion project. The allocated budget for this project is 50 million USD.

Small Water Infrastructure Fast Track: The newly awarded SWIFT II project will implement demonstration projects for the rapid, reliable development of local infrastructure. In specific, the purpose of those programs is to assess access to water and sanitation services, repair critical water and sanitation systems, and procure materials and equipment required for immediate repair of water and wastewater systems in the West Bank and Gaza. The allocated budget is 7.5 million USD.

Aqraba-Rujeib Water Supply Program: This soon to be awarded program is a two-year initiative to provide safe and sustainable water and sanitation services to at least 40,000 people in a cluster of 10 villages southeast of Nablus in the West Bank. Activities under this program will include equipping a newly developed well and providing pumps, storage tanks, transmission lines, and household distribution

systems. Engineering designs, institutional planning, and environmental assessments were developed by Camp, Dresser, and McKee under the Environmental Health Program IQC and through the Water Resources Program Phase 3 contract to CH2MHill. The selected contractor will furnish all labor, materials, equipment and incidentals required to construct the specified water distribution systems in its entirety as has been designed. The construction specified as the Awarta Booster Station will depend on the quantity and quality of water produced by the well to be drilled and tested at the Rujeib Well and Booster Station. The capacity of this booster station including pumping units must be confirmed by the Engineer prior to construction. Depending upon the capacity of the Rujeib Well, benefiting villages are expected to consist of Awarta, Osarin, Aqraba, Majdal Bani Fadel, Duma, Qusra, Jurish, Jalud, Qaryut and Talfit. The WIC contractor will be expected to work closely with the Construction Management Contractor, PWA, and relevant village councils to develop a Joint Services Council (JSC) responsible for operation and maintenance of the Rujeib Well and distribution network, to train the JSC staff in operations and maintenance procedures, and to develop a system of billing and collection to sustainably finance this water system. The estimated budget for this project is expected to be around 18 million USD.

Emergency Water Operations Center was created by USAID in April 2002 in partnership with the Palestinian Water Authority and NGOs in response to the humanitarian crisis that evolved during military incursions in the West Bank and Gaza. Damage to water and electrical infrastructure resulted in disruption of water delivery to hundreds of thousands of Palestinians. In response EWOC trucked water to hard-hit cities and rural communities, repaired and replaced damaged pipes, and provided new generators and pumps. EWOC activities included conducting needs assessments, designing replacement systems, and overseeing the repair of wells and the installation of new water filling stations. EWOC developed a water preparedness program for the West Bank to restore depleted stocks of spare parts and to develop emergency water management plans. USAID funded activities under EWOC expired in 2004 however the World Bank has provided funding to the Project Management Unit of the Palestinian Water Authority for additional activities through 2007. The budget is 9.5 million USD.

Bethlehem-Abu Dis Wastewater Collection, Treatment, and Reuse: Within the next year, USAID/West Bank and Gaza anticipates an award for the construction of a wastewater treatment plant (WWTP) as well as pumping stations and transmission pipelines needed to connect wastewater flows to the WWTP. It is likely that construction of treated water reuse systems in agricultural areas east of Bethlehem will be incorporated into this activity. A feasibility study must be completed before the full scope and geographical coverage area of this project can be determined. The WIC contractor will be expected to work closely with the Construction Management Contractor, PWA, Ministry of Agriculture, relevant municipal or JSC authorities and the private sector to develop appropriate institutional capacities to sustainably operate, maintain, and finance this facility. The estimated budget for this project comes at 50 million USD.

Institutional progress

Bethlehem Governorate

In Bethlehem Governorate, and since there is a sub-regional utility (WSSA), the international operator was required to carry out a full operation and management of the system. The WSSA employees were seconded to the operator, and the different tasks were carried out under the supervision of the operator. It was envisioned as a next step, after improving the water and wastewater system in the service area of WSSA, to expand the service area to include more communities in the Governorate, and transforming the utility into one.

The PMU worked in the villages of Bethlehem, outside the service area of the WSSA, and divided the

villages into three areas. Each area had its own Service Council. Two Joint Service Councils were officially declared; the Eastern JSC and Western JSC, and now the next target is the Southern JSC. The establishment of those JSC comes with the mutual understanding that they would be integrated to become part of the Southern regional utility. The PMU has been working with those JSC and supply them with the needed technical assistance, as well as the materials to increase the efficiency of their systems. At the WSSA, the PMU has worked during the presence of the operator, and after the termination of the contract to restructure the organization, and many tasks were achieved which include:

- An organizational structure was set for the WSSA, with a detailed job description for the senior positions at the organization
- Setting the scope of work for each of the departments of the new structure
- Putting together an evaluation report for the current staff prior to reallocating them based on the new structure
- Setting standard operating procedures for the technical operations
- Evaluating, and for the first time, the value of the organizational assets
- Setting a new billing and collection system and continue to providing the WSSA with the needed technical assistant
- Setting a new accounting system and provide the needed training and continue with the technical assistant
- Setting up a financial and procurement procedures and follow up their implementation
- Setting up a new payroll

Hebron Governorate

In Hebron Governorate, the situation is slightly different since the services are provided by the water departments within the local governments. Therefore, the international operator would be required to review the system and provide technical advice as well as train the engineers and technician to carry out their day to day operations and maintenance tasks.

In order to facilitate the work of the international operator in Hebron Governorate, the area was divided into five centers based on the population size in each of those sectors. The PWA with the operator have held a series of meetings with the mayors and chief engineers in each of those sectors at which the objectives of the establishment of those sectors was explained. It was clear to everyone that the operator, with the assistance of PWA, would establish technical centers at each sector with the ultimate objective of integrating them all into one regional utility.

It should be noted that an assessment study was commissioned by the Environmental Health Project (EHP) and carried out by American Near East Refugee Aid (ANERA), detailing the institutional and financial feasibility of establishing a set of Joint Services Councils (JSC) for water and wastewater in the West Bank Governorates of Hebron. The proposed project was designed to provide safe and sustainable water and sanitation services to rural communities in the West Bank and is a component of the USAID Village Water and Sanitation Program (VWS).

ANERA's assessment concerns a variety of important and related issues including local organization, infrastructure, governance, geographical location and established patterns of water and sanitation systems use.

Some of the general findings from the study are as follows:

- Despite significant variation in the infrastructure, economy and population of the clusters designated for the purposes of this study, the representatives of all clusters expressed strong support for establishing JSCs.
- The village councils are currently responsible for managing the existing water networks within their villages. The proposed JSCs would have to assume responsibility for the management of the new water networks for the foreseeable future. None of the village councils in the Governorate expressed any objection to having the JSC take over such a management function.
- Some of the features characteristics of the communities that have existing water systems include the debts that are accumulating from non-payment for bulk water by the village/town councils.

Accordingly, a PMU coordinator was nominated to work with each center, and was required to provide the technical assistant that are needed by the different communities. The PMU coordinator would be working with the different local government authorities trying to identify their needs of projects, equipment and materials. The management of the PMU would then study those requests and make the decision regarding those requests. If the projects are approved, then the community would required to provide the manpower for the installation where the PMU would be providing the material and the supervision. Such work has proved to be the ideal way since it has empowered those communities and increased their sense of ownership.

Lessons learned

1. The Management Contract format has proven to be the proper format to protect the interests of the different parties. The PWA and the Bank are guaranteed to receive the desired services from the operator at the agreed contract prices. The operator's interests are protected and the operator's risk is minimized under the more challenging circumstances, and this was the case during the years of the Intifada and the military incursions.
2. The formation of the PMU needs to be structured with greater attention, based on the assigned tasks. During the course of its function, the PMU has proven to be the entity that can assume the same responsibilities as those of the "operator", and with some modification and the technical support, the work would be carried out in a more professional manner. The original scope of work mandated that the PMU would coordinate with the communities and the donor community regarding the implementation of the different projects and the improvement of the services; and act the liaison between the different parties. However, this role was significantly changed after the Intifada and the declaration of the Force Mejeure by the operator. The PMU, after adding the local staff, who were part of the operator's team, started acting as the operator of the sector; and additional tasks were assumed by the team including the procurement services, supervising the operation and maintenance of the WSSA, providing technical assistance to the different communities and continue its role in the donor coordination in the southern area of the West Bank.
3. The institutional arrangement should be handled from the early stages of the program. It was found that the operator would carry out and concentrate more on those technical issue that would generate additional revenue in the bonus, and would push back the implementation of those tasks that have no incentive such as the restructuring of the of the organization, training, health plans and emergency plans. This was evident in the report of the auditors for the first year where they sited 26 different tasks from the service appendix that GEKA did not report on their implementation (attached is the list)
4. Incentive bonus that is used to pay the municipal engineers and technical people, for the additional tasks, should be thought and structured in a more careful manner. The bonus that was paid for the

local municipal engineers and technical individuals did more harm than good. Many of the local engineers were looking at the bonus as their "right" and were threatening to halt work unless the bonus is paid first, and they have failed that they were paid the bonus for the extra work on top of their salary. The bonus system should have been part of the restructuring of the organization with its by laws and regulations, and should not be paid on monthly basis but should be based on a well known system

5. Training should be looked upon seriously and should carry some weight. The operator would find the easy way out of doing its work, and would hire extra help to do its work rather than work more intensely with the existing labor force and carry out the needed training. It suffices to say that no training was conducted by the operator, and only a modest attempt was made to do a needs assessment as a first step in preparing the training program
6. Incentive bonus for the operator should be revisited. The operator starts to work to achieve the tasks that would create more bonus, and neglect those that have no bonus attached to them. As mentioned earlier many tasks were not reported to have achieved any progress due to the simple fact that the operator would not benefit at the end of the contractual year after the auditors would start their scoring at set the bonus level
7. The area of the service differs from one place to another, and the area of the West Bank area is larger than Gaza. Accordingly, this fact should be studied carefully when setting the budget of the projects, the needed services and the size of the PMU. The proper size of the manpower and the level of investment needed are the prerequisite for the success and failure of any program
8. The finances of the project should be used exclusively for the benefit of the project, and no funds, under any circumstances, should be reallocated to other projects outside the original scope of work of the project. The reallocation of a significant amount of funding, almost 50% of the budget, to Gaza project has not been a wise decision. Much of the funding that was reallocated to Gaza was paid for the operator (LEKA). The monthly fees were very high compared to the level of services that were required from the operator. Both projects, Gaza and the West Bank, could have benefited from the funds that were paid to the operator, if the Gaza PMU has carried out the work themselves. When the decision was made not to extend the contract of LEKA, and the PMU-Gaza team was required to carry out the work itself, almost 1.2 million USD were saved (in Gaza alone) and used to rehabilitate the system. Due to the fact that much of the funded was reallocated to Gaza, many of the works in the West Bank had to be canceled or reduced the scope. However, some of the urgent tasks and works were funded by other donors; namely the USAID and the AFD. Accordingly, many of the set objectives for the SAWSIP were met
9. The World Bank criteria for judging the performance of the program should be revisited and should not depend on the speed of spending the funds. The efficient allocation of the funds should be considered, especially when other donors are co-financing some of the projects in the same area.

Summary of Activities Implemented in Gaza with Financing from the Project

1. WATER NETWORK MAINTENANCE AND LEAK REPAIRS

Water network maintenance and repair program has been identified as a key task to be implemented in the Gaza Strip municipalities as part of the scope of work of the Service Improvement Project's Extension and Interim Emergency Program (IEP). Leak repairs contribute to the reduction of physical losses in the water distribution systems starting from the water source down to the customer connections.

More than **2500** network maintenance and leak repair jobs were performed during the SIP extension and IEP starting from November 2000 to the end of October 2004, out of those, **1750** repairs were for pipes 50 mm and above. The network repair program has significantly contributed to the reduction of physical water losses.

The following activities have been carried out by PWA team to perform a comprehensive leak repair program:

1. In order to track network repairs in Gaza Strip municipalities, the standard reporting format which was introduced to the municipal staff previously has been activated and followed up. Database which was created provides historical information on the number of repairs, location, material, pipe size and type of burst.
2. Site visits were carried out for all municipalities of the Gaza Strip. The purpose of these visits is to maintain the needed momentum to carry out network maintenance activities and to identify the municipal needs during the interim period.
3. In order to improve the level of security and safety during the execution of water works in the Gaza Strip, a complete safety package was ordered under the contract NS 56-01. The safety package includes two categories: Road Safety Signs (Traffic Management) & Personal Safety & Protection Equipment. These tools and equipment have been issued to the municipalities according to the maintenance team number in each municipality.
4. In order to support the municipal water departments in carrying out the daily network repair and maintenance duties, various National Shopping contracts have been launched (see Financial Achievement Annex).

Impact of Israeli incursions:

- Repeated and frequent Israeli incursions to several areas in the Gaza strip called for prompt response to assist the intended municipalities. This assistance was responding to the Municipalities request for damage repairs and based on a damage assessment report prepared by both the PMU and the municipal staff.
- It is worth mentioning that, large quantities of repair materials were consumed during these repeated incursions.

Update of Water Networks Maps:

- This task was resumed as an integral part of leak detection & network repair task.

- Accurate & updated maps for water network are necessary for tracing the leakage location and supporting the municipal maintenance team in the repair and maintenance activities. An action plan was placed to finalize this task before the end of September 2004. This Task was completed by October 2004, where soft and hard copies of updated maps have been submitted to all Gaza strip municipalities.

2. OVERALL SYSTEM EFFICIENCY

It has been recognized in the SIP extension and the IEP, that reducing unaccounted for water in Gaza Strip is an important key task. The overall system efficiency is defined as the ratio between the volumes of water billed as recorded by the municipalities on a monthly basis and the volume of water produced from municipal, Mekorot and private sources like rented agricultural wells.

During the SIP extension and the IEP, efforts were exerted to keep sustainable system efficiency levels as they were achieved before. It is worth mentioning that some difficulties were experienced in receiving municipal reports. In several cases some incorrect meter readings and billing figures were reported. PWA task team in such cases performed additional cross checking exercise and extra refinements of the received data.

The following paragraphs summarize the efforts and initiatives taken to improve the overall system efficiency:

1. Water Network Maintenance and Leak Repairs:

This activity has been re-addressed strongly in order to maintain the reduction of physical water losses achieved during the SIP implementation and resulted from defects in the water networks.

Summary of Achievement

Definition Hydraulic Efficiency (%) = Total Consumption/ total Production, Where: total consumption is consumption in m³ within the defined period.
The total consumption should be the "metered consumption in m³ within the referenced period.

Justification Monthly overall system efficiency report that includes:
-Monthly Consumption statements from the municipalities.
-Monthly Production statements from the municipalities.

Executive Summary:

Sustainable status of system efficiency has been achieved during the course of the Interim Emergency Program (IEP). Unfortunately, no progress achieved during the same period. Due to several severe pipe bursts resulted from the Israeli frequent incursions. Leak repairs could not be carried out promptly since access to concerned sites was denied. **63.68 %** overall system efficiency of the Interim Emergency Program period (Nov.2003 – Oct.2004). A sustainable level of system efficiency is mainly attributed to three factors: resuming the activity of the Meter Reading Auditing program, leaks repair program and the meters replacement program.

Significant reductions in the unaccounted for water can still be achieved by regularizing illegal

connections. The municipalities and PWA should define a clear policy regarding this issue.

3. Meters Replacement:

The meter installation program was extended to cover non-metered buildings including hospitals, schools, mosques, parks, administrative (public) buildings, etc in addition to the regular domestic blocked meters replacement program.

During the period of Interim Emergency Program, **7366** domestic and **128** public building meters have been replaced and installed. It is considered that the meter installation program had significantly contributed to the reduction of metering losses.

3.1. Procurement of water meters

Due to the limited budget assigned for the metering tasks in this Interim Emergency Program we decided to purchase a relatively small number of water meters.

An international shopping contract (IS 01-17) was launched to purchase **3000** meters of dry type only of 3/4 inch size.

The contract was awarded to an Israeli Company (Arad Co.) with a price of 20 USD for each meters.

The water meters fulfill the requirements of our contract and they also meet the specifications of the international standards (IS 4064).

Summary of Achievement

Definition: Replacement of damaged meters for both domestic and public buildings

Justification: SIP Extension and IEP agreement.
Monthly reports of replaced meters
Meter replacement data base.

Executive Summary:

One of the main tasks which is necessary to increase the overall hydraulic efficiency is the replacement of Water Meters

The aim of this Task was to replace water meters for both domestic and public buildings. Whereas, the replacement of domestic meters was carried out by the municipality plumbers, and the replacement of meters for public building was mainly carried out by a local contractor.

A national shopping contract (**NS 06 16**) was awarded under number to a local contractor to replace **70** water meters of different sizes for different public buildings in some municipalities as shown hereafter.

During the execution of domestic meter replacement, the municipality plumbers replaced also **58** meters for public buildings where possible.

The total achievement of this task as follows:

- 1- Replacement of **7366** domestic water meter.
- 2- Replacement of **128** meters for public buildings.

4. Municipal Water Meters Repair

4.1 Repair of Water Meters for Municipal Wells

The blocked meters of municipal wells were transferred from all municipalities to PWA store in order to be repaired, recalibrated and reinstalled for the water wells throughout launching a direct contract (**DC 16-21**) with a local workshop.

4.2 Repair of Domestic Meters

It was intended to continue the meter repair and recalibration program, which has started during the SIP project. In the original target of the task was to repair and recalibrate domestic and municipal meters.

It was found that the repair of domestic meters was not feasible where the repair costs 16 USD for each meter while the price of new meter is about 20 USD, knowing that the life time of repaired meter was much less than a new meter.

For the above, it was decided to abandon the repair of domestic meter. All defected meters existing in PWA stores were sold in a public auction. The repair work was only carried out for water meters of large sizes (6-inch& 8-inch) which are used for water wells in the Municipalities.

Summary of Achievement

Definition: Repair of Water Meters of Municipal Wells.

Justification: Meter Repair contracts
Repaired meters Reports that includes meter testing reports

Executive Summary:

The target of the task was to repair water meters of 6-inch and 8-inch sizes used for municipal water wells.

The meters were recalibrated and tested to meet the metrology standard for Class B meters mentioned in the **international standard IS 4064** where the percentage error should be within +/- 2% at transitional and nominal flow rate of the meter and also within +/-5% at minimum flow rate.

The total achievement is **38 wm** as following:

1. Repair 21 meters of 8-inch size
2. Repair 17 meters of 6-inch size

5. Meter Reading Auditing Program

In order to improve the existing meter reading service and to increase the reliability of the consumption figures, the audit exercise which was developed during the SIP implementation has been resumed in the second half of the IEP period and an auditing team was employed on the first of June 2004.

The following functions are performed as part of the auditing program:

1. Recognize and verify meter readings taken by the municipal meter readers and identify the gaps in the reading cycle.
2. Check out the meter readings and identify unread meters, particularly public buildings and large consumers.
3. Identify possible water consumptions that are unmeasured.
4. Identify all possible reasons for unaccounted for water including illegal water consumption.
5. Provide the municipal team with all assisting information, advice and follow up the implementation of the proposed programs.
6. Continuity of data flow from the municipalities to the PWA.

6. House Connections & Pipes Replacement Program

PWA has been working to improve the water services situation in Gaza Strip. Through the World Bank project (SIP), PWA has replaced about 330 km of distribution pipes in the previous three phases to minimize water losses from old pipes.

During the SIP extension and IEP, a 4th phase was launched for the replacement of about 40 km in some municipalities that reported lower system efficiencies all over Gaza Strip and mainly in Gaza city & Northern Gaza.

The project had been divided into three contracts of works and one of consultancy & supervision services as per the following list:

1. Gaza Area (NCB 42-28 & NCB 42-29),
2. Northern Area (NCB 42-30),
3. Consultancy service (C2S 42-27)

Summary of Achievement

Definition Replace house connections, distribution networks and installing new connections.

Justification Bid documents , Lists of the installed H.C, As built drawings

Achievement

1. **3396** service connection had been completed, and
2. **40,000 ml** of pipes · 50mm were installed

7. Improve Water Disinfection

7.1. Chlorine Delivery:

During the SIP extension and the IEP a total quantity of around **1600 M3** of Sodium Hypo-chlorite solution was supplied to the water installations in the Gaza Strip. The delivery was including also, Hydrochloric acid, Sodium Metabisulfite, caustic soda and Antiscale for the three brackish water desalination plants in Gaza Strip.

The provision of these chemicals to the desalination plants contributed significantly in the improvement of the water quality particularly in areas including Khan Younis and Deir Al Balah municipalities where the levels of Chloride and Nitrate in water are relatively high.

7.2. The regional storage and distribution stations:

Israeli military incursions have divided Gaza strip in several occasions into three isolated parts. This demonstrated serious threat on delivery schemes of chlorine and chemicals to the various water installations.

Contracts NCB 02-16 and NCB 02-16 preserved the three emergency storage and distribution stations. One in Gaza (serves Gaza city and the Northern Area), the second in the Middle area, and the third in KhanYounis (serves KhanYounis and Rafah). Each of them has a stock of three months supply of chlorine and chemical materials.

The regional storage and distribution stations were very helpful during road closure due to Israel military activities. This arrangement has solved the problem of chlorine shortage which could seriously affect the people public health.

7.3. Residual Chlorine Monitoring Program:

The monitoring program continues to be performed in all the municipalities on a regular basis using the Photometer test kit, which was available to health departments in each municipality. Consumables and reagents required to run the program were also available as planned in the standard disinfection procedure.

Tests and sampling are being carried out for free and total chlorine on a fixed identified number of sampling points (**445 sampling points**) selected carefully to be representative of the entire water distribution network. The results are available in the Program's Database, which is designed to establish a historical reference on this important task.

Due to managerial problems, some municipalities did not carry out the tests in certain months. Immediately, written notice was being sent to those municipality to rectify the gap and to resume the test process (refer to the monthly reports).

The results of the monitoring program had shown clearly that by the end of October 2004 that the disinfection efficiency is achieved in excellent manner a **100%**.

7.4. Chlorine Dosing Units –Spare parts and serviceability:

Since the chlorine dosing pumps are the main deriving tool of having proper and secured water disinfection, a great care has been made during the SIP extension and the IEP to keep stock of chlorine dosing units and essential spare parts and consumables at PWA stores. This was done under the task of water facilities

maintenance. PWA co-coordinators and the municipal chlorine technicians under the supervision of the task manager were responsible for implementing the delivery and repair procedures.

7.5. Calibration of chlorine photometers

Arrangement has been made to perform three months calibration and testing program for the 25 municipal testing kits to ensure accurate measurements for free chlorine.

The Task Manager used to perform such test on the presence of the municipal technician and PWA regional coordinator, and issued a calibration certificate identifying the range of uncertainty .Any set that has uncertainty level outside the range specified by the manufacturer; has been taken out for repair and replaced by new calibrated kit.

Summary of Achievement

Definition Water disinfection efficiency (%) = (Total number of positive residual chlorine sampling points + total failures passed within 48 hours of the first sampling) / (total number of the measurable sampling points)

In addition, the following should be considered: (1) Re-calibrating the testing kits-each three months, and (2) the reading that comes within the uncertainty of the testing kit will be considered as failure.

Uncertainty of the kit is: ± 0.05 mg/Liter

Justification

- Chemicals procurement documents (tender and contract document)
- Monthly residual chlorine report for all municipalities.
- Monthly disinfection reports.

Target To maintain the disinfection efficiency at the same level achieved (99.8% average 12 months providing that the total failures to pass within 48 hours doesn't exceed 2%)

Executive Summary:

During this period, an excellent average disinfection efficiency of the municipal water networks was achieved and **100 %** of the tested monthly samples showed positive results. The total number of samples is **445**.

NCB contracts have been launched to secure the delivery of all treatment materials. They cover the disinfection chemicals of Sodium hypo-chlorite (for about 105 water wells and reservoirs) and other chemicals required for the water treatment at three desalination plants. A total quantity of around **1600 M3** of Sodium Hypo-chlorite solution was supplied to the water installations in the Gaza Strip

8. Operation and Maintenance of Wastewater Systems:

The Wastewater treatment plant systems currently in operation in Gaza Strip are three, in the Northern Cities, in Gaza City and in Rafah City. The other areas (Khanyounis and the Middle Camps) have no system yet. During the SIP extension and the IEP, PWA's PMU has continued to assist those three WWTPs throughout the following main activities:

8.1. Operating of Wastewater Facilities

- Supervise the daily routine operational activities and provide the needed technical and managerial assistant through periodic visits to the sewage pumping station and periodic meetings with the concerned municipal staff.
- Identification of the sewage pumping stations needs in terms of electromechanical spare parts.
- Manage the implementation of the electromechanical repair and maintenance works
- Construction of a sewage pumping station in the Northern Area WWTP to pump the treated wastewater from the existing lake to the infiltration basins.
- Supply of sewage networks materials to the municipalities to maintain the damages repair works which resulted from the frequent Israeli incursions to Gaza strip cities.

8.2. Improving Wastewater Quality :

- Monitor and supervise the daily operation of the existing three wastewater treatment plants.
- Monitor and supervise the wastewater laboratory activities .All the laboratory consumables and instruments needed were procured. Calibration of the laboratory instrument and the testing method are carried out periodically.
- Supervise the routine maintenance activities and provide the needed technical assistance during the periodic visits and meetings.
- Identify the treatment plants needs for maintenance works and procure the maintenance works and supervise the process in general.
- Procurement of the operation and maintenance materials and equipments of the treatment plants (spare parts, consumables, chemicals, etc.)
- Plan and manage the upgrading and maintenance projects for the WWTPs.
- Electromechanical upgrading of Gaza Area and Northern Area WWTPs.

Summary of Achievement

Definition Electromechanical Operational Ratio = $\sum a_i \times (R_{ti} / M_{ti})$ where, **(ai)** is the weight factor of each equipment, the maximum value of (ai) is one, **(Rti)** is the actual running hours of the equipment measured with hour meters **(Mti)** is the maximal time required by the process. This figure will be a result of our report on theoretical treatment capacities of the three existing treatment plants.

Targets:

- Implementing a quality-monitoring program for the three existing treatment plant.
- Supply the needed chemicals for the implementation of the monitoring program.
- Reducing the BOD, COD and TSS in the three existing treatment works and achieve an overall composite target of 97%

Justification operational monthly report and maintenance contracts

Executive Summary:

Many repair, maintenance and rehabilitation projects have been identified and launched in order to enhance functionality of the wastewater facilities; where more than USD 2m were invested for this important target (see details in the financial achievement)

As a result, the overall electromechanical operation ratio is **89.5 %** (the target in the SIP was **89.6%**)

and the overall wastewater improving quality composite achievement is **93.5%**.

9. Develop and Update Customer database

This task was developed in order to give P.W.A a crucial tool to face the future challenge of creating the Coastal Municipalities Water Utility (CMWU). The absence of a unified and homogeneous computerized customer database was always a great concern for PWA, as any operator of the water sector in the future will need such a database.

In the general circumstances which revealed during the past 3 years in Palestine and the risk of sudden collapse of the water and wastewater services systems; this made it even more critical to have a computerized customer data base of the water and wastewater customers.

During the original SIP project (executed by LEKA), the core of the computerized customer database was created under Oracle environment (report is provided). The core of this database was created through bulk manual data entry of all customer records and their basic data. Manual data entry was used in the absence of technical solution to transfer the data from the old municipal systems electronically.

As for the task under the current emergency extension, it was limited to the continuous update of the customer data base using the same format of reporting.

It is worth mentioning that not all municipalities submit new customers report every month as some of them do not have new customers in some particular months, and others would prefer to report the new customers in one list that would consist of new customer who subscribed to the water and wastewater services several months prior.

Summary of achievement:

Definition Update and maintain oracle customer database based on the delivered new customers from the municipalities
Operate and support of X7 system in the pilot area municipalities.

Justification Updating customers' database according to lists submitted by the municipalities.
Monthly report of delivering meter reading lists and bills

Executive Summary

The total number of water and wastewater customers in the database has reached 103,337 customers by the end of October 2004. This number does not include the customers of the new small village councils.

10. Maintenance and other activities

During the implementation of the SIP extension and the IEP, and based on various municipal enquiries and the occurrence of emergency malfunctioning events, several projects and orders of electrical and mechanical repair ,refurbishment , upgrading and construction works have been prepared and carried out and supervised. Purpose was technically assessed and made to safe and secure the municipal water and wastewater services installations and equipment against any malfunctioning and stoppage events keeping

sustainable services and preventing any serious deterioration of plants and equipment.

Due to the political conditions in the Palestinian Territories, most of the municipalities suffer of financial constraints. Therefore, the municipal requisitions for emergency refurbishment and repairs were abnormally increased where the municipalities have shortage of financial resources and skilled labors and technicians to deal with specialized sorts of faults events.

The following summary of refurbishment and repairs contracts and orders were placed and carried out under the supervision of the PMU of PWA .It covers various types of works, which have been implemented for electrical and mechanical installations located at the municipal water plants and equipment.

1. Refurbishment and overhauling standby power supply diesel generators
2. Mechanical Upgrading and refurbishment for pumping sets -water production wells.
3. Electrical refurbishment and repairs of electrical control switch boards
4. Supply and installation complete electrical drive motors for water wells
5. Procure and supply critical electrical and mechanical spare parts and equipment
6. Supply and install complete new pumping sets for water production wells.
7. Procure, supply and installation of all chlorine dosing equipment with all associated spare parts and consumables which are essentially required to verify and secured water disinfection task through out the municipal water distribution networks .
8. Arrange for all required repairs and maintenance of chlorine dosing equipment located at various municipal water production installations and essentially required to maintain water disinfection through out water distribution networks.
9. Comprehensive renovation and refurbishment maintenance works of 1000M3/hour brackish water desalination plant located at Deir Al Balah municipality.
10. Supply to PWA stores critical electrical and mechanical spare parts and materials required for periodic repairs and maintenance of the municipal water plant equipments and installations.
11. Electrical and mechanical refurbishment and upgrading of Rafah main water booster station and Bani-Suhaila regional water booster station.
12. Electrical and mechanical upgrading of New water well L173 at Al Qarara municipality.

WEST BANK AND GAZA

- SELECTED CITIES AND TOWNS
- RIVERS
- MAIN ROADS
- RAILROADS
- ARMISTICE DEMARCATION LINES, 1949
- NO-MAN'S LAND AREAS, ARMISTICE DEMARCATION LINE, 1949
- JERUSALEM CITY LIMIT, UNILATERALLY EXPANDED BY ISRAEL JUNE 1967; THEN ANNEXED JULY 30, 1980
- GOVERNORATE BOUNDARIES
- - - INTERNATIONAL BOUNDARIES

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